### TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Bacteriology of Trachoma</td>
<td>887</td>
</tr>
<tr>
<td>Treatment of Tuberculosis of Knee-Joint</td>
<td>891</td>
</tr>
<tr>
<td>Renal Infections: their Guises and Disguises</td>
<td>902</td>
</tr>
<tr>
<td>Hospital Stock Mixtures</td>
<td>915</td>
</tr>
<tr>
<td>Standard Pharmacological Formularies</td>
<td>925</td>
</tr>
<tr>
<td>Notes on Taenia Saginata in North China</td>
<td>932</td>
</tr>
<tr>
<td>Prevention of Disease in the Tropics</td>
<td>940</td>
</tr>
<tr>
<td>Investigation of Hookworm Disease in China</td>
<td>946</td>
</tr>
<tr>
<td>C.M.M.A. Executive Committee Report</td>
<td>947</td>
</tr>
<tr>
<td>Appeal of C.M.M.A. Research Committee</td>
<td>952</td>
</tr>
<tr>
<td>Hospital Reports</td>
<td>953</td>
</tr>
<tr>
<td>What is a Health Centre?</td>
<td>955</td>
</tr>
<tr>
<td>Current Medical Literature</td>
<td>969</td>
</tr>
<tr>
<td>C.M.M.A. Canton Branch, Meeting of</td>
<td>965</td>
</tr>
<tr>
<td>Book Reviews</td>
<td>975</td>
</tr>
<tr>
<td>Correspondence</td>
<td>976</td>
</tr>
<tr>
<td>News and Comment</td>
<td>976</td>
</tr>
</tbody>
</table>

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Fig. 1.—Inclusion Bodies in Trachoma; Giemsa stain.

THE BACTERIOLOGY OF TRACHOMA. (Smith).
THE BACTERIOLOGY OF TRACHOMA*

D. V. Smith, M. D., Peking.

The subject of trachoma is an old one, yet it is also ever new; old, because of our long acquaintance and familiarity with its clinical manifestations and the treatment thereof; new, because its exact etiology is still unknown and the lure of solving its mystery proves as enticing to many painstaking investigators of today as was the desire of the ancients to discover the Fountain of Youth. My excuse for bringing this subject before you is that while we have all heard about the so-called "trachoma bodies", only a few perhaps have seen them and our familiarity with them is much less than our acquaintance with the appearance of the Koch-Weeks bacillus or the gonococcus.

In the study of the etiology of trachoma, almost every known organism among the bacteria and protozoa has at some time or another been incriminated by this or that observer as the causal factor. That good authority, MacCallan, of Egypt, said in 1914, "In few other infectious diseases has the etiologic agent been ascribed to so many different micro-organisms by different investigators. At the present time, however, consideration need only be given to Prowazek's cell inclusions and to Lindner's initial bodies." The work of these men was cut short by the war and as far as I know not much advance has been made since. While in Vienna, it was my privilege to hear Professor Lindner express his ideas regarding trachoma and I am glad to impart, in a very brief and inadequate fashion, some of his theories.

Many observers in studying trachoma have found peculiar granules or "inclusions" in the conjunctival epithelial cells. These so-called "trachoma bodies" have been variously described

*Read before the Section on Ophthalmology at the Biennial Conference of the C. M. M. A., held in Shanghai, February, 1923.
and interpreted by different workers. Prowazek described them as dark blue, granular inclusions in the protoplasm of epithelial cells when trachoma smears are stained by the Giemsa method. At first small, round, or oval, they apparently grow, become less dark and then fine red points appear in the masses. As these red points increase rapidly in number, the blue masses gradually disappear. Prowazek called the blue masses "plastin" because he thought them to be a reaction product of the virus upon the cells. To him the red points were the virus, and were found extracellularly as well as intracellularly.

Lindner, working with a special contrast stain, and using wet fixation as well as fixation and section of the conjunctiva in paraffin, secured a different picture from the ordinary dry smear methods used before. He found blue, sharply outlined, round, cocci-like bodies in the cavities of the protoplasm of the epithelial cells. These granules, which correspond to the "plastin" of Prowazek, were called "initial bodies" by Lindner. In the first days of a trachoma infection the inclusions are small, but in a few days grow larger showing fine red points which he called "elementary bodies." As these bodies enlarge and grow more numerous, the fine chromatin network of the nucleus almost disappears as it is pushed to one side, and almost the whole cell is filled with blue and red bodies as shown by the Giemsa stain.

The blue initial bodies are the more delicate and are found mostly about the periphery of the cell cavity and also extracellularly. They must be a living substance as they divide and multiply, although in a different manner from ordinary germs. Thus one finds a granule, or a circular form, or a bipolar form, or a figure-of-eight shaped form, or crescents, etc., as shown in the accompanying photomicrographs.

In the ordinary smear, the free initial bodies are so small that they clump together and cannot be found or else are washed away. The fine red points, or elementary bodies, are probably degenerated products of the virus, since the initial bodies are found at the periphery of the cell cavity while the red elementary bodies are found only in the center where the nutrition is poorer. The elementary bodies are more resistant than are the initial bodies and may be analogous to the spores of bacteria. Lindner was not able to cultivate the initial bodies, but Noguchi in New York has lately
Fig. 2.—Inclusion Bodies in Trachoma; Contrast stain.

THE BACTERIOLOGY OF TRACHOMA. (Smith).
Fig. 3.—Initial Bodies in Trachoma.

THE BACTERIOLOGY OF TRACHOMA. (Smith).
claimed to have done so. So much for a brief résumé of the appearance of the "trachoma bodies", or "inclusions bodies". What has been the result of their discovery and what is their significance?

Epithelial cell inclusions have been found by various observers in other diseases of the eye, notably in ophthalmia neonatorum. In 1909, Stargard noticed that these never occurred in connection with the gonococcus and that non-gonorrheal cases had a much milder course, beginning from the fifth to the twelfth day after birth with no corneal complications resulting. Inoculation of the baboon with this type of infection caused a severe conjunctivitis from which these same bodies were recovered. The same disease was also produced on the genitalia of the baboon. Further investigations showed that these same cell inclusions were to be found in non-gonorrheal urethritis and vaginitis. These studies gave rise to the terms "inclusion blennorrhoea," "inclusion urethritis," etc.

Lindner proved that in many cases of non-gonorrhoeal blennorrhoea, the inclusions found in the child's conjunctiva could also be recovered from the genitalia of the mother. One experiment was very interesting. He found in a series of one hundred pregnant mothers with vaginitis that about 60 showed gonococci, 30 showed inclusions, and the remaining 10 showed both gonococci and inclusions. If their children when born were untreated by the Credè method, about 70 children would have a gonorrhoeal ophthalmia and about 30 would have an inclusion blennorrhoea. If in another series the children were all treated with the Credè method, there would be no cases of gonorrhoeal ophthalmia, but there would be about 40 cases of inclusion blennorrhoea developing later than the usual gonorrhoeal blennorrhoea and having a milder course, not affecting the sight, although the ultimate cure was quite prolonged and there was scar tissue formation. This showed that the Credè method is specific against the gonococcus but does not act against the inclusion blennorrhoea.

A further proof of this difference is seen in the fact that the baboon is entirely immune to infection by the gonococcus, but is susceptible to both trachoma and the inclusion disease. This shows that the inclusions are not involution forms of the gonococcus as some have claimed.
Some of the older writers asserted that gonorrhoea of the eye and trachoma were the same disease. Some credence might naturally have been given to this when it was recalled that cases of purulent conjunctivitis which, when nearly free from the gonococcus, have developed a papillary hypertrophy very closely simulating trachoma, even to the formation of pannus. Why should some cases have this marked papillary hypertrophy and others be entirely free from it? Is it not because there has been a mixed infection and just as the gonococcus was about to leave, the inclusion disease or trachoma began to manifest itself?

By the experiments above referred to, it is shown conclusively that children and adults may have an infection of the eyes or of the genitalia either by the gonococcus or by the inclusion disease or by a mixture of the two. The inclusion disease in the eyes produces scar tissue formation just as does trachoma; the gonococcus produces no scarring in the eyes. May it not be that the stricture which sometimes follows an urethritis in the adult is due not to the gonococcus, but to either a mixed or a pure infection in which the inclusion disease was active in producing the cicatricial changes?

Lindner holds that this inclusion disease is analogous with, or the same as, trachoma. At first thought we smile at the idea of trachoma being a genital infection, but why may it not be? The gonococcus and the diphtheria bacillus thrive both in the eye and in the genital tract, so why is it not possible for the germ of trachoma to do the same?

If this inclusion virus is the same as trachoma, then we should find trachoma in young children. Lindner points out that this is very hard to diagnose, but that both old and young may have it. However, in babies trachoma has a very mild course and does not produce papillary hypertrophy or follicles since the child’s conjunctiva is very poorly provided with lymphoid tissue. Nevertheless, if a child has a thickening of the conjunctiva which lasts more than several months, it must be trachoma. That trachoma and inclusion disease are one and the same is further shown by the experiment of an oculist in Berlin who infected with inclusion bodies the eyes of two patients whose corneas had been previously destroyed by other disease and a typical trachoma resulted.
Fig. 4.—Initial Bodies in Blenorrhoea.

THE BACTERIOLOGY OF TRACHOMA. (Smith).
Treatment in China of Tuberculosis of Knee Joint. 891

In a recent case of acute trachoma the inclusions may be found all over the conjunctiva just as bacteria are found in the epithelium. The best place to find them is the upper cul-de-sac. These inclusions are not found in folliculosis. In trachoma one examination is often not sufficient, for the bodies are hard to stain and to find. One negative result in a suspected trachoma is not dependable, but one positive result is sure evidence of trachoma.

TREATMENT IN CHINA OF TUBERCULOSIS OF THE KNEE JOINT.

ThORNTON STEARNS, M.D., Shantung University Hospital, Tsinan.

The treatment of joint tuberculosis so as to eradicate the disease and at the same time obtain a satisfactory functional result is one of our hardest surgical problems. At present this is especially true in China because most of our patients come for treatment only in the advanced stage of the disease; other difficulties arise from the poor economic condition of the people, the scarcity of hospital beds, the absence of social service to assist financially and of visiting nurses to do follow-up work, and the lack of convalescent homes. In most cases the problem is to give the patient a functional result that will enable him to earn his living and that as soon as possible.

In this paper the treatment of tuberculosis of the knee only will be considered. The end result to hope and strive for is a bony ankylosis. This may be obtained by conservative means requiring an extensive period of time, or by surgical treatment requiring a much shorter time. One of the drawbacks to conservative treatment, besides the length of time necessary, is the uncertainty of obtaining a bony ankylosis. In the case of a working man, if a fibrous ankylosis takes place the functional result is not satisfactory because of the slight abnormal motion and the pain caused by adhesions, so that often a resection of the joint must be done in the end.

Resection of the knee joint for tuberculosis is an old, tried, and satisfactory method of treatment in the West in certain definite conditions. In China, for the reasons given, conditions
are different, therefore the treatment cannot be always the same. It is from this point of view that we present the subject.

Tuberculosis of the knee may be divided into three stages: the early, the intermediate, and the advanced.

The early stage. —Before marked synovial or joint changes have taken place the diagnosis and treatment of tuberculosis of the knee joint is usually very difficult. There is so often a history of injury that one is inclined to look upon the process as merely a chronic traumatic arthritis. But if gonorrheal urethritis and syphilitic infection can be excluded we should be very suspicious of tuberculosis. A hypodermic tuberculin diagnostic test, and, if there is fluid, aspiration of the joint and injection of the fluid into a guinea-pig, should be done.

If the diagnosis can be made positively, what is the treatment of these early cases? The question is difficult because the temptation is to be conservative when perhaps the treatment should be radical. It is necessary to consider the economic and social condition of the patient and to remember the limited bed-space at our disposal. In all but well-to-do adults, if there is no active pulmonary disease we believe that resection of the joint should be performed as soon as the diagnosis is made. In patients who live in good home conditions and who are able to afford an indefinite period of rest, we should try conservative treatment (a cast or Thomas splint) as long as there appears to be no progression of the disease. After a reasonable time, say nine months or a year, if there is no improvement, or if there is evident progression of the process, resection of the joint seems to us clearly indicated. Even in adults of good economic condition it is a grave question whether resection of the joint should not be performed as soon as the diagnosis is made. In children conservative treatment is recommended until there are signs that the general condition is getting worse.

Intermediate stage.—In a knee joint with marked synovial thickening, moderate limitation of motion, a history of remissions extending over months or possibly a couple of years, the picture is typical and the diagnosis fairly simple, even though no joint changes are evident by X-ray examination. However, there is a monolateral syphilitic synovitis, probably the beginning of a
Charcot's joint, which clinically may be taken for tuberculosis of the knee in the early or intermediate stage. We have encountered two such cases. In each the synovial thickening and the limitation of motion were less than in the tuberculous form; there was no evidence of fluid within the joint, and the positive Wassermann confirmed the diagnosis of syphilitic synovitis. In the intermediate stage of tubercular infection, no matter what the economic or social condition of the patient may be, where the pulmonary condition is good we believe that prompt resection is the proper treatment. In children, whose home conditions are good, a period of a few months of conservation treatment under close observation should be given a trial. Where the home conditions are poor resection should be done. We believe that moderately advanced cases go from bad to worse; therefore the quicker the joint is resected the better.

Advanced stage.—This is the type of disease of the knee joint which we see most frequently in China, and from the point of view of treatment it presents the greatest problem. The intermediate and advanced stages more or less merge into one another; the border line is not sharply defined. But there are some advanced cases, such as those with sinuses, which do not leave us in any doubt as to their classification. These cases usually are of long duration and the patients come to the hospital only as a last resort. Judging by our experience in one case with sinus (Case No. 5045) in which the general condition was excellent and resection was followed by a fairly good result, we feel encouraged and willing to try radical treatment in all advanced cases with sinuses. We realize the seriousness of resection where there is a sinus as it means that a secondary infection is present. But if resection had not been done in the case mentioned, it would have been a question of amputation, or a long period of rest in the hospital with the indefinite hope that the sinus would heal, and after all perhaps the necessity of resection. Certainly there was a greater risk, but the operation gave the patient a good leg and within a reasonable length of time. However, resection in this type of case needs more extensive trial before it can be generally advocated. Where the method of morticing the two bones is used, and no foreign body such as a plate is inserted, and a good application of the cast is made, the danger is less than in the case referred to, in which a steel plate was used to unite the bones.
In resection there is always the risk that a severe local infection may occur with complete breaking down of the wound; but with careful treatment, if the general condition of the patient is good, the infection will subside and granulation tissue grow up. Where there is separation of the skin edges by healthy granulation tissue which has reached the level of the skin, pin-point skin grafts will hasten the wound closure. If the general condition is not good, if there is pulmonary tuberculosis even mild in form, amputation is the method of choice. In children the same principles hold as in adults, but when the general condition is not good we advise a few months’ general treatment to see if there will be improvement; if not, then a resection may be tried. After six months’ hospital treatment if there is no general improvement then an amputation should be performed. It should be done earlier if there are any signs of the patient losing ground. These principles of treatment may seem somewhat radical as compared with those of the West, but the different economic conditions which prevail in China and the scarcity of hospital beds must be most carefully considered. During his visit to China in the spring of 1922, Dr. E. G. Brackett, of Boston, came to the conclusion that in the East we must resort to more radical measures just because of these two conditions—the need for the patient to be early restored to his wage earning capacity, and the very limited hospital accommodation for such cases.

Operative Procedure.

In all cases the leg to be operated upon is prepared for two successive days. A horse-shoe incision is made, convexity downward; the flap of skin and superficial fascia dissected upward; patella removed; the joint thoroughly exposed; the synovial membrane with the tubercular granulation tissue removed in great measure, but no attempt made to dissect it all away; slices as thin as can be sawed are removed from the tibia and femur, the pieces being cut so that an angle of about twenty-five degrees from full extension is formed when the bony surfaces are held in contact. In six cases holes were bored slantingly on each side through the two bones and heavy kangaroo tendons threaded through and tied. In one case an intramedullary bone graft was placed uniting the two bones firmly. In another case thin slices were sawed from the condyles and chiselled from the head of the tibia, leaving a wedge which fitted snugly...
Treatment in China of Tuberculosis of Knee Joint.

into a notch cut between the condyles. An angle of twenty-five degrees from full extension was easily maintained on account of the snugness with which the wedge and notch fitted into each other. This is the mortice method. After the wound is sutured, a plaster-of-Paris cast is applied extending high on the thigh and including the foot. A hole is cut, through which to observe the wound.

Case Histories.

Case No. 5054.—Patient, a farmer's wife. Aged 43. 'A history of disease of seven years' duration. No injury that the patient remembers. There is pain and disability with remissions and recurrences. For the past year she has not been able to walk without a support. Two months before admission a sinus formed.

Examination.—There is marked limitation of motion; capsular thickening; immovable patella; a sinus on the inner side of the head of tibia with moderate discharge.

Operation.—Resection with plating. Large amount of tubercular granulation tissue present. There was a complete breaking down of the wound, due to the secondary infection which had already occurred. Infection subsided and wound gradually granulated up; later the plate was removed. Seven months after operation there was still fibrous union only. Patient left the hospital 8½ months after the operation when bony union was still not quite complete; the sinuses had almost completely healed. The angle of flexion was a little greater than desirable. With a cast the patient has been walking in the wards for four weeks. A letter received from the patient 2½ years after operation, states that the wound is completely healed, that there is no pain, and that she walks without difficulty but finds it "inconvenient to work."

Case No. 933.—Female, aged 14 years. History of a fall injuring the right knee, two years before coming to hospital. Since then there has been pain off and on, and periods when she could not walk. Again there would be times when she was fairly comfortable but always with a certain amount of disability. For the last six months she has hardly been able to get about at all. At present the condition is very acute.

Examination.—Spindle-shaped swelling of the right knee. Thickening and tenseness of the capsule. Fixation of the patella, tenderness of the joint. Unable to completely extend the leg; flexion only to one hundred degrees. Disease very advanced.

Operation.—Resection. Much thickening of the synovial membrane with typical tuberculous granulation tissue. A wedge was left on the tibia and a notch made in the femur into which the wedge on the tibia was fitted snugly. On account of the snugness with which the two bones fitted into each other the leg was easily maintained in the position into
which it was put, which was at an angle of twenty-five degrees of flexion. No sinuses formed. Four months after coming to the hospital, or two months after the operation, the patient came to the Out-patient Department wearing the cast which had been put on at time of operation. The local condition was good, as seen through the opening made into the cast soon after it was applied, and the general condition of the patient was much better than at the time of operation. This case was seen and operated upon by Dr. E. G. Brackett during his visit to Tsinan, April, 1922.

Case No. 3856—Male. Aged 25. Farmer. Three years ago patient fell into a pit, spraining his left knee. The injury was very severe; he could not bend the knee and for four months was not able to work. After another four months the pain returned, and has been present off and on to some extent ever since, incapacitating him. He says that he can bend the knee only to a right angle.

Examination.—Thickening of the capsule; fluid in the joint; crepitus. Patella movement not free. Flexion of leg only to a right angle; full extension.

Operation.—Resection. Plating. Sinuses formed. Later the plates were removed. Synovial membrane lined with typical tuberculous granulation tissue. Microscopic examination showed tuberculous tissue. Patient in the hospital two months and five days. Sinuses had not healed when discharged. Four months after operation when the patient was seen, the sinuses had healed and there was firm bony union. In a letter received three years and seven months after operation, the patient stated that he was pleased with the result, and that he could carry 130 pounds without difficulty.

Case No. A. 760.—Patient, a farmer's wife. Aged 41. States that for six years there has been pain in the right knee; has been able to be about but much inconvenienced. During the past two years the pain has been a little less, but patient is not able to walk.

Examination.—Swelling of the knee; thickening of the capsule; flexion of the leg and not able to fully extend it; atrophy of leg; tenderness of knee and hot to the touch. Marked limitation of motion.

Operation.—Resection. An intramedullary bone graft placed in the tibia and femur; kangaroo tendon sutures also placed. There was erosion of the cartilages of both bones. No sinuses formed. Patient in the hospital two months and ten days. Eight months later the patient was heard from; said she was in good general health and the leg gave her no trouble.

Case No. A. 952.—Male. Aged 18. Student. For two years there had been pain and swelling of left knee. No history of injury. Not able to walk. One year later there was a more severe recurrence. Patient was a little better for a while but still not able to walk.
Treatment in China of Tuberculosis of Knee Joint.

Examination.—Swelling of the knee; thickening of the capsule. The circumference of the left knee was one and a half inches greater than that of the right. The calf is one inch less in diameter than that of the right leg. Extension limited slightly; flexion to 120 degrees only.

Operation.—Resection. Much tubercular granulation tissue. Kangaroo tendon sutures. Sinus formed. No abscess of bone. Small sinus upon discharge; firm bony union. In hospital six months. Upon leaving, general condition good and the patient had gained in weight. A letter sent to him recently was returned as his home was so far away from the post office that it could not be delivered.

Case No. A. 1137.—Male, aged 21. Farmer. Patient remembers that four years ago after carrying a very heavy burden there was pain in the right knee on the following day; three months later it swelled; the pain was so severe that he was not able to walk. He first came to this hospital eighteen months ago when the diagnosis of chronic arthritis was made and conservative treatment used; no improvement.

Examination.—Swelling of the knee; marked limitation of motion; thickening of the capsule; immovable patella.

Operation.—Resection. An average amount of tubercular granulation tissue lined the synovial membrane. Kangaroo tendon sutures used. A sinus formed which eventually completely healed. Upon discharge there was firm bony union. No reply to letter of inquiry.

Case No. B. 258.—Male. Farmer. Aged 23. Duration of symptoms ten months. Pain in right knee; no known cause; pain has gradually increased. Seven months ago there was a decided increase but patient was still able to walk.

Examination.—Swelling and redness of the joint; no excess of fluid; full extension; flexion only to a right angle.

Operation.—Resection. Much granulation tissue. Microscopical examination showed it was typically tubercular. Kangaroo tendon to unite the bones. No sinuses developed. Bony union complete when patient was discharged. In hospital six weeks; general condition good. No reply received to the letter sent to him.

Case No. 3704.—Male. Student. Aged 27. Pain in the right knee for four years. It has gradually increased in severity but with remissions. During this time he had been able to work as a dispenser. Later, the pain became so severe that he had to give up his work. For many months the knee was treated as tuberculous, a cast being applied. The swelling has gradually increased.

Examination.—At present there is marked swelling, and the leg has a spindle-shaped appearance. There is a certain amount of fluctuation, with
marked limitation of motion, great pain on attempting to move the leg, marked thickening of the capsule. The skin has a tense appearance as if it were about to burst open.

Operation.—There was a quantity of tubercular pus. The synovial membrane was lined with typical tubercular granulation tissue. Very little of this tubercular tissue was removed. Bones were united by a plate. Sinuses formed. Later, the plate was removed. Upon discharge from the hospital six months after the operation the sinuses had not completely healed and there was still only fibrous union. The history of the case was followed closely. Eventually the sinuses closed and bony union took place. At present, four years after the operation, the patient has no pain, and though he has a slight limp he is able to walk a long distance. He has just been examined and is in excellent condition. The sinuses healed a short time after leaving the hospital.

Case No. 3975. Male. Farmer. Four years ago sprained the left knee. Although there was pain the patient was able to work. After two years he was not able to use a carrying pole but he could do light work. A month before admission the pain was more severe. There was pain upon getting out of bed.

Examination.—The circumference of the left knee was one inch greater than that of the right. Slight swelling of the capsule. Contraction of the knee, also atrophy. Active motion limited to a range of 60 degrees.

Operation.—Resection of the joint. A large hole was found in the head of the tibia, filled with caseous material. Plating. Sinuses formed. Plate removed three months after insertion. Bony union upon patient's discharge from hospital three months after operation. Four months after operation there was firm bony union and all sinuses had healed. Six months after operation word came that the patient was able to work. A year later was in good condition and working.

Case No. 5250. Patient a housewife. Aged 28. One year ago her knee was struck while walking, a swelling appeared, and there has been difficulty in walking ever since. During the last six months the pain has been very severe.

Examination.—Thickening of the capsule. Patella immovable. Marked limitation of motion; flexion only to 85 degrees.

Operation.—Resection of joint. Plating. Sinuses formed. Plate removed. The synovial membrane was lined with typical tuberculous granulation tissue. The patient was discharged after five months when there was bony union and the sinuses had healed. The patient was seen two years after operation; her general condition was then good and she was walking with only a slight limp. There is flexion of 25 degrees.
Treatment in China of Tuberculosis of Knee Joint. 899

Case No. B. 747.—Male. Farmer. Aged 26. Six years ago, without any history of injury, the right knee suddenly swelled. There was pain which increased on walking. However he was still able to work. The swelling persisted but the pain went away. Seven months ago there was sudden severe pain which lasted only a few days; a month later, while riding a donkey, without any known cause the pain suddenly became very severe so that he was not able to walk.

Examination.—The right knee spindle-shaped; extension normal; flexion limited. Marked thickening of the capsule. The circumference 1½ inches greater than that of the left knee. Patella less mobile.

Operation.—Resection. Bones joined with kangaroo tendon sutures. A sinus formed which had almost completely healed at time of leaving the hospital. At operation the joint had the characteristic tubercular granulation tissue in great abundance. The patient was in hospital two months and twenty-three days. In reply to a letter sent to him, he stated that the sinus still remained. This was a year and a half after the operation.

Case No. B. 547.—Male. Aged 7 years. At the age of two years the left knee was sprained and at the time the child cried hard. On the second day the pain was more severe, there was swelling, and much pain when the child walked. At times the condition has seemed almost to disappear entirely only to recur again. Lameness almost constant.

Examination.—At present there is lameness, swelling of the knee, thickening of the capsule, limitation of motion, with thirty degrees short of full extension; flexion only to one hundred degrees. There is marked displacement of the patella backwards. A plaster cast was applied and the child sent home and parents directed to report in six months. On his return at the end of this period the swelling had increased, there was more fluid and there were signs of the joint breaking down.

Operation.—Resection. Typical tubercular fluid and with granulation tissue lining the synovial membrane; caseous material present; cartilages involved; erosion. Bones united with kangaroo tendon sutures. Sinuses formed. A pyocyaneous infection occurred. After fifteen months there was only fibrous union. Patient still in hospital. General condition excellent. Walks about the ward wearing a cast.

Case No. B. 458.—Farmer's wife. Aged 21. For two years the patient has had pain in the left knee. Onset was gradual and she thinks the pain has relation to movement. No injury that she is aware of. Has been able to walk freely up to three months ago, then there came on much discomfort, pain, and swelling; the swelling has gradually subsided.

Examination.—There is slight backward dislocation of the tibia; marked limitation of motion; slight flexion; thickening of the capsule;
immobilisation of the patella; no free fluid; flexion of the knee only to 140 degrees; extension not complete.

**Operation.**—Resection. Typical tubercular granulation tissue lining the synovial membranes. Cartilages eroded. Bones united with kangaroo tendon sutures. Sinuses formed. Nine months after the operation there was still only fibrous union; resection was done a second time, the ends of the bones freshened and a plate put in to unite the bones. Five months after the second operation there was almost complete bony union but the sinuses had not completely closed; they were very superficial, however. Patient able to walk about the wards with the cast on. In hospital fifteen months. Will shortly be discharged.

**Comment.**

In the four cases of plating where casts were changed before the patients left the hospital, there was bony union in three at the end of five months, and in one only fibrous union at the end of seven months.

In the five cases where only kangaroo tendon was used and the casts were changed before the patients left the hospital, there was bony union in three at the end of six months, and only fibrous union in two at the end of eight months.

Plates were used in five of the cases to stabilize the two bones; of course the plates were eventually all removed, local anaesthesia being used in some cases. Sinuses formed in all five. In six cases kangaroo sutures were used to hold the bones in close contact. In four of these sinuses formed; two cases remained free from the complication. In the case of the intramedullary bone graft and in the one where the mortice method was used there were no sinuses.

From these cases we see that when the bones were joined with kangaroo sutures fewer sinuses resulted, but longer time was required for bony union. A sinus always formed when plates were used but bony union occurred more quickly.

In one case in which kangaroo sutures were used there was still only fibrous union after ten months. A second operation was therefore performed, the ends of the bones were freshened and a plate put in to hold the bones in apposition.

As to resection in children we cannot be too careful about the epiphyses. Just enough cartilage should be removed to expose the underlying bone. If the disease is so extensive that the resec-
tion involves the epiphyseal line there will be arrest of growth and a short, useless limb. In these cases amputation is the method of choice.

**Summary of Cases.**

We have a record here of thirteen cases. In six, the time after operation ranging from four years to nine months, the patients are all well and the functional result is good. There are three patients from whom there has been no reply to the letters sent out. The immediate result of the operations and their general condition warrant the opinion that these patients are all well. One patient now under observation, whose general condition is good, has almost firm bony union so that the result promises to be favorable. One patient heard from reports complete healing and firm union, but she has some difficulty in doing her work. This is the case which had a sinus at time of resection. One patient, after only one year, reports sinuses, but this is not uncommon and if the general condition is good there is no reason why the sinuses should not soon heal. In one case now in the hospital there is not yet firm union after fifteen months, but we feel sure since his general condition is good that he will have it in time.

We thus have six positive cures, three probable cures, one case improved, two cases under observation with very favorable outlook, and one case at a distance still has sinuses, but there is certainly hope for a good result.

**Conclusions.**

1. In the case of adults in poor economic condition, if there is no pulmonary contra-indication, resect the joint as soon as a positive diagnosis is made.

2. In the early state in adults who are in good circumstances conservative treatment (a splint or a cast) may be used as long as there seems to be no progression of the disease; but even in these we are inclined to advise resection as soon as the diagnosis is made. In the early stage in children, when the economic and home conditions are good, give conservative treatment a trial. If there is no improvement after nine months or a year or if there is progression of the disease, and if there is no pulmonary contra-indication, then resect.
3. In adults if the general condition is poor or if there is an incipient pulmonary tubercular process, amputate above the knee.

4. In children if the general condition is poor, or if there is an incipient pulmonary tubercular process, try conservative treatment for about six months. If the general condition does not improve, then amputate.

5. When the general condition is good a sinus from the joint is not a contraindication to resection of the joint. We realize that resection is a radical measure and not without danger, but under good operative conditions it may be attempted in order to save the patient time, and to save hospital bed space. Conservative treatment gives no sure hope that the sinus will heal, and if it does heal resection will still be called for.

6. Morticing the two bones is the method of choice.

7. Joining the two bones with bone plates gives a quicker bony union than uniting the bones with kangaroo sutures through bored holes upon the two sides of the joint.

RENAL INFECTIONS: THEIR GUISES AND DISGUISES.*

HENRY W. S. WRIGHT, M.S., F.R.C.S., (Eng.) Tsianfu.

One of the most important steps forward that Medicine has made in the last few years is the realisation that the mucous membranes of the body, particularly the intestinal mucous membrane, are not the impermeable sheets of tissue we formerly thought them to be. Bacilli of various kinds are constantly entering the blood stream, either to be destroyed, to find a lodging place in some part of the body, or to be excreted by the kidneys. It is only when our general or local resistance is lowered by fatigue, cold, or other outside agency, or when from any cause we get an excessive dose of bacilli, that what we call disease results. Out of every hundred catheter specimens of urine taken from healthy people, no matter how careful the technique may be, ten will be found to contain organisms of one sort or another, generally the

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colon bacillus. The urine of a patient who has been constipated for three or four days will nearly always produce a growth of these organisms on culture.

Different organisms have their favorite sites for producing lesions, and Rosenow has shown that different strains of a particular organism will each find its own elective spot in which to settle down and multiply. For instance, streptococci seem to prefer the stomach, the gall bladder, or the appendix; and staphlococci frequently select the marrow of a long bone, or the renal cortex, as a point of attack. The colon bacillus, the commonest wanderer from its appointed path, finds that it can best make itself at home in the genito-urinary tract, particularly the pelvis and the straight tubules of the kidney; but it may also infect the prostate, the testicle, and more rarely the bladder wall where it may give rise to acute ulceration. In all these positions the results of the activities have something in common. An illness descends upon its victim with great suddenness. For the time being there is prostration with high fever, rigors and local pain. Under appropriate treatment the patient gets rapidly better, and is able to resume his normal occupation, and may be none the worse for his unpleasant experience. When the colon bacilli infect the pelvis of the kidney, the symptom complex called pyelitis is produced. My reason for bringing the subject before you is not that I have anything new to say about it, but because the condition is of great importance and of extremely frequent occurrence. It is, for instance, by far the commonest cause of haematuria, and, next to gonorrhea, it is the most frequent cause of pyuria. Clinically, it is very often unrecognized owing to incomplete investigation, the case being mistakenly regarded as influenza, cystitis, or chronic appendicitis.

Cases of haematogenous renal infection vary in severity, from those in which the kidney is riddled with small abscesses, the acute pyelonephritis of the text-books, to those in which it only acts as a filter for the excretion of large numbers of organisms with very little or no gross tissue reaction on its own part. For descriptive purposes these renal infections may be divided into four clinical types: the fulminating, the acute, the chronic type with relapses, and the cystitis type. These are well known, and will not be described at length.
The fulminating type prostrates the patient with dramatic rapidity, and his doctor is confronted with an abdominal catastrophe comparable to a perforated gastric ulcer or acute pancreatitis. The patient is seized with strangury, haematuria, high fever, and great pain in his loins. His temperature may range from 102° F. to 107° F. Rigors are nearly always present. On examination of the abdomen, an enlarged and exquisitely tender kidney is found, guarded by rigid muscles. The patient is obviously ill, and may look as if he were going to die. In this type of case it should always be remembered that symptoms referable to the bladder may be absent owing to the ureter being blocked by intense congestion.

Less severe than this type is the ordinary case catalogued as acute pyelitis. A patient who has usually been overtaxing his strength in some way or other for a good while, suddenly finds himself out of sorts, feels a pain in one or other loin, and has a temperature shooting up to 102° F.—104° F. He complains of frequency of urination, strangury, and perhaps haematuria. His urine is found to contain pus and colon bacilli, and very frequently he has rigors. For about a week his temperature is of the steeple type, and then under proper treatment it subsides, leaving him with some degree of pyuria which may or may not clear up later. The patient may never suffer from such an attack again, provided that the source of infection is recognised and adequately dealt with; or he may pass on into the chronic type with remissions. When this occurs he has a more or less chronic pyuria, but every now and again, particularly after any exertion, he notices a slight feeling of chilliness, or even has a rigor; this may be accompanied by frequency of urination, strangury, and haematuria, according to the severity of the attack.

Finally, patients are seen with very few general symptoms, yet their urine is hazy with colon bacilli, and every now and then they complain of urinary frequency.

Between these well marked clinical entities all kinds of gradations may be found, many of them often undiagnosed until stripped of their disguise by the cystoscope, the ureteric catheter, and the microscope.

Differential Diagnosis.

Influenza.—One of the commonest of these disguises is influenza. The patient, after feeling a little out of sorts, has a chill
and runs an abnormal temperature for a day or two. He may have very little renal tenderness and, at the beginning of the condition, no symptoms referable to the bladder, because the intense congestion has for the time being blocked the ureter. The renal pain is mistaken for the pain in the back characteristic of influenza, and the urine is not examined. Very frequently the temperature is uncharted, and so its characteristic form is not noticed. As a rule, microscopic examination of the urine should make the diagnosis clear. But there is one quite important and characteristic difference between influenza and pyelitis, and that is, the amount of prostration present in proportion to the temperature. In influenza a patient with a temperature of 103° F. is prostrate and miserable with considerable pain in the back. In pyelitis, the patient's tongue is often moist, and although at times his temperature may be 104° F. or more, he does not seem nearly as ill as would be expected if he had influenza. Further, in influenza the pulse rate is proportional to the temperature; in pyelitis, the temperature is higher than the corresponding pulse rate would indicate.

Malaria.—From malaria the differential diagnosis is easily made by the examination of the urine, and by the fact that the attacks, although they may recur, do not recur at regular intervals.

Cystitis.—All too often this ubiquitous disease of renal infection appears before us lightly concealed by the label, "cystitis." But with the introduction of a cystoscope it can be seen that the infection comes from the kidney, and then the condition is recognized in all its nakedness. The treatment of genito-urinary diseases will have advanced a long step forwards when it is realized by every physician that cystitis is far more often a symptom than a disease sui generis. As a matter of fact, primary cystitis is not very common, except after the passing of a septic catheter. Every case of chronic cystitis should be cystoscoped, and should have the ureters catheterized as a routine. If this is done, nearly always there will be found a primary infection of the kidney. Until this is cured the patient's symptoms will never be relieved. Occasionally after the renal infection has cleared up, a patch of cystitis can be seen with the cystoscope around the urethral orifice, and this maintains the frequent desire to urinate. The condition can be rapidly cured by the injection of half an ounce of silver nitrate solution (10 grains to the ounce) into the empty bladder, repeated once or twice at inter-
vals: of a week. It is the chronic cases which most often appear in this disguise. A little inquiry will nearly always reveal the fact that the patient occasionally has a slight bout of fever, during which the symptoms are intensified. It is also surprising how many women there are who will say, when a careful history is taken of their condition, that they think it quite normal to get up once or twice in the night to pass water, and add that they have done it for many years.

**Appendicitis.**—Another disguise often assumed by pyelitis is that of appendicitis. It is a widely spread notion that in acute appendicitis there is often frequency of urination due to the appendix becoming adherent to the bladder. I have never seen an appendix adherent to the bladder, but I have seen at least six cases of acute pyelitis operated upon for appendicitis, and in each case the appendix at operation was found to be normal. The frequency of micturition in these cases was due to acute pyelitis, and the mistake was made of regarding the renal tenderness and rigidity for that caused by acute appendicitis. Careful palpation, if necessary under an anaesthetic, will usually prevent this mistake, and it would seldom occur if the urine were properly examined in all cases. The confusion occurs more commonly in dealing with children than with adults. It must also be borne in mind that appendicitis and pyelitis may occur together, the infection coming to the kidney from the appendix which will, as a rule, be found to contain pus and to be acutely inflamed.

Chronic appendicitis may also keep up chronic pyelitis, by constantly allowing organisms to leak into the blood stream.

**Gonorrhoea.**—Another clinical disguise in which pyelitis sometimes appears is that of gonorrhoea. At the beginning of an attack of pyelitis the patient may complain of a urethral discharge accompanied by slight pain on micturition. A diagnosis of gonorrhoea is made. But the discharge on microscopical examination is found to contain *coliform bacilli* and not gonococci; it is not nearly so thick, yellow, and profuse as it is in gonorrhoea, and it rapidly clears up of its own accord, or after washing with mild antiseptics. Every urethral discharge should be microscopically examined as a routine procedure.

**Typhoid fever.**—Every now and again we find cases of pyelitis labelled typhoid fever. Considering the similar pathology of the
two diseases it is surprising that they are not more often confused. In each a dose of organisms from the blood stream causes a general febrile reaction and the organisms are excreted by the kidneys. It is the chronic relapsing type of pyelitis, with bacilluria and little pus, that may be mistaken for typhoid, particularly in localities where the services of an expert bacteriologist are not available. In disease of this kind the patient may be very weak from long renal sepsis, and may have an intermittent temperature. In pyelitis, however, the spleen is not enlarged and bacilluria appears early in the disease; in typhoid fever the headache is more intense and the fever is more regular in its course. Finally, a blood test will always enable a differential diagnosis to be made.

Other difficulties of diagnosis.—Once we are aware that pyelitis is protean in its manifestations and is always appearing in unexpected forms, its recognition is easy; the diagnosis depends on proper examination of the urine and subsequent cystoscopy. The discovery of the true nature of the disease will be a source of gratification both to the doctor and to the patient, as the former will in many cases be able to effect a cure, and the latter will be saved much inconvenience and discomfort. While discussing the difficulties of diagnosis it may be well to refer to two other rather uncommon clinical types of pyelitis, which should always be borne in mind. One is quite well known, the pyelitis of pregnancy. It is mentioned in order to point out that for its cure ureteric catheterisation is required; the premature termination of pregnancy is seldom necessary, and nephrectomy still less often. The other type, the pyelitis of marriage, is rare but important to recognize when present. The infection gets into the blood stream from the torn edges of the hymen recently ruptured by first intercourse. The patient has strangury, pyuria and an enlarged tender kidney. The importance of this condition, if renal pain is not well marked, lies in the possibility that the patient’s husband may be unjustifiably accused of giving his wife gonorrhoea. There are other conditions both intra-renal and extra-renal which have to be distinguished from pyelitis. These will not be considered in detail here, as the purpose of this paper is not to discuss differential diagnosis exhaustively, but mainly to indicate how easy it is for this disease to lie unrecognized under the many labels given to symptoms, like fever, whose origin has been inexactlly determined.
I have so far attempted to give sharp, clear-cut, clinical pictures of the commonest types of pyelitis as they are seen at the bedside, and to indicate how pyelitis, by neglecting a full consideration of the symptoms and a complete urinary examination, may easily be missed by a busy doctor and relegated to one or other of those scrap-heaps with which medicine abounds. With these clinical pictures in mind, perhaps it will be useful to give a little detailed consideration to individual symptoms.

**Symptoms of Pyelitis.**

Pain may be renal or vesical in origin, but it must be remembered that pyelitis may occur without any pain at all. Renal pain may be unilateral or bilateral, since one or both kidneys may be involved. Usually it is an intense, constant ache in the front and back of the loins. As a rule, it does not radiate along the ureter. Very occasionally, when clots are large enough, mild colicky pains are felt. In the chronic stages of the disease slight renal aching is sometimes present, felt in the angle between the last rib and the erector spinae muscle. It is common to many renal conditions and is due to some degree of blocking of the ureter. It is therefore of the greatest significance as it indicates destruction of the kidney substance from back pressure. Any case presenting this symptom should at once receive the fullest investigation by all the methods available. The condition is frequently neglected by doctor and patient alike, as it may cause very little inconvenience. It is time that we should not be so often compelled to operate on the kidney for the end results of morbid processes. There is no reason why nephrectomy should not become a rare operation, only performed for growths and acute diseases which threaten life.

If the pain is vesical it occurs at the end of micturition, and is referred to the tip of the urethra. It is usually intense, lasts a few minutes, and is associated with frequency of urination or the constant desire to pass water. Sometimes blood may appear with the last drops of urine passed. It cannot be too often said that this is a symptom more frequently of kidney than of bladder disease, as may be easily proven by the use of the cystoscope and ureteric catheter.

The second symptom, frequency of micturition, is a particularly characteristic sign of kidney disease, and can only be cured by dealing with the underlying renal condition. It occurs in eighty
per cent of all cases of pyelitis. In very acute cases it may be absent because of blocking of the ureter; it also occurs in patients with bacilluria. In some cases it may be so intense that the patient is practically incontinent.

Haematuria is a very common symptom. In fact, pyelitis is its commonest cause. It is not often associated with clots and colic, but it may be profuse enough to endanger life and to necessitate nephrectomy. In these cases the offending organism is often the gonococcus. Though the usual source of the effusion of blood is the kidney it may come from engorged veins in the bladder. When blood is present there is usually enough to colour the whole urine a bright red.

Bacilluria is another important sign of pyelitis. When present it is at once obvious on examination of the urine, which appears hazy and opalescent when the vessel is stirred. A drop examined under the microscope shows swarms of motile organisms. Pus is revealed microscopically and by the usual tests. Finally, culture will settle the nature of the infecting organisms. For this purpose, in the female, a catheter specimen should be obtained, but only once during an acute attack. In the male, however, while the acute stage is in progress a catheter should not be passed under any circumstances whatever, but a specimen suitable for bacteriological examination may be obtained in one of two ways: either ask the patient to pass water into two receptacles, one being a sterile culture tube; or, first wash the anterior urethra out with a pint of tap water, and then get him to micturate into a sterile glass pot. A point that requires mention in this connection is, that in many cases the odour of urine infected with the colon bacillus is neither foul nor fishy. On the other hand, if the fishy odour so often mentioned is present, it is practically pathognomonic of colon bacillus infection.

The reaction of the urine in acute pyelitis is always acid, and this is an important diagnostic point. It should also be remembered that urine which is quite clear may show large numbers of bacilli on culture. Therefore this culture test should never be neglected. Its use will throw light on many cases of unexplained fever. The cardinal symptoms just described—pyuria, haematuria, frequency of micturition and pain—may be present in many diseases of the

Renal Infections: their Guises and Disguises. 909
kidney, and of the bladder; it is when they are combined with an acute general infection and with fever of an intermittent type that we are justified in making the diagnosis of pyelitis.

**Etiology and Treatment.**

The etiology has so far been left out of consideration because it is intimately bound up with the efficient treatment of the condition. Both will now be considered together. Treatment can best be considered under three heads: treatment of the acute condition; that of the source of the infection; the treatment of whatever underlying renal condition may be present which has for the time being lowered the resistance of the kidney.

Treatment of the acute condition is in all cases the same. The patient should be put to bed and be at rest absolutely. While he has fever he should under no circumstances be allowed to get up, even to open his bowels. Care should be taken to protect him from chill. The avoidance of fatigue or effort is very important, because cold, over-work, undue exercise and worry are very important etiological factors. Dietetic and medicinal treatment may be summed up in the words, "water, and alkalies." Barley water, plain water, weak tea with milk, and sugar, may all be given, either by mouth or rectum. The patient must absorb large amounts of water for: a week at least, not less than five or six pints in twenty-four hours. The bowels should be kept well open. Potassium citrate should be given in 60 grain doses every two hours until the urine is alkaline, then every three hours, and finally every four hours. This treatment should be continued for ten days. Do not be persuaded in acute cases of pyelitis to give the patient hexamine (urotropin) or merely small doses of potassium citrate. Colon bacilli live in an acid medium and the way to get rid of them is to make their environment as alkaline as possible. Alkalinity does not actually kill them but seems to prevent their doing harm and to decrease their virulence. If the temperature fails to subside after a fortnight's thorough trial of the alkalisng treatment, it is wise to try the effect of changing the reaction of the urine once a week by alternately giving a citrate mixture and then one containing acid sodium phosphate to which hexamine may with profit be added. Failure to react to potassium citrate most often occurs in the so-called ascending pyelonephritis, in which the infection falls upon
a kidney already partly destroyed by back pressure. When the temperature has been normal for a few days and the patient is doing well hexamine may be given, but large quantities of water must still be administered for about three weeks after the beginning of the attack. In giving hexamine it is almost unnecessary to say that the urine should be made acid by the administration of acid sodium phosphate. Since hexamine rapidly decomposes it is best prescribed in tablets which are dissolved in the phosphate mixture just before each dose is taken. This treatment should be continued for about three months, even if the patient seems quite well. The chief use of hexamine in genito-urinary surgery is in preventing urinary infection rather than in curing it. It will seldom do any good in an acute infection, but it seems to inhibit the growth of organisms, and if given before operative interference it greatly reduces the virulence of any infection which may subsequently occur.

In acute fulminating cases the alkalising treatment should be tried for at least twenty-four hours before deciding to perform a nephrectomy. It will often bring down the infection to within quite manageable limits. If at the end of twenty-four hours the patient's condition still gives rise to anxiety the offending kidney should be removed. The treatment of the fulminating type of pyelonephritis which sometimes occurs after the injection of fluids into the renal pelvis for diagnostic or therapeutic purposes, perhaps should be an exception to the foregoing rule; but this condition is so rare that it is difficult to get certain evidence as to the value of non-operative treatment. Workers at the Mayo Clinic have brought forward evidence to show that these cases always require nephrectomy; therefore the earlier it is done the better because there is great danger to life.

During an acute attack of pyelitis or pyelonephritis no instrument of any kind should be passed, except when nephrectomy is contemplated, and then a cystoscope may be used to identify the kidney involved and to make certain that two kidneys are present.

Treatment of the relapsing and chronic types is neither so uniform nor so easy as that of the ordinary acute attacks. Moreover, it nearly always requires special instruments not possessed by most practitioners. To ascertain the source of the infection necessitates complete investigation of the condition of both
kidneys, and of the general condition of the patient. The renal
function should first be estimated. The test for blood urea and
the urea concentration test taken together are the best for this
purpose. In a young person who has had only one attack and who
clinically shows no signs of nitrogen retention, the test for blood
urea may not be really necessary, yet if facilities for performing it
are available it is well to do it. The next procedure is to get an
X-ray picture of the whole urinary tract and then to make a
cystoscopic examination. A few minutes before doing this, three
mils of a 0.4 per cent solution of indigocarmine may be injected
into a vein and its rate of appearance from the urethral orifices
noted, estimating the function of each kidney separately. Cystoscop­
copy will usually show which kidney is infected, but in the absence
of definite bladder signs catheterisation of the ureters may be
necessary to determine which kidney is at fault. After due
consideration, if it appears advisable, pyelography should be done so
that any abnormalities in the renal pelvis may be revealed. This
procedure is not entirely without danger, and it should not be
included in every case as a routine. With the information provided
by these investigations we are in a position to say whether there is
gross disease of the kidney or not. If present, it should be dealt
with suitably. Hydronephrosis, calculus, undue mobility, in fact
almost any morbid condition is capable of rendering the kidney
liable to infection, and it is useless trying to treat the disease on
general lines if one or more of these factors are present.

The diagnosis of gross disease being eliminated, if there is
still pyuria or frequency of micturition it is a very useful plan to
wash out the kidney pelvis with four mils of a five per cent solution
of colloid silver. This will cure a large number of long standing
chronic cases of renal infection, if repeated once or twice at intervals
of a week. It should be done in every case in which pyuria lasts
more than three weeks or a month, for though some cases may get
better without this treatment, in skilled hands it is almost without
danger and may cut short the attack by many weeks. Both kidneys
may be treated at the same sitting. It is needless to say lavage
should not be done during the acute stage. It is important that a
fresh solution of colloid silver be made up from the powder just
before use. Proprietary preparations are not so good. Failure
to observe this direction is responsible for much of the disrepute
Renal Infections: their Guises and Disguises.

into which this method of treatment has fallen. In addition, it is of the utmost importance so to regulate the patient's life as to avoid reinfection. Fatigue, over-work and exposure to cold are especially to be guarded against. Attention to the bowels is also very important. To correct constipation liquid paraffin is one of the most useful drugs we possess; combined with strychnine it is usually all that is necessary. If it be found that the patient's caecum lies at the bottom of the pelvis and that the ascending colon has a long mesentery, this condition should be corrected surgically if the bowel is the source of the infection. The method of coloplexy introduced by Waugh is a safe and successful procedure to attain this end. It relieves the stasis and consequent bacteriaemia, and prevents that drag of the hepatic flexure on the right kidney which may cause undue mobility, and a slight degree of hydronephrosis which is often one of the conditions predisposing to infection of this kidney.

A chronic appendix should always be removed if it is giving rise to any symptoms. The bowel is by far the most common source of sepsis in pyelitis, and if its abnormalities be successfully treated the patient will be saved months and often years of suffering. An inflamed gall-bladder may also be the primary cause of a renal infection, and if the patient be suffering from gall-bladder dyspepsia the offending organ should be surgically dealt with according to the conditions present. I am not advocating indiscriminate laparotomy for all these cases, but they must be energetically and radically treated as a patient has only two kidneys both of which may be infected, and he cannot afford to lose more renal tissue while he waits to see the effect of each succeeding physician's favorite drug. Intestinal antiseptics are very disappointing in their results. About the best of them is calomel, taken in doses of one tenth of a grain every hour up to one grain, for one, two or three days. After a short interval this treatment may be repeated.

Although the abdomen is the commonest source of the infection this may come from elsewhere. Therefore a rectal and urethral examination also should be made. In men, a urethral examination should never be omitted. In women, a vaginal examination should also be made as a cervicitis may be the original cause of the whole trouble; in fact this is not uncommon. Rectal examination may
reveal a prostatic abscess or an infected seminal vesicle. A urethral examination will exclude stricture. An obstruction causing renal back pressure should be promptly dealt with.

Another cause of pyelitis, common during the late war and possibly not rare in China, is the presence of chronic suppuration such as sometimes occurs in an old compound fracture. As the result of trauma to the old wound the barrier of new connective tissue around it is broken down, and the patient gets a dose of streptococci into his blood-stream which infects his kidneys. The use of a probe in wounds—an instrument which should be abolished—is often responsible for infection of this kind. With regard to pyorrhoea alveolaris, it is not a common cause of pyelitis but on general principles it should be treated if present.

Finally, it is necessary to say a little about vaccine treatment. On the whole this is disappointing, but it may be tried in obstinate cases when renal lavage has failed. The reaction after each dose is apt to be excessive; further, it sometimes gives rise to an intense local reaction which temporarily blocks the ureter and causes great pain. Occasionally it brings on a fulminating attack and the kidney has to be removed. As a general rule, a vaccine should never be used when the patient has any febrile reaction, because this is evidence that he is already successfully vaccinating himself. The dosage is very important, not more than 20 to 40 millions should be the initial dose; to give a dose of 100 to 400 millions may place the patient's life in danger, and anyway will do him no good. An autogenous vaccine should always be employed. Before giving vaccine treatment a complete examination should always be made. It is hardly necessary to say that it is useless to give a vaccine to a patient with calculi or hydronephrosis, or to one who is suffering from appendicitis, cholecystitis, or salpingitis, but attendance at the genito-urinary clinic of any Out-patient Department will reveal many such cases treated thus for months without adequate examination of the patients by special methods. Vaccine treatment will of course continue to be popular as it pays handsomely, and if the patient gets well he is apt to ascribe his recovery to this treatment, although 40 per cent of all cases get better whatever treatment is given. In the last few years the vaccine treatment has had a very
extensive and fair trial; unfortunately, it is very prone to prove a broken reed in just those obstinate cases where help is most wanted. Probably the reason for this is, there is some source of sepsis present which has neither been discovered nor treated with a view to its removal.

In conclusion, while it may be confessed that nothing new has been said in this paper, it is written in the hope that when we come across unexplained cases of bronchitis, orchitis, prostatitis, or pyelitis, we may remember that invasion of the blood stream by organisms from the bowel, or other foci, is not only possible but relatively common, and that an examination of the urine from this point of view will often clear up many obscure and troublesome symptoms and thus add one more score against the account of the Bacillus coli communis.

HOSPITAL STOCK MIXTURES.*


In our medical student days there was no question about the use of stock mixtures. They were in the great hospitals and always had been, and Mist. Potass. Citrat. c. Buchu, Haust. Domesticus Alba, and Mist. Expectorans bore a prestige of their own that no one thought of challenging. But with the rise of more modern methods of medication—hypodermic, intravenous, and especially medicines in the form of tablets and tablet triturates—a challenge has been very definitely thrown out and must be met. Are stock mixtures, and indeed all mixtures, simply a vestigial and obsolete relic of mediaeval medicine which still uselessly encumbers the enlightened practice of the up-to-date hospital clinic? Or have they still a legitimate and important place to fill amongst our modern therapeutic agents? If so, what are the principles and indications for their use?

Efficient Use of Stock Mixtures.

The problem naturally presents itself under several heads. The foremost is that of the intelligent use of these agents. Let us

*A paper read at the C.M.M.A. Conference, held in Shanghai, February 1923; Section on Pharmacology.
first briefly consider the unintelligent and mechanical abuse of stock mixtures which is all too common amidst the thronging duties and responsibilities of medical missionary doctors. This may be suspected when in any hospital pharmacopoeia we see a large number of mixtures named after the disease they are meant to relieve or cure, or after the action it is hoped they will exert. It is so delightfully simple and so fatally and disastrously easy to construct and use a hospital pharmacopoeia on these lines. Let us have a Mist. Expectorans for all ordinary coughs, and a Mist. Phthisica for those that we suspect are tuberculous; a Mist. Gonorrhœæ Acuta for early cases of urethritis, and a Mist. Gonorrhœæ Chronica for cases that prove more resistant; a Mist. Diarrhoeæ for all obscure cases of diarrhoea; a Mist. Cardiaca for heart cases, and a Mist. Tonica for all other vague and indefinite diseases where the diagnosis is beyond our ken. We can then sit at our out-patient desk, or bustle round our wards, treating our patients with the greatest ease and facility, for the diagnosis automatically prescribes the treatment. If this is how our stock mixtures are misused, then let us admit at once that the sooner this blot is removed from the scutcheon of modern medicine, the better for its fair fame. The first essential for the intelligent use of stock mixtures is a proper method of recording them in the hospital pharmacopoeia. In the great majority of cases a mixture should be named after the principal ingredients it contains. On the left-hand side of the record should be stated the amount of each ingredient contained in one dose, for reference in prescribing; on the right-hand side the amount of each drug required for a four-pint Winchester quart bottle, for facility in making up stock mixtures in the dispensary.

Care in recording the prescriptions will all be wasted unless the physician so familiarises himself with them that, as he writes each name, he realizes exactly what active drugs he is ordering and in what dose. How easy to feel complacently satisfied that we have done our duty by ordering Mist. Quininae for a case of malaria, oblivious of the fact that a particular patient may need twice or three times the five grains of quinine in the usual dose of our stock mixture.

The stock mixtures in a hospital pharmacopoeia should not be so numerous or so comprehensive as if intended to meet all possible
therapeutic indications. Such an achievement is neither possible, nor even desirable. Stock mixtures such as Mist. Gentianæ Alk., and Mist. Gentianæ Acid., for example, should not contain Liq. Strychninæ; this can be added or withheld according to the judgment of the physician as he considers the needs of each case. To use stock mixtures efficiently, the prescriber must develop flexibility in ordering them, not only adding single drugs when required but carefully regulating the dose also, or combining different mixtures as each case may require.

In this way stock mixtures may properly take their place side by side with special prescriptions to complete a doctor's system of prescribing. One kind helps the other. It is just here that the retention of stock mixtures in hospital practice is so vitally important for the sake of the doctor himself, especially the young Chinese graduate in his early professional life. It is a commonplace that prescription writing is in danger to-day of becoming a lost art by the medical profession; but the young physician who uses the above system is daily drilled in the use of his drugs. The effective limits of dosage are gradually mastered; he becomes familiar with the various pitfalls of incompatibility; and he learns how to augment or mitigate the action of drugs by skilful combination. Thus he watches and appreciates the play of drugs on the human body, and learns with a sure hand to modify and control the course of disease; he rises to the dignity of a physician. Every year now our missionary hospitals are being manned more and more by young Chinese graduates: omit this prescription writing from their training, and what can you give them that will take its place?

**The Use of Tablets and Other Special Preparations.**

We should notice two forms of medication that during recent years have threatened to oust mixtures from their old position and to obviate the necessity for prescription writing. At one extreme is the hospital tablet machine with its appeal on the ground of "simplicity"; and at the other the specialties of the wholesale drug manufacturer with their alluring names and their complex formularies of fearful and wonderful drugs. We may allow at once that each form has its place. Certain of the dry salts are much better given as tablets or tablet triturates, especially those it is desirable to administer alone, or that are insoluble or nearly so; or
whose dose is small. But this group has its definite limits, and to extend it unduly would very seriously impair flexibility both in dosage and combination of drugs, and tend to produce a mechanical and stereotyped habit of prescribing. For no hospital, even the wealthiest, can pretend to make or stock tablets in a variety of combinations and dosage commensurate with the needs of individual patients. Of the wholesale druggists' specialties it may also be said that a very considerable number have so established their usefulness as to have reached a position similar to that of the standard national pharmacopeial preparations. We think at once of certain valuable preparations of the hypophosphites, of cod-liver oil, of coal tar, and of many other drugs which cannot be successfully imitated or equalled by any hospital dispensary. But the range of real usefulness of these specialties is also definitely limited, and the doctor who seeks to escape the tedium of doing his own prescribing by relying on the ready-made formulae poured in on him by every mail from these great manufacturing and advertising firms, is delivering himself bound into their hands. How can he distinguish or judge of the action of any one drug in a complex mixture of six or eight, the greater number of which are rare drugs of whose therapeutic action, if indeed they have any, he is absolutely ignorant and not one of which can he in any way modify in the mixture as procured. He will soon find that his drugs bills are alarmingly and unnecessarily high, and that instead of being master of his drugs, the drugs have mastered him.

**The Psychic Value of Drugs.**

Any adequate discussion of the psychic value of drugs is alike beyond the scope of this paper and the ability of the writer; but our conspectus of the place and use of stock mixtures would be incomplete without an allusion to the patient's opinion of the virtue of medicines. The "placebo" is a time-honoured device, much ridiculed and caricatured as mere mercenary quackery, but yet of very real value as every old practitioner has proved. It often alleviates the patient's symptoms, tranquillises his mind, and above all secures his obedience to orders in regard to such accessory treatment as rest and diet by means of its silent witness in the sick man's home to the authority of the doctor who prescribed it. But this psychic value is not confined to placebos. We must remember
that it is an additional factor latent in every bottle of medicine containing drugs which have been prescribed primarily for their more obvious physiological action. We cannot afford to ignore this psychic effect, and shall be well advised to exploit it to the full.

Then how are we to secure that it shall be of the maximum value in the medicines we prescribe? Surely not by giving out a pill-box of little insignificant white tablets. Even allowing for the fact that among a section of the more modern Chinese a fashion for tablets is setting in, surely no one will maintain that their psychic effect on a patient can usually compare with that of a bottle of medicine, well-coloured, of a distinctive aroma, and with a full-bodied taste. Let us then compound our mixtures, and in doing so let us be ever mindful of the maxim which bears the same authority today as it did a thousand years ago, "Curare, elio, tule et jucunde".

In many instances the active drugs of a prescription have a taste powerful enough to impress even the most phlegmatic patients, and it may more often need mitigation by palatable flavours than accentuation. We have available for this purpose the more expensive flavors such as Ext. Glycyrrhizae, and the various cheaper syrups, pharmacopoeial and otherwise, with saccharin, glucose, or cane sugar as their basis. Perhaps for Chinese patients who like to be impressed by the medicines they take, it will be decided that little modification in the flavouring of mixtures is necessary.

For aromas we have the the more delicate, refined, and expensive pharmacopoeial preparations such as Tr. Lavandulae Co. and a large variety of very inexpensive medicated waters and essences of which we may take Aq. Chloroformi, and Aq. Menth., Pip., as types.

As regard colouring, again we find that many mixtures containing tinctures and infusions are sufficiently provided for by the colouring matter of their active principles; but where the colour is insufficient it should be supplemented by such pharmacopoeial agents as Tr. Cardamomi Co., Tr. Croci, or Tr. Cocci, or better, by the cheap, unofficial but very effective preparations of carmine or certain of the aniline dyes. With such a wealth of agents at our disposal, at a price that is infinitesimal, and requiring
no more trouble than a little foresight, we have no excuse for issuing any mixtures that in flavour, aroma, and colour do not make the maximum psychological appeal to our patients.

Despatch in Dispensing.

In order to dispense mixtures with despatch in a busy hospital it is necessary carefully to plan beforehand both the dispensary and the technique. The building and shelving should be arranged conveniently for the work, and a complete outfit of labels and all dispensary accessories provided.

By far the most tedious and irksome procedure in the dispensing of mixtures is the weighing out and dissolving of dry salts. This can be almost entirely obviated by preparing beforehand, and keeping always in stock, concentrated solutions of these drugs. Practically all the commonly used soluble salts can be made up in solutions varying from one to one, to one in twelve, according to their solubility. Most of them keep very well, and the few that do not can be preserved by making up with chloroform water. By this means dry salts can be dispensed by the measure glass as quickly and accurately as tinctures or infusions, the weighing by scales thus being unnecessary.

There are certain other legitimate short-cuts that may be employed, such as the use of essences for the extemporaneous preparation of the various medicated waters, the use of concentrated fluid extracts to replace their equivalent of infusions, and possibly the suspension of certain insoluble powders, such as bismuth carbonate, in water to avoid the necessity for weighing. When this is done the bottle should be vigorously shaken before the drug is measured out.

By these means, and with a dispenser of fair ability thoroughly well drilled in his work, the dispensing of all mixtures can be carried out accurately, and yet at a speed that is surprising to anyone who has not actually practised it.

Need for Economy.

Any system of medication to be of wide use in Chinese mission hospitals must fulfil one primary indication—it must be cut down to the lowest possible price. There are three ways in which this principle may be applied to stock mixtures.
It has been well said that a physician, in progressing from his raw student days to those of the mature practitioner, usually passes through three stages in his attitude towards drugs. As he leaves his medical school, crammed and dazzled with the wealth of the materia medica he has been studying, he has a boundless faith in the efficacy of drugs. Before long he finds one drug after another fail him; the results described by his lecturers and textbooks do not materialize when he exhibits the medicines, and in his disillusion and disappointment he hastily swings to a thorough-going cynicism and declares that drugs are a useless sham, a mere conventional hoax by which a doctor deludes his confiding patients. Finally, as the years pass, out of his raw credulity and hasty cynicism there emerges a reasoned and scientific confidence in certain drugs which he has thoroughly tried and tested. It is not until he has reached this third stage that a doctor is in a position to construct a pharmacopoeia for a Chinese mission hospital.

The first way in which such a man can apply this knowledge and experience is by wise discrimination in the choice of active drugs and preparations. The average mission hospital cannot afford to include in its list any of doubtful value and efficacy. Experimental work along these lines must truly be carried on persistently and thoroughly; but this is a function for other institutions than those which we are here providing. The mission hospital doctor has, generally speaking, neither the leisure for accurately observing, recording, and tabulating the action of new half-tried drugs, the money for which in many cases must prove to be useless expenditure; nor perhaps has he the disciplined and scientific habit of mind which alone can logically interpret and make good use of the results of such observations. To this dictum there are some obvious exceptions, yet the rule should be that our hospital pharmacopoeias contain only those drugs that have been widely and thoroughly tested, whose use is well understood by the profession at large, and whose efficacy is beyond dispute.

Even among such drugs discrimination is required. Of two whose therapeutic use and action are approximately identical, preference should always be given to the less expensive. Thus Liq. Strychninæ should be preferred to Tr. Nucis Vomicæ;

Apart from the essential active drugs and preparations just referred to, all other ingredients of stock mixtures should be cheap. This rule applies especially to vehicle and adjuvants included for their psychic value. Thus when a brown colour is required, Liq., Sacchari Usti should be preferred to Ext. Glycyrrhizae Liq., and for a red colour Liq. Carmini rather than Tr. Cocci. As aromas, the cheap essential oils should be used rather than the more expensive.

The third way in which a large reduction can be made in the expense of stock mixtures is by the use of cheaper substitutes for the more expensive pharmacopoeial preparations of certain drugs. Such a substitution can only be sanctioned in cases where it can be effected without any impairment of the therapeutic action and effective stability of the drug. As types of this kind of substitution we may instance the following: (a) ten per cent spirituous essences of the essential oils instead of the aromatic aquae; (b) glycerine elixirs of antimony tartrate and ipecacuanha instead of the official vina made with sherry; (c) peanut oil in all liniments where olive oil is official; (d) the concentrated fluid extracts of the great manufacturing chemists in place of the official decoctions and infusions; (e) tinctures made with glycerine or locally bought spirit and the above mentioned concentrated fluid extracts, rather than the pharmacopoeial tinctures. The last of these classes is very important, and alone will be found to make a great reduction in the year's drug bill.

Objections and Criticisms.

Against the recommendation of stock mixtures made in this paper three serious criticisms may be levelled by those who would urge instead a greater use of tabloid medication. It will be said that under the conditions of the Chinese climate and storage in mission hospitals, liquid preparations become very unstable and rapidly lose their potency. This is a very grave danger, and one that must be squarely faced and answered. Generally speaking, it may be said that concentrated fluid extracts keep better than the pharmacopoeial tinctures; but many even of these fluid extracts deteriorate more or less rapidly under the conditions obtaining in
our hospitals. A sample of fluid extract of ergot, put up by a firm of drug manufacturers which has perhaps the highest reputation in the world for the quality and reliability of its galenicals, was recently physiologically tested in Peking, after being stored in China for less than a year, and found to be absolutely inert. Fluid extract of digitalis similarly deteriorates very rapidly, and the same firm will not guarantee its reliability at full strength after one year. Other fluid extracts and tinctures also deteriorate and lose their strength at varying rates, though seldom as rapidly as the two just mentioned. Indeed, when we consider that some mission hospitals have on their dispensary shelves tinctures that have been standing there for a good many years, it would probably be a safe estimate to hazard that fifty per cent of them are practically devoid of any trace of physiological activity.

To realize this danger is to avoid it. Fluid extracts should only be bought direct in original bottles from those firms whose reputation is established beyond all shadow of doubt, and who take every precaution for the standardization and stabilization of products. It is a simple matter to estimate approximately the hospital requirements for some time ahead, and the drug order should be made out accordingly. In most cases it will be quite safe to order fluid extracts for one or even two years in advance; as to those which are especially unstable, fresh supplies should be bought every six months, or even every three months, in quarter-pound bottles.

It has sometimes been urged that in the case of mixtures, as compared with tablets, the patient is apt to be much less accurate in the dose he takes. In many cases this is due to the hospital's failure to give precise written as well as oral directions on the point. But in any case, by the simple device of using bottles with graduated marks stamped on the glass the dosage can be brought to exactly the same standard of accuracy as with the substitute suggested; for the patient who will drink at one draught three or four divisions of his medicine is just as likely to make a meal of his box of tablets.

Perhaps the most serious difficulty urged against the use of mixtures is an apparently trivial detail of practical management. For hospitals working among a poor population the cost of bottles
is a very awkward problem. In large centres of commerce such as Hankow this difficulty does not arise, as many patients bring their own bottles with them, and if not they can be bought on the street at the rate of about sixty cash for an eight-ounce bottle. A large hospital in Hunan has its bottles made in Japan and stamped with the hospital's name at a gross cost to the patient of about four hundred cash for an eight-ounce bottle. This is certainly rather a serious item in the expense of the Out-patient Department; but a system of treating the payment as a deposit, to be refunded if the patient returns the bottle, would go a long way towards solving the difficulty.

**General Estimate.**

In instituting a pharmacopoeia for any hospital the prescriptions must be chosen with careful consideration for the actual therapeutic requirements of the doctors concerned, and also with regard to the limitations and potentialities of the hospital dispensary and the conditions of the drug market.

The system here described, if thoroughly carried out, prevents the waste arising from a large number of special prescriptions in hospital work and from the careless choice of drugs; and it very much reduces and expedites the work of the dispensary, and by systematising it improves its accuracy; at the same time, so far from stereotyping and stultifying the doctor's skill in using drugs, it is a valuable training in their efficient handling, and it also saves a great deal of the time usually expended in prescription writing by providing an efficient and flexible machine for his therapeutic work. The pharmacopoeia should make it possible to retain a side field for this form of administering drugs, a form which, as compared with all other forms of oral administration, secures a maximum of efficiency.

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*Note.—*The writer wishes to acknowledge his indebtedness in the preparation of this paper to W.G. Sutherland's "Dispensing Made Easy" (John Wright & Co., 1906), a book which for many years has been of invaluable assistance to him.
STANDARD PHARMACOLOGICAL FORMULARIES: AN IMMEDIATE NEED IN CHINA.*

BERNARD E. READ, Ph. C., M. S., PEKING.

Uniformity in the name, preparation, and strength of pharmaceutical products is absolutely indispensable to the medical profession. How can this be made possible in China? In this country there is no one standard; we may find in use the pharmacopoeias of America, Great Britain, France, Japan, Germany, and, more often than not, no standard book of reference at all; drugs are bought from every part of the world, the standard often varying according to the place. There is no general or international standard. Hence there are in use many names for one drug. What the British call phenacetin the Americans call acetphenetidin, and what the Japanese call boluo alba the Americans and British call kaolin. Even where these three countries have one standard name in common for a drug, there may be foisted upon our markets patent preparations with a like name attached to a very unlike product. All this produces no end of a confusion in the minds of our young Chinese doctors. For instance, there are the difficulties with digitalis. Where digitalinum is a recognized potent glucoside there exists a multitude of substances under the same name; also a number of supposedly pure principles of digitalis with as many names are put forward. For each of these particular claim is made for preferential use in place of what is recognized as a national standard product.

In this confusion some place their hopes of improvement in the establishment of a standard Chinese name, and much valuable work has been done by our Terminology Committee; but experience shows us that there is no greater snare than may be found in the very broad field of Chinese nomenclature. Consider the various Chinese names for carbolic acid such as chia po li, fei suan, fei ch'un, shih t'an suan, and others. This does not tend to uniformity. For many reasons we ought to choose the English names or the Latin names as the standard nomenclature in trade,

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in hospital work and in education for many years to come, and the Latin names should persist for an indefinite period.

With regard to the preparation of drugs there is considerable variation with certain commonly used drugs; for instance, in fluid extract of licorice the Union States Pharmacopoeia directs the use of licorice root, alcohol, water, ammonia water and chloroform water, while the British Pharmacopoeia directs that only the first three shall be used. With a number of important alkaloidal preparations there is also variation in procedure. Fluid extract of ipecacuanha is made in America with hydrochloric acid, in Great Britain it is made with lime. Still greater variation exists between these and the Japanese method which follows more closely the standards of the old German Pharmacopoeia. With the growing number of centers where galenical preparations are being made in China, it is a misfortune that we have no national standard.

The name and method of preparation are relatively unimportant compared with the possible variation in the strength of the final product. Here we have a serious difficulty with which physicians and pharmacists should be well acquainted. I first encountered it eight years ago, during the war, when I purchased phosphoric acid from Japan. Until I attempted to use it I did not realize that the strength of the concentrated phosphoric acid of the Japanese Pharmacopoeia is 20 per cent; that of the British Pharmacopoeia 66.3 per cent; and that of the United States Pharmacopoeia 85 per cent. One could cite a large number of instances of wide variation between Japanese standards and our standards; not that the Japanese product is necessarily inferior, but it is different. Thus the concentrated nitric acid of the Japanese Pharmacopoeia is 25 per cent; while that of the British Pharmacopoeia and the United States Pharmacopoeia is about 70 per cent.

**Table 1.—Variations in Preparations of the Pharmacopoeias.**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Acetphenetidinum. Acid Nitric, 67%-69%. Acid Phosphoric, 85%-88.</td>
<td>Phenacetinum. Acid Nitric, 70%. Acid Phosphoricum, 66-2%.</td>
<td>Phenacetinum. Acid Nitric, 25%. Acid Phosphoric, 20%.</td>
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</tbody>
</table>
Table I.—Variations. (Continued).

<table>
<thead>
<tr>
<th>United States Pharmacopoeia</th>
<th>British Pharmacopoeia</th>
<th>Japanese Pharmacopoeia</th>
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</thead>
<tbody>
<tr>
<td>Ceratun Plumbi Acet, 12.5%</td>
<td>Ung. Plumbi Subacet, 20%</td>
<td>Hexamethylethraminium</td>
</tr>
<tr>
<td>Epinephrine</td>
<td>Adrenalinum</td>
<td>Calomel</td>
</tr>
<tr>
<td>Hexamethylenamina</td>
<td>Hydrargyri Subchloridum</td>
<td>Hydrargyrum Bichloridum</td>
</tr>
<tr>
<td>Hydrargyri Chloridum mite</td>
<td>Hydrargyri Perchloridum</td>
<td>Liq. Ferri Sesquichlorate, 10%</td>
</tr>
<tr>
<td>Hydrargyri Chloridum Corrosivum</td>
<td>Liq. Ferri Perchloridi, 20%</td>
<td>Liq. Plumbi dili, 2%</td>
</tr>
<tr>
<td>Liq. Ferri Chloridi, 10%</td>
<td>Liq. Plumbi subacet dil., 1.25%</td>
<td>Liq. Plumbi Subaceti fortis, sp. gr. 1.277</td>
</tr>
<tr>
<td>Liq. Plumbi dil. 4%</td>
<td>Liq. Plumbi Subaceti, sp. gr. 1.235</td>
<td>Liq. Arsenicalis, 1%</td>
</tr>
<tr>
<td>Liq. Potassii Arsenitis, 1%</td>
<td>Liq. Potassii Arsenitis, 1%</td>
<td>Liq. Kali Arsicosi, 1%</td>
</tr>
<tr>
<td>Ol. Tiglium</td>
<td>Ol. Crotonis</td>
<td>Ol. Crotonis</td>
</tr>
<tr>
<td>Rhamnus Purshianus</td>
<td>Cascara Sagrada</td>
<td>Cascara Sagrada</td>
</tr>
<tr>
<td>Sulphonethymetanum</td>
<td>Sulphonal</td>
<td>Sulphonum</td>
</tr>
<tr>
<td>Tinct. Ferri Chloridi, 3.5%</td>
<td>Tinct. Ferri Chloridi, 5%</td>
<td>Tinct. Catechu, 20%</td>
</tr>
<tr>
<td>Ung. Sulphuris, 15%</td>
<td>Ung. Sulphuris, 10%</td>
<td>Ung. Zinci, 10%</td>
</tr>
<tr>
<td>Ung. Zinci Oxidi, 20%</td>
<td>Ung. Zinci Oxidi, 15%</td>
<td>Acid diaethylbarbituricum</td>
</tr>
<tr>
<td>Veronal, N.W.R</td>
<td>Barbitonum</td>
<td>Acid diaethylbarbituricum</td>
</tr>
</tbody>
</table>

These variations call for immediate attention and the establishment of a national standard which may serve in a legal way to regulate the use and sale of drugs in China. It is impossible for our Association to regulate this matter, but it would be well for us to urge upon the Government the need for immediate action.

For ourselves we need a much clearer conception of what our practical needs are. In a previous paper I attempted to bring out clearly what our aims should be under the following headings: (1) to help forward the claims of Western scientific medicine; (2) to simplify the teaching and knowledge of Materia Medica; (3) to effect sound economy in our hospital administration.
The necessity of economy attracts the attention of everyone who is connected with missionary hospital service. We positively cannot afford to have in our hospitals heterogeneous mixtures of indefinite drugs of indefinite preparation and indefinite strength. There is every good reason for simplifying our Materia Medica to the smallest number of factors possible, and then with those factors to make the most suitable presentation of each drug that is within the powers of the pharmacist. The paper to be read at this Conference by Dr. Chapman* deals with this side of the subject, in what one might term its breadth and elaboration. I should like to emphasize its depth and scientific purpose.

The experience of Japan should be of worth to the more advanced Chinese of the present day. In Japan the introduction of a National Pharmacopoeia was undertaken with the object of producing a work at least equal to that of any of the Western nations. In the year 1880, Masayoshi Matsukata, the Minister of Home Affairs, submitted the following proposal to the Government:

"Firstly, as a natural consequence of the non-existence of an authorized Pharmacopoeia, there is no standard for prescriptions and preparations, and such dangerous mistakes as the prescribing of German preparations according to doses are frequently committed. Secondly, since manufacturers frequently prepare medicines, using as their authorities the pharmacopoeias of various countries, different medicines are often met with labelled with different names. Thirdly, as we have no standard of our own to judge thereby the quality of the imported medicines, they must naturally be tested according to the pharmacopoeia of the country where they are manufactured; moreover, the foreign manufacturers, taking advantage of the non-existence of a Japanese Pharmacopoeia, tend to use the cheapest raw materials of an inferior quality for manufacturing medicines, especially for the purpose of importing them into our country, thus advertising that they care for nothing but their own pecuniary interests. Now the only means of putting an end to these abuses is to establish, in some way or other, a National Pharmacopoeia, as by entrusting the Central Council of Health with the power of selecting the medicines and compiling a Pharmacopoeia."

In November of the same year, the Central Council of Health in Japan was entrusted by the Government with the duty of compiling a Pharmacopoeia, and in January of the next year, the president and the members of the Committee of Publication, consisting of fifteen members, were appointed.

* "On Hospital Stock Mixtures" (ante p. 915).
The first edition of the Japanese Pharmacopoeia was published in 1886 and contained 470 articles. The basis was drafted in German and translated into Japanese at the same time as the Japanese text was issued, a complete translation being published by the Home Office. In 1888 it was decided to revise this first edition and a revised edition was published in 1892, which was followed by a third revision in 1907. In 1916 it was decided to revise the current edition, and five years after the beginning of the revision the present edition (fourth) was completed, and became official from April 1, 1921. An English translation prepared by the Pharmaceutical Society of Japan, was issued this year.

After this primary discussion of the subject we can better realize the need for better standards in China. We need a Standard Materia Medica with standard names, standard preparations and standard strengths. On the other hand, along the lines that Dr. Chapman has pointed out, we need a useful book of reference for our Chinese dispensers to which they may turn for standard mixtures and standard preparations of the standard drugs.

Many are content to use the pharmacopoeias of their respective home countries, and are apt to look with scorn on that of any other country. It should be emphasized that for all practical purposes there is not a vast amount of difference between the strengths and preparations of the British Pharmacopoeia and those of the United States Pharmacopoeia. Where there are variations they are usually of a very insignificant character, such as the variations between such preparations as tincture of lemon, tincture of quillaia and tincture of ginger. The more important preparations such as tincture of digitalis, tincture of strophanthus, compound tincture of camphor, etc., are the same. On the other hand, preparations of opium, nux vomica, and belladonna are slightly different in the two pharmacopoeias. Almost without exception where the differences are great the preparations are either of the unimportant bitter class, or are not in any case very satisfactory, such as sweet spirits of niter (U. S. P., 4%; B. P. 2%; as used in China, because of the volatility, probably one-half of 1%).

As to the original drugs included in the pharmacopoeias of the two countries there is no serious difference, and it is of interest to see that with regard to the important drugs the two pharmacopoeias are practically the same. The differences are minor.
The United States Pharmacopoeia no longer includes lily of the valley, krameria, hops, poke-root and broom tops; and the British have long ago omitted manna, tobacco, and treacle. From these standards there should be no dissent. Should anyone have a bias in favor of one or other of the drugs omitted, he should be prepared to discard it; if he has a prejudice against one or the other let him forget it. There should be no slavish adherence to one's own national standard, but all should support the standard of the international protocol. The differences are not very great. In any case, it will be found that the pharmacopoeias include much unnecessary material. According to a statement of the American Medical Association some time ago, the number of drugs in the pharmacopoeias is far too large for intelligent practical use, and in spite of recent deletions there are still many included which are worthless or superfluous. A useful handbook which can be recommended for general use, is entitled "Useful Drugs;" it is published by the American Medical Association. This book might well be used to define the limits of our ordinary Materia Medica. As a matter of fact, no modern institution uses even this limited number of drugs in regular work, so there is room for further modification. It is possible to delete a number of duplicate remedies, just as heroin has been recently deleted because the advantages claimed for it have not been confirmed and there is the same danger of habit formation as with morphia. Then in one institution it is not necessary to stock both phenacetin and acetanilid. In a former paper I showed that the list of drugs could be reduced to 137, instead of the many hundreds which are included in our pharmacopoeias.

Another suggestion concerns the replacement of the drugs of one country by those of another. The common drugs used as adjuvants in medicine to color or flavor, such as the aromatics and bitters, may well be Chinese instead of Western. Again, a perusal of the Japanese Pharmacopoeia suggests a number of remedies which might well be placed on our regular list: hydnocarpus oil, scopolia japonica (Japanese belladonna), and one or two other indigenous Oriental drugs which are mentioned in the fourth edition just published. This edition also includes several good bitters found in China: geniana scabra, swertia chinensis, coptis teeta, etc., (Pharmaceutical Journal, 1922, Vol. 109, p. 559).
We also need the addition of certain newer remedies like colloidal antimony, but no quack preparations. There is also needed a reference book of drugs in common use and of the newer drugs the use of which should be more common. Also a book giving stock mixtures and galenicals with the details of their preparation, which can be used as a work of reference in our Chinese dispensaries and as a standard for our general hospital practice. Generally speaking, the British Pharmaceutical Codex is the best book available; it far surpasses the National Formulary which contains a medley of gun-shot prescriptions. Such books will still present us with too many preparations, so we need simpler formularies for our regular work. Already we have in some of our educational centers hospital formularies comparable to those used in the home hospitals. We have before us to-day those from Changsha, Tsinan, and Peking. In the interest of economy and efficiency it is to the advantage of even the smallest hospital to adopt some standard which confines the prescribing to the limits of the formulary and deletes from use obsolete remedies and introduces valuable new ones. But these simple formularies contain no information concerning the procedure of preparation. Surely, there is room for a C. M. M. A. manual which shall include:

1.—Standard names, preparations, and strengths of all drugs in common use in our missionary hospitals as decided from data submitted by the same.

2.—Formulas for stock mixtures, pills, tablets, etc., as used in our institutions and approved by a joint committee appointed by our Association.

3.—The addition of brief editorial notes in the Chinese language giving the method of preparation, so as to render the book of the greatest service to our Chinese dispensers.

This is no easy task. I suggest as a model the books already mentioned: "Useful Drugs," Part II of the "British Pharmaceutical Codex," and Part III similar to the "Japanese Extra-Pharmacopoeia" (日本薬方全集).
NOTES ON THE OCCURRENCE OF TAENIA SAGINATA IN NORTH CHINA

RALPH G. MILLS, M.D., Peking.

In a recent communication from this department Faust (1923) says: "Twenty-five years ago infestation with Taenia saginata was common in North China. The infection was brought down in cattle from beyond the Great Wall, which were slaughtered immediately and offered for sale in the markets. Today such infection occurs rarely in Peking and vicinity. The cattle come from the same locality and are presumably infected, but for economic reasons they are fattened for a period of from several months to a year in local yards and, when slaughtered, are relatively free from infection."

The impression is quite general that the beef obtainable in Peking is not infected with tape-worm and is therefore safe for consumption without special inspection. The fact that this is an erroneous assumption is the primary reason for recording the following observations.

Through the cooperation of an intelligent German butcher I have secured numerous samples of beef containing Cysticercus bovis. One piece weighing 3 lbs. from the leg muscles of an ox contained 4 cysts, and another weighing 5 lbs. contained 10. Four of the animals were bulls and one a cow in whose tenderloin several cysts were found. By casual examination then he discovered 5 infected animals in less than 300 examined, or roughly 2 per cent.

Careful routine examinations made for municipal and scientific purposes by Hertwig (cited by Fantham, Stephens and Theobald, 1916) showed "that the cysticercus of the ox is found chiefly in the musculi pterygoidei externi and interni, and since that time a far greater number of infected oxen have been found in Berlin." If, then, the infection in the leg muscles reaches the extent observed it is highly probable that a systematic search of the tongue and throat muscles would yield a much higher per cent. of infection, as it did in Germany. The investigations of Hertwig led to certain municipal regulations which are summarized by Fantham, Stephens and Theobald thus, "The flesh..."
Occurrence of Taenia Saginata in North China.

of oxen only slightly infected (containing not more than 10 living cysticerci) is sold in pieces of not more than 5 lbs. to customers after having been rendered innocuous by cooking, or by pickling for 21 days in 25 per cent. salt brine, or hanging for 21 days in suitable refrigerators; oxen in which only one cysticercus is found are allowed free commerce, and those strongly infected (i.e., containing more than 10 living cysticerci) may only be used for industrial purposes."

Reissmann (quoted by Fantham, Stephens and Theobald) states that more bulls than cows are infected, 0.446 per cent. for bulls and 0.262 per cent. for cows, a condition explained by Ostertag by the fact "that most oxen are killed when young, when also infection most readily takes place, and further, that the larva later on in life can be completely atrophied."

On the basis of unofficial statements from the butcher and a collector of the tax on imported cattle, it appears that about 15,000 animals are brought annually to this vicinity. They are nearly all bulls between 6 and 9 years old, and a few older cows. Approximately one third are shipped as dressed meat to the north city, another third are consumed in the south city, and the remainder are for the extra-mural population. The annual consumption of beef by those living within the walls is about 10,000 animals, or one beef for 50 persons. The proportion for the ordinary Chinese population is actually very much less when deductions are made for the number consumed by 3,000 foreigners, numerous wealthy Chinese and the large number of restaurants and hotels. The poorer people rarely eat beef, as mutton and pork are much less expensive. Of the total number of cattle, roughly two-thirds come from the region about Kalgan, the remainder being raised (or possibly temporarily fed) in the vicinity of Peking, and a very few brought in from Shantung Province. A few milch cows are also imported by local dairies from Japan or other parts of China.

As a matter of some interest, the cases of tapeworm infection that have been admitted to the Peking Union Medical College during the past two years were examined with the following results:
The above cases include all hospital patients infected with any form of tapeworm in the adult state except one who harboured *Hymenolepis nana*. No case of *Taenia solium* infection was observed. So far as could be determined, only one of the patients came from north of Peking. Several patients state that they had tried various native and Japanese remedies before applying to the hospital for treatment. In most instances the patients knew of their condition, the exceptions being those in whom the ova were found by accident in the stools. These did not remain for treatment and the diagnosis is therefore left in doubt. The Chinese woman admitted to the obstetrical ward had been “needled” by a native doctor in the treatment of the abdominal distension which had been attributed to the presence of a tapeworm. The patients in whom only “tapeworm” was diagnosed were those in whom the specimen was not recovered or where treatment was not administered for various reasons: There was no doubt as to the presence of a tapeworm, and it may with certainty be assumed to be *T. saginata*. A glance at the occupation of these cases indicates the high grade of intelligence of practically every patient. This may indicate the class of people that seek hospital treatment, rather than any selective incidence of the disease. The reliance upon native remedies alone would be found more among the more ignorant classes of people and the occasional success of such measures would undoubtedly cause the incidence of the disease to appear to be much less than it really is.

Perroncito (cited by Fantham, Stephens and Theobald) found that the adult tapeworm grows about 3 inches per day. At this
rate the ripe segments would certainly appear in the stools within two months after the infection occurred. This fact would be of value in deciding when and where the infection probably took place. In this series the Frenchman came from Siberia more than a year before, the American Secretary arrived in Peking at least 5 months before segments were seen, the Chinese student from Honan had been in Peking several months before noticing the infection, the Shansi student arrived 18 months previous, and the Korean student had lived for several years in China. We are, therefore, safe in concluding that all the cases represent local infections. In addition to those patients mentioned are a number of foreigners, mostly British and Americans, who have been treated for tapeworm infection by various physicians of our own staff and those practising in the city. The number of known cases is about equally divided between Chinese and foreigners.

Mention was made above that animals kept in and about Peking were not so liable to harbour the infection as those coming directly from Mongolia. Where cattle are herded on the open plains the opportunities for them to get grass contaminated with human feces containing viable tapeworm eggs would be great. The opposite condition obtains in most other places in China where animals are separated and kept in barns or small enclosures where prepared food is given to them. The chances of widespread dissemination of such infections would be slight and this doubtless operates in an effective way in eradicating any sporadic outbreak. There are apparently no reports of the finding of cysticerci in beef from any place in China. Cases of tapeworm in man are not uncommon and doubtless have not been considered worth reporting for that reason. Maxwell (1921) reporting on intestinal parasitism in South Fukien, mentions only one case of *T. saginata* in man. This patient had been in the Straits Settlements and while there was treated for tapeworm. Upon his return he was again treated, presumably for a recurrence of the same infection. Examination of samples of beef disclosed no evidence of cysts. Pork was also free from similar infection and no cases of infestation with *T. solium* were observed.

Cooks, butchers, and others who handle or prepare foods are found to harbour the parasites in higher percentage than those engaged in all other occupations. The small series cited contains
only one person, the housewife, who had any connection whatever with food in preparation. It is interesting to note that among the hundreds of house servants examined here in a special clinic for the purpose, few cases of tapeworm infection were found. In 1920 Korns reported the results of the examination of 400 domestic servants, 328 men and 72 women, employed by foreigners, representing 88 households. The ova of the tapeworm were found in the stool of one individual. In another series, published in 1921, including 672 men and 128 women from 145 households, no cases of infection by tapeworm were observed. Dr. Ernest Tso (1923), of Peking, has recently summarized the findings in 950 employees of the Peking Union Medical College, in 132 of whom the stools were examined, without detecting the presence of any case of tapeworm. In addition, there were perhaps 100 domestic servants examined in the same clinic, which is a continuation of that conducted by Dr. Korns, without discovering any further case. Mr. Cameron, pharmacist to the Peking Union Medical College, informs me that he has filled only a few prescriptions for tapeworm treatment for persons in the outpatient department and that this drug is supplied to the hospital wards on an average of about once a month. This agrees very well with the series of cases from the wards cited above, the medicine for whose treatment was supplied from the drug room.

My office secretary was commissioned to secure what information he could from native sources. Most of the medicine for the treatment of tapeworm is purchased on the street or in the fairs from itinerant drug merchants and relatively little is bought in the established native drug shops. A good deal is sold, thus indicating that the infection is relatively common. This medicine is not regarded as being very efficacious and some cases that he came across had tried repeatedly to dislodge the worm without success. One fat, healthy man whom he met said he had carried his tapeworm for twenty years and had given up all efforts to rid himself of it. Another case was that of a cook in a British family who had evidently evaded examination because he believed that the hospital treatment for tapeworm involved the use of the knife. From this it would appear that the infection is much more prevalent than some of the above mentioned investigations would lead us to believe.

As to prophylaxis, the municipal regulations mentioned above serve as a safe guide. Refrigeration is safe if continued long
Occurrence of Taenia Saginata in North China. 937

enough, but facilities are almost wholly lacking in the Orient. There is no information at hand to indicate whether or not the drying of beef kills the cysts. However, dried beef is cut so thin that by ordinary inspection of the slices any cysts present could be readily seen. Boiling or thorough roasting would, of course, render the meat harmless. The difficulty in this process is that the center of a large piece of meat does not reach the same temperature as the outside. The degree of heating can only be judged by the appearance of the meat. Perroncito found by feeding experiments on calves that 45° C. was the lethal temperature for the cysts and he put the matter to a test on a number of people. Lower temperatures had little or no effect. The protein of beef coagulates at 55° to 66° C.; hence such a temperature would render the meat perfectly safe. This does not completely remove the reddish color, but each muscle fiber has been changed from a semi-translucent to a perfectly opaque structure. It may, therefore, be confidently assumed that unless this change has taken place, the meat may still contain viable cysts. Inquiry among the Chinese in Peking as to the way of preparing beef indicated that in most instances the meat is boiled. Another method is to soak the flesh in brine and then allow it to dry, eating it perhaps weeks or months later. Meat and vegetables are also mixed together in a finely chopped condition, wrapped in a sheet of dough and then steamed. Opinions seemed to differ as to whether the meat was previously cooked, and, if so, how much. Beef was apparently never eaten in the raw or unprepared condition. Beef and vegetables are sometimes fried together, but the beef is in small pieces and is generally well cooked. In restaurants or wealthy homes, a form of native chafing dish is often employed, but in the north, at least, is used only for the cooking of thin slices of fish or mutton. The meat is plunged into boiling water for a minute or two and is apparently completely cooked.

The restaurants and public eating houses are very popular among the Chinese and are frequented especially by those of some means, particularly when they have only a temporary residence in Peking. In such places the amount of food cooked is very great and the temptation to rush the orders might easily lead to insufficient cooking, especially of meats. Nearly all of the cases of tapeworm infection cited above belong to the classes that frequent such places of amusement and refreshment. The number of students who go there is particularly large.
There is surprisingly little information based on experiment available in the literature that has direct bearing on the problem in hand. Leuckart (1886) summarized the work which had been done prior to 1886 and cited several investigators. Five months after some feeding experiments the cysts were found viable in the muscle of calves without evidence of atrophy or death of any individual. In view of this fact, one could hardly expect that the temporary fattening of cattle in Peking imported from Mongolia would have any appreciable effect in lessening the intensity of the infection. Perroncito found that the cysts do not outlive the host more than 14 days, especially if some degree of putrefaction had taken place. This was observed particularly in the tongue. Soaking in water for 24 hours usually killed the cysts, although the size of the pieces used for experimentation was not stated. Brine was more certainly lethal in its action. Apparently then, "corned beef" should be free from living parasites.

In his paper on Helminths in China, referring to the geographical distribution of *Taenia saginata*, Faust (1923) says that infestation has been "reported from time to time from various parts of the world, particularly from individuals fond of beef only partially cooked. Occasional reports from various parts of China, but confirmed as indigenous only in North China, where the infection is brought down from Mongolia and Siberia. In and around Peking, more common in foreigners than in natives." A few facts bearing upon the distribution of the worm in the Far East are also mentioned by Leuckart. Baelz wrote him from Japan, saying that *Taenia saginata* was even more common there than *T. solium*, the pork tapeworm. Fedschenko (cited by Leuckart) found the infection widespread in Central Asia and the French soldiers brought it back with them from the Palikao Expedition. Mr. Ma Kiam has kindly furnished some interesting information in regard to this military campaign. In all, the troops were in China about three months, arriving in Tientsin in August, 1860; and they marched toward Peking along the grand Canal. About three weeks later they took Chang Chia Wan, three miles from Tungchow. This town is largely inhabited by Mohammedans who live chiefly on beef and mutton. The battle of Palikao was fought three weeks later and the troops then entered Peking. Being unprepared for cold weather, they concluded an early peace and departed about November 1st. Presumably the
army depended largely upon supplies obtained locally. Beef being available in such a community was doubtless prepared according to their own methods, which at home lay them liable to infestation. Such infection, therefore, as they contracted evidently had its origin in the vicinity of Peking.

SUMMARY

1. *Cysticercus bovis* from beef offered for sale in Peking, is here reported as the first instance of its observation in China.

2. *Taenia saginata* has been discovered or suspected in 12 cases during 2 years in about 4,500 hospital cases. Two were foreigners and 10 were orientals. All contracted their infection in Peking.

3. The incidence of infection among the native population is probably higher than the records of the servant’s and employee’s clinic would indicate. Native treatment and indifference to the infestation tend to decrease the number of cases seen.

4. The Chinese methods of preparing beef are apparently effective in most instances, but suspicion points to restaurants in which haste and carelessness in the preparation of food may allow an occasional infection to take place.

5. Careful inspection of thinly sliced meat or the coagulation of muscle protein by heat or the treatment of beef by various methods of preservation are the only safe prophylactic measures.

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THE PREVENTION OF DISEASE IN THE TROPICS.

At the Fifth Congress of the Far Eastern Association of Tropical Medicine held at Singapore in September, 1923, the President of the Association, A. L. Hoops, M.D., O.P.H., B.A., Principal Civil Medical Officer and Member of the Legislative Council of the Straits Settlements, delivered an address the main part of which is as follows:

"Herbert Spencer wrote:—To be a nation of good animals is the first condition to national prosperity.

"The requisites of personal health are well known:—adequate food, light and air, shelter, cleanliness, exercise and elbow-room.

"All our Eastern countries contain crowded cities, and in these cities a large proportion of the poor live in crowded slums. How is health possible when men, women and children lie down to rest huddled in airless rooms—rooms where consumptives, made tuberculous through this very overcrowding, spit on the floors, and pawing infants introduce infected sputum into their mouths? In some of these slums when the floors are full, human beings pay one quarter of their monthly earnings to sleep on shelves tier above tier in dark passages. In these slums where a single bath and latrine, often contiguous to the kitchen, are used by 30 or 40 people, cleanliness in impossible.

"Most large cities have in the past grown up without law or order: year by year more people have pressed into them. The remedy is clear:—town planning, zoning, the building of enough houses in new residential areas to relieve overcrowding; the provision of cheap transport to enable the poor to live in these areas, and to travel to and from their work; modern sanitary arrangements.

"These measures must precede the destruction or reconstruction of old insanitary tenements, and the provision of playgrounds.

"Starvation is not common in the tropics. More malnutrition results from the use of improper food, and badly prepared food, than from lack of food. The three great deficiency diseases, beri-beri, scurvy and rickets are all preventable by proper diet, plus
sunlight in the case of rickets. The sun is a prime preventive and remedial agent not only of tuberculosis but of other diseases. The heat of the sun is nature's antiseptic. But into many tenement houses the sun never shines.

"The prevention of dental decay will avert the majority of digestive troubles to which flesh is heir. Here again food is an important factor: the formation of the temporary teeth, being determined before the child is born, is influenced by the mother's diet.

"In Malaya the rural population, amongst whom undermilled rice is the staple food, and breast feeding is almost universal, have good teeth. Amongst city dwellers, many of whom eat overmilled rice, or overmilled wheaten bread, and whose babies are often bottle fed, a sound head of teeth is the exception. Medical inspection of schools here during the past two years discloses that nearly two-thirds of school children in Singapore city are suffering from serious dental decay, while the proportion in our rural schools in Province Wellesley is under five per cent.

"Our large Eastern cities need prenatal clinics, maternity hospitals, training centres for midwives, post-natal clinics, child welfare activities—dispensaries and sanatoria for the tuberculous—venereal clinics, school and dental clinics. But what will these avail, unless we remove the sources of evil—overcrowding and bad feeding? Good housing is a powerful agency in the suppression of that scourge of mankind—plague. In Assam the moving of inhabitants from infected houses to new quarters has greatly aided the diminution of kala azar.

"This remark leads me to mention two diseases commoner in rural areas than in towns: First there is malaria, the pest of the tropics, and not unknown in temperate climates.

"Let us acclaim Ronald Ross, who 25 years since worked out the mosquito theory propounded to him by Manson, to a triumphant conclusion—rendered possible by Laveran's discovery of the parasite 18 years previously. Ross's achievement revolutionised life in the tropics. It was perhaps the factor which determined our great colonial administrator Joseph Chamberlain to initiate a forward health policy in the British Colonies, and it led to the establishment of the London and Liverpool Schools of Tropical Medicine. There is still much to learn of this disease, but the day
will come when it will be as rare in many parts of the East as yellow fever now is in most parts of America. Its prevention will be discussed at our malarial symposium under the chairmanship of Dr. Malcolm Watson.

"Next comes ankylostomiasis, with which almost every Indian immigrant to Malaya and a great proportion of our Chinese and indigenous rural population are infected. Years ago, Stiles, the American zoologist, working in the Southern States of America preached, not only the cure of ankylostomiasis by drugs, but the eradication of its cause, the hookworm, by simple improvements in rural sanitation. His proposals attracted the attention of that great man, now alas, no more, Walter Page. Page brought Stiles' work to the notice of Flexner, Director of the Rockefeller Institute.

"This led to the incorporation ten years since, of the Rockefeller Foundation, and the organisation of its International Health Board for the promotion of International Hygiene. Funds were provided for a hookworm campaign, not only in America, but throughout the world. Following Gorgas' work, the Board has almost eradicated yellow fever in American countries, and has greatly lessened malaria.

"It is giving financial help to needy countries, and to the League of Nations, for the training of health personnel.

"The Foundation assists many medical schools. Its recent endowment of a Public Health School in London is known to all. The Peking College of Medicine is its offspring, the Hongkong Medical College, a recent foster child. It is furnishing scientific equipment and medical literature to many institutions, and especially in countries that have suffered most through the Great War.

"We have with us to-day a Rockefeller delegate, Dr. Sawyer, who for the past four years has, in collaboration with Australian health officers, been organising forces to exterminate the hookworm in the Continent of Australia. He will be one of the leaders of our discussions on beri-beri and ankylostomiasis in this Congress.

"The histories of malaria and hookworm illustrate the principle on which preventive medicine is based—the application of research to the problems of disease. The earliest and most successful instance falls only indirectly in this category. I refer to Jenner's epoch-making discovery of vaccination against small-pox which
has saved millions of lives, and has preserved the beauty of countless fair women. That great Frenchman, Louis Pasteur, by discovering and by teaching that disease was due to germs laid the foundations of modern medical research.

"Cinchona bark was used as an empirical cure of malaria for hundreds of years. During the same period drainage directed to improving cultivation had banished malaria from many regions. But it was not until the men of science took a hand, that a rational scheme of action to prevent malaria everywhere and under all conditions became possible. The malarial parasite is discovered, its life history is traced, the mode of transmission of infection is found by research. Next a number of earnest disciples, some of whom are in this theatre to-day, concentrate on the multifarious details that lead to prevention. They discover the various species of anophelines that carry the disease, classify them, study their habits, and consider the varied problems of destroying their breeding grounds—when to dam the sea out of a brackish marsh—when to encourage its entrance—when to drain a swamp—when to leave it untouched—when to fell the jungle—when to preserve it carefully—when to interfere—when to let well alone—which type of drainage suits which locality? In every case the cost must be counted, for neither Governments, companies, nor individuals wish to spend money needlessly, nor without an adequate return. Each outbreak of the disease is investigated and traced to its source. For if prevention is to succeed we must get at the Jons cl origo mali.

"The work of Manson and Ross illustrates another fact, that we learn best what we teach ourselves. Manson, the father of Tropical Medicine, acquired scientific methods, and made his observations on the transmission of the blood worm, filaria, to man by the female mosquito, while he was a busy general practitioner in China. Ross had little knowledge of mosquitoes or their anatomy when he started to reveal the mysteries of malaria. He taught himself. Several times he was transferred to official posts in which it was impossible to continue his researches. But he struggled back to his chosen course, and he headed again for his mark until he had attained it.

"The discovery by a brilliant band of American observers that yellow fever was also a mosquito-borne disease, and the methods of its prevention, followed.
"I will not weary you by multiplying examples of the steps in the prevention of disease:—first the discovery by research workers of the infective agent and of the means of its spread, then the development of methods of control.

"The great group of bowel diseases, the diarrhœas, the typhoid group, the dysenteries, and cholera, checked by a pure water supply, and good scavenging: the research work proceeding in India on the prevention and cure of such varied diseases as plague, leprosy, and kala azar: the diffusion of knowledge on venereal diseases, and their prevention: the success in the rural areas of the Dutch East Indies, and of Malaya and the Philippines of the campaign against another spirochætal disease—yaws: all these can only be mentioned in passing.

"I will put you one question for reflection: What is the cause of the increased prevalence of cancer in Europe? What must we do to prevent this disease becoming more common in the Tropics?

"For the widespread practice of Prevention an educated public, co-operating with an educated medical profession, is required.

"Because of the numerous applications of Preventive Medicine in infectious disease, non-infectious disease and surgery, the British General Medical Council has recommended in its new curriculum 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. Sir George Newman, Chief Medical Officer of the British Ministry of Health, in his latest memorandum on Recent Advances in Medical Education in England writes: 'The spirit of preventive medicine should animate all teaching to students and be illustrated in the treatment of cases. In fact it is not so much a separate subject of the curriculum that is required as a pervading influence, an attitude of mind, permeating and guiding all clinical study and practice. The purpose of medical education is therefore inherently altered. Its main object now is prevention—and when that fails—cure. But do not mistake me. It is not intended to exalt the specialist health officer above his fellows in curative medicine. We are all members of one body. We are taught in the Bible—and I doubt not that there similar teaching in the Holy books of other religions—that each of the many members of one body, the hand, the foot, the ear, the eye, and so on, has need of the others: none is greater than the other,
The Prevention of Disease in the Tropics.

each is dependent upon all the rest; so too with the great body of medical men and women, in every branch and of every nation.

"I do not envisage the establishment of a huge army of specialist health officers. We undoubtedly need a corps of such officers to deal with special problems, to initiate and superintend schemes, to work in important centres, to discover right methods, and to train the men, whether medical or lay, who are to carry out these methods. But the mainstay of prevention in rural districts must be the country practitioner, the rank and file, the P. B. I. of our profession, who is public health officer, physician and surgeon, family friend, and confidential adviser—all in one. In passing, it may be added that the would-be whole-time sanitarian should practise curative medicine before he embarks on his specialist course; and that, if he is wise, he will always retain his interest in curative medicine.

"I am glad to see here to-day in addition to the Director and several other members of our own Education Department, the Hon'ble Mr. E. A. Gilmore, Vice-Governor of the Philippines, and Chief of the Departments of Public Instruction and Health in those Islands. The education of public opinion must begin in the elementary, and must continue in the higher school. In this country a simple book, written in the Malay language by Dr. Winstedt, and conveying lessons of personal and public hygiene, is in use in our vernacular schools. Science is now a subject in our local English schools; in addition, our teachers are lectured in tropical hygiene by health officers, so that they may be qualified to pass on elementary instruction to their pupils of every race. In time, this will become more advanced.

"In many tropical countries the death-rate is double that in temperate climates. The death-rate in England has fallen to 13 per thousand, the infantile mortality rate to 77 per thousand,—(and in the families of medical men to under 40 per thousand). This sets a standard at which to aim. There is nothing inherently unhealthy in a tropical climate; and there is no reason, why these figures should not be approached, if public opinion is enlightened and organised.

"The press, and especially the daily press, is a great power to arouse a public health conscience. That power is at our service. Each individual should learn how to keep fit, and how to avoid disease. Man is a combative animal. Let every man, woman,
and child, make war on disease and its carriers; be rough on rats; and give no quarter to flies and fleas, mosquitoes and lice, the insect carriers of infection. Let personal cleanliness, and all it stands for, be taught and practised by all. So may we realise not only the union of the medical profession of the Far East, and the promotion of friendly international intercourse between physicians, but a greater union of every nation, East and West, to substitute for strife between men, a peaceful rivalry in the pursuit of Health. *Salus populi suprema lex!*"
REPORT OF C.M.M.A. EXECUTIVE COMMITTEE.
JUNE 29th, 1923.

Present:—Dr. Kirk, in the Chair, Drs. Davenport, Maxwell, Houghton, Fowler, New, Merrins and Tucker.

The minutes of the meeting of February 22nd, 1923, were read and after a few minor corrections were approved.

The Treasurer's Report for the last triennium was submitted. (See Ch. Med. Jour., June, 1923) The question of auditing accounts was discussed. It was moved that the auditing of the treasurer's accounts shall be arranged for by the Finance Committee. Carried. The Treasurer's accounts were then approved subject to the report of the Finance Committee.

Membership in Association.—The procedure of election was discussed. It was felt that it should be simplified, but as the procedure is provided for by the Constitution no action could be taken. It was moved that the question of simplifying the election to membership be referred to the Committee on Revision of the Constitution. Carried.

Two nominations of dentists for membership having been received, after a discussion the question was referred to the Committee on Revision of the Constitution. It was pointed out that dentists are at present eligible to honorary membership.

There was a discussion on granting life membership in the Association to members on payment of one sum to cover all annual dues. It was moved and seconded, that the question whether a change in the Constitution permitting life membership is desirable be referred to the Committee on the Revision of the Constitution, and that it should consult the Finance Committee as to the amount that should be charged. Carried.

C.M.M.A. Constitution and Code of Ethics.—In accordance with the resolutions passed at the recent Conference, it was moved and seconded that the chair appoint a committee for revision of the Constitution and a committee to compile a Code of Ethics. Carried.
In the afternoon session, the Chairman appointed as a committee for revising the Constitution: Drs. Fowler, Maxwell and Tucker. Committee for Compiling a Code of Ethics: Drs. Merrins, Davenport and New.

_C.M.M.A. Conference, 1923._—Dr. Maxwell reported that Dr. Kirk and he had discussed with members of the Hongkong University the arrangements for the 1923 Conference, and were able to state that the local branch of the British Medical Association had confirmed the invitation and that the university would lend its buildings for the Conference. It had been suggested that the morning and evening religious exercises of the Conference be held in St. John’s Hostel and all other meetings in the hall of the University. The accommodation for delegates and other visitors would be ample. It was also suggested that the first three days be given over to business sessions and the last three or four days to scientific papers. It was moved and seconded, that the Committee accept the invitation to meet in Hongkong and that it approves the suggestion of business occupying the first three days and scientific papers the last three days, and that the arrangements be left to the local committee. Carried.

Dr. Maxwell moved and Dr. Fowler seconded, that a circular be sent to the Missions in China drawing their attention to the scientific importance of the C.M.M.A. Conferences to the Missions’ doctors and hospitals, and urging that for this reason the travelling expenses of missionary physicians attending the conferences should be borne by the Missions. Carried.

In regard to the ownership of scientific papers read at the C.M.M.A. Conferences, and their publication in the “China Medical Journal” it was moved that the question be referred to the Committee on Revision of Constitution and By-laws, with the statement that the Executive Committee is of the opinion that all Conference papers should be available for publication in the “China Medical Journal”. Carried.

There was a discussion as to the best time of year for the holding of C.M.M.A. Conferences. It was the opinion of the Executive Committee that the decision should be left to the members in the locality where the conference is to be held.
Institute of Hospital Technology.—Dr. Fowler, in presenting a report on the work of the Council on Hospital Administration, reported progress, especially in regard to the selection of a centre and the establishment of an Institute for the Training of Hospital Technicians. The following resolutions were carried:

1. That the Committee invite the Wesleyan Missionary Society to reappoint Dr. George Hadden to China if his health warrants the Society so doing, and requests the Society to set him free on his return to the field for the work of promoting the establishment of a missionary Institute of Hospital Technology in China, such work to be in connection with the Council on Hospital Administration of the C.M.M.A. and under the supervision of the Executive Committee of the same Association.

2. That the following recommendations be made to the Council on Hospital Administration concerning the Institute of Hospital Technology.

a. That the Executive Committee favours the Wu Han centre for the establishment of the Institute, provided that it shall be a co-educational institution and that training in at least two branches of hospital technology be provided for.

b. That this Committee approves training in other branches of hospital technology being carried on, for the present, in such centres in China as have staff and equipment available for such purposes.

c. That this Committee suggests that the Board of Control of the Central Institute shall be made responsible for the co-ordination of the work of these sub-centres with its own work, and of setting standards of instruction and examination of hospital technicians throughout China, subject to the approval of the Executive Committee of the C.M.M.A.

Handbook on Mission Hospitals.—Dr. Fowler reported that the Council on Hospital Administration had been engaged in the preparation of material for a Handbook on Mission Hospitals. The Council was invited to produce evidence that such a handbook should be published as an official publication of the C.M.M.A. and further particulars as to cost, size, contents, etc., will be required.
It was moved and seconded that in the event of this handbook being accepted as an official publication the Chair appoint a Committee of five to edit it. Carried.

Attention was called to the fact that the free scholarship for training a woman nurse for the Institute of Hospital Technicians offered by the P.U.M.C. has not been filled. The Executive Secretary was asked to write to Miss Simpson, Secretary of the Nurses' Association of China, in regard to it.

Office Building.—There was a discussion on the subject of leasing an office in the new Missions Building. It was moved and seconded that the Association notify the National Christian Council that it desires to have four front rooms on the fifth floor and that inquiries be made as to the terms of the lease. Carried.

National Christian Council.—After a discussion on the question of affiliation of the C.M.M.A. with the National Christian Council it was moved and seconded that the Committee defer action until further information has been obtained. Carried.

Editorial Board.—It was moved and seconded that the President of the C.M.M.A. interview Dr. Earle and personally extend to him an invitation to join the Editorial Board of the "China Medical Journal" with discretion as to the form this invitation should take. Carried.

Research Committee.—The election of Dr. Earle to the Research Committee was approved.

Council on Medical Education.—A report of this council in the form of the minutes of the meeting held in Peking, on June 25th, 1923, was read (See Ch. Med Jour., July, 1923). It was moved and seconded that the recommendation contained in the report as to "The Requirements of Approved Medical Schools" in China be approved. Carried.

It was moved and seconded that the Recommendation in the report as to "The Minimum Standards of Medical Curriculum" be approved. Carried.

It was moved and seconded that the resolution of the Council contained in the same report as to the "Registration of Approved Schools" be adopted. Carried.

It was moved and seconded that the Executive Secretary shall make an investigation of the Schools applying for registration and
report to the Executive Committee, and if it be found that the school comes up to the approved standard it shall be registered as an approved school. Carried.

It was moved and seconded that the recommendation contained in the report of the Council on the "Eligibility of medical schools in China for admission to membership in the Association" be adopted. Carried.

It was moved and seconded that the Executive Secretary shall send reprints from the "China Medical Journal" of the report of the Council on Medical Education to all medical and premedical schools in China. Carried.

It was moved and seconded that the Executive Committee shall pass on the application for membership in the Association of graduates of medical schools in China that are now defunct. Carried.

Council on Public Health.—It was moved and seconded that it be recommended to the next Conference that the name of the Council on Public Health of the C.M.M.A. be changed to "Council on Hygiene." Carried.

It was moved and seconded that Dr. J. L. Maxwell be named as an alternate to Dr. J. B. Grant to represent the Council on Public Health of the C.M.M.A. on the Executive Committee of the Council on Public Health Education. Carried.

It was moved and seconded that the recommendation for appointment of a full time physician for Industrial Medicine be laid on the table. Carried.

It was moved and seconded that the Constitution and By-laws of the Council on Public Health Education be approved. Carried.

C.M.M.A. Finance. It was moved and seconded that the budgets of the various councils be submitted to the Finance Committee and that it bring in a collective budget at the next meeting of the Executive. Carried.

It was moved and seconded that the next meeting of the Executive Committee be on October 12th, 1923. Carried.

There being no further business the meeting adjourned at 5:30 p.m.
To the Members of the C.M.M.A. Association:

The Research Committee needs your co-operation. Will you not help? We shall deem it a favor if you will send in data concerning all intestinal parasites found in your region. If you are gathering such data please notify me at an early date, that you will be prepared to send in your report at the end of each year previous to the C.M.M.A. Conference in 1925.

It is desired to make a beginning on a collection of such parasites. When you come to the next Conference, please bring preserved specimens of the intestinal parasites of your region. One male and one female of each species will be sufficient. Very small animals which are known to serve as intermediate hosts should be preserved and added to the collection, also animal reservoir hosts. The common domestic animals may be easily examined for parasites, also fish, shell-fish, fowls, etc. Data concerning such examinations are valuable as forming links in the chain of infestation.

Case records and clinical reports are of great value. Send us your incidence records of parasitic infestations as well as percentages of the persons infected. The papers will be most acceptable and due credit will be given for all such contributions.

When you are in doubt concerning the species of parasites and ova, specimens may be sent to this Department for identification or diagnosis, and the matter will be given our personal attention. Answers will be given to all questions to the best of our ability.

The blood findings in all parasitic disease are valuable. Most valuable also are data concerning the life history of a parasite, even though papers upon the subject have already been published. The history may differ in your region because of a different environment.

In connection with your collection of data, a short account of the eating and drinking habits of the people would be of great value. A list of foods, especially of those eaten raw, is important. Other important factors upon which information is desired are the distribution and application to the fields of fertilizers, intermediate and reservoir hosts, and whether the disease you are investigating is endemic; if not, where did the patients contract it? Was it by residence in an area where it is endemic?
The data sent by every physician are important, even though the record of only one parasite is sent. If all of us help to the best of our ability we shall have a fine collection at the next Conference. If you wait for others to do their part before you begin, little will be done. Please do all you can in this line of research.

A special note with regard to Fasciolopsis buski with the information as to whether the water-caltrop (菱大) and the water-nut (菱果) are eaten in your region would be highly prized by the writer.

On behalf of the Research Committee,
Sincerely yours,
(signed) C. H. BARLOW.

Hospital Reports.

SHANGHAI: MARGARET WILLIAMSON
HOSPITAL REPORT FOR 1922.

Hospital Staff.—Drs. Love, Lawney, Whitemore, Ingersoll, Polk-Peters, Kraker, King, Brown, Van, and four Chinese women physicians.

In this very interesting report an account is given of the work of Dr. Reifsnyder (1858-1922) who founded the hospital in 1884-1885. Her professional skill was very widely recognized and extended the reputation of the hospital throughout the whole of China. One at least of her operations received world-wide notice and was made a matter of record as a permanent contribution to the history of surgery. "She possessed a strong religious nature and with it a saving sense of humor, both of which helped to carry her through the many trials and perplexities of a busy life". Her photograph and that of the three surviving members of the original hospital staff appear in the report.

During the year 1922, the in-patients numbered 2,380. There were nearly 900 obstetrical cases. Including six Caesarean sections, there were 175 obstetrical operations, the majority having been rendered necessary by the patients' neglect or by the maltreatment of midwives. Of the 126 stillborn infants, 11 were syphilitic. Besides these syphilitic mothers and infants there were 96 other
cases of syphilis among the in-patients. As no woman or girl needing treatment has been turned away because unable to pay the small hospital charges, the staff has to deal with almost every medical and surgical condition. The total financial expenditure for the year amounted to $31,201.50. It is natural to think that a hospital doing such a large and successful work among Chinese would have the hearty, unsolicited support of the wealthy Chinese officials, ex-officials, and merchants who reside in Shanghai. But the Chinese contributions, apart from the sums paid by patients, amounted only to $279.50. Nevertheless, the hospital has paid its way for the year. Money is needed, however, for further equipment and hospital improvements.

CANTON HOSPITAL, CANTON.

In connection with the Canton Medical Missionary Society and the Canton Medical Missionary Union. 87th Annual Report, 1922.


The number of in-patients during the year was 2,565. Of these 1,077 were surgical, 964 medical, and 524 had diseases of the eye, ear, nose, or throat. Operations, 15,306. Sixty were performed for stone in the bladder, 54 being suprapubic and 6 perineal; the youngest lithotomy patient was 4 years of age, and the oldest 72. The surgical and medical work has been very heavy and very successful. A Public Health Service has also been organized, particular attention being paid to the prevention and cure of trachoma and hook-worm disease.

The income from all sources, exclusive of salaries and allowances paid by Mission Boards, amounted to $79,957.55. Expenditures came to $87,030.90; the operating deficit is $35,917.07, and the deficit after all receipts and gifts have been included, $7,073.35. The estimated cost for hospital reconstruction and equipment is $258,000.

The Canton Hospital, established in 1835, is the oldest hospital in the Orient. Its welfare is therefore of interest to all medical missionaries in China and they will learn with regret that it has not yet extricated itself from the very serious difficulties which
threaten its existence. The Board of Directors, acting on the recommendation of the Staff, has proposed that Mission Boards with medical work in the province of Canton should take over the management and control of the institution, for it is said that unless the management is simplified and placed in the hands of those most interested and who are able to maintain and develop it, the institution is in imminent danger of disaster, notwithstanding its excellent staff, remarkable work and strategic position. We must all join in the hope that the re-organisation will be effected and that its exceedingly good work will be established on a satisfactory and permanent basis.

WHAT IS A HEALTH CENTRE?

V. B. APPLETON, M.D., Shanghai.

At the C.M.M.A. Conference last February the Section on Public Health drew up a resolution recommending to the Conference that its Council on Public Health, "in addition to other activities, definitely engage in providing, in co-operation with the Council on Health Education, a program of work which may be adopted by mission hospitals in forming health centres, and in school health work."

The health centre movement is new. In the United States it has come into prominence within the last twelve years. In England it began earlier, but applied only to infant welfare stations. In the United States the health centre idea came from the dispensary. Instead of curing only those who came for treatment, the hospital reached out into a definite area or to a special group to which intensive health service was given. This service includes preventive as well as curative medicine. The health centre offers an unprecedented opportunity to emphasize the constructive point of view for positive health ideals.

The health centre idea has been evolved by public health workers in response to a universal need for a method of securing the practical application of scientific knowledge concerning health and disease to individual cases. Health centres are many and varied in type. They all have in common a general policy of co-operation with other agencies and some form of health education work.
The health centre differs from the hospital in that it is primarily interested in promoting the health of well or slightly indisposed persons rather than in the treatment of disease. It provides facilities for careful physical examination of the most modern and scientific character, the purpose of which is to engage the individual's interest in his own health and to instruct him in the principles of healthy living. Medical treatment is not given in the health centre. When such treatment is necessary the person examined is referred to his private physician or an appropriate dispensary.

The health centre especially makes provision for periodic examination of pregnant women and young children to whom advice is given about personal hygiene. Children are trained in proper health habits. Special groups are given special attention, such as nutrition classes for under-nourished children.

The health centre attacks disease by the early recognition of physical defects. It is imbued with the idea of health conservation and deals in terms of health rather than of disease.

The character and scope of a given health centre are largely determined by the size of the community, the available resources, and the prevailing interest in the project. If a complete program cannot be carried out for an entire community and persons of all ages, it is best to concentrate on a selected group or area and do intensive work for pregnant women and children. Whenever possible, these women are induced to receive proper care at the time of delivery and arrangements are made for them to receive hospital care, through co-operation with the existing institutions. The babies of these women are then followed by a visiting nurse into the home, until they can be brought for periodic examination to the health centre. Other children in the same family are brought to the centre and weighed every month and are given hygienic advice, especially about nutrition, rest and recreation. Vaccination is offered. When children are ill, the mother is given instruction in home nursing and home sanitation.

The physician who has vision and patience to give his time to this type of intensive constructive health work will find that in the long run he has accomplished far more than by merely treating disease. The making of a hospital into a health centre is one of the forward-looking movements of the day.
Current Medical Literature.

ORIGIN OF ENDEMIC PLAGUE.
Zabolotny, Annales de l'Institute Pasteur, June, 1923.

The author states that every year since 1898 there have been cases of plague in south-eastern Russia, with a total of 1,931 to the close of 1914. The Institute of Experimental Medicine at Petrograd has been investigating eighty-one endemic foci during the last three years, and has found that infection of the skin transmits the bubonic form of plague, while droplet infection is responsible for the pneumonic. The plague bacillus survives for six months in winter in human cadavers and animal carcasses. In summer it survives only a month, on account of the putrefaction. Wild rodents are the reservoirs of infection, but camels become infected and can start an epidemic in human beings. The geographic distribution and parasitology of wild rodents are extremely important for the study of endemic plague.

BIOCHEMIC RACE INDEX OF KOREANS, MANCHUS AND JAPANESE.
Fukumachi, Journal of Immunology, July, 1923.

The work of Fukamachi shows that Koreans are of intermediate type (of Hirschfeld), though not far from the Asio-African type. Manchus belong to the Asio-African type. The Japanese belong to an intermediate type that is quite different from that of the Koreans and Manchus. The biochemical race index gradually decreases in Japan from south to north.

TREATMENT OF HEMOPTYSIS.
Weiss, Medizinische Klinik, Berlin, June, 1923.

It is said by Weiss that he has always succeeded in arresting hemorrhage from the lung, even in serious cases, by immediate injection of 6-10 c.c. of 25 per cent. camphorated oil. The patient is kept in bed for two or three days after the last bleeding, and a sand bag or icebag is laid on the side affected to restrict the excursions of the lung. Cold milk, sipped through a straw, is the best food; carbonated waters and carbonated baths seemed to bring on hemorrhage in some cases. A tablespoonful of salt in a glass of water, ingested in fifteen minutes, often proved useful, as also intravenous injection of 10 c.c. of a 10 per cent. sodium chlorid or calcium chlorid solution. The effect wears off in twelve hours. Constriction of the limbs to induce venous stasis, with still
perceptible pulse for two to six hours often served as a valuable adjuvant. No benefit was observed from gelation injections, which are painful. Three tablespoonfuls of a 50:300 solution of calcium chloride should be taken daily from the onset of the hemorrhage. The camphorated oil subcutaneously or intramuscularly is the main reliance; the effect lasts for about twelve hours. He repeats the injection of 6 or 10 c.c. of the 25 per cent. camphorated oil every twelve hours, for a week, gradually decreasing the dose. A single large dose is more effective than when fractioned. Small, recurring hemorrhages can be combated with 0.1 gm. camphor by the mouth three times a day, but injection of 2 c.c. of the 25 per cent. camphorated oil is more effectual.

MENORRHAGIA OF PUBERTY.


Menorrhagia about the time of puberty is most commonly encountered in girls aged from 12 to 16; usually the patients belong to the middle classes and have just commenced collegiate life. With expectant treatment and a fresh-air life the symptoms disappear within the course of a few months. In certain exceptional cases the menorrhagia is grave and progressive, and the resulting anaemia is resistant to all forms of treatment. In these patients physical examination is usually negative; occasionally haemophilia, or abnormalities such as uterus bicornis unicollis have been noted, and in one of the author's patients laparotomy revealed very considerable bilateral ovarian hypertrophy. Irradiation of one ovary so as to produce a temporary partial castration has been recommended for intractable cases; and the spleen has been irradiated, apparently with success, in cases of menorrhagia associated with deficiency in the blood platelets. There is reason for assuming that grave cases of menorrhagia at puberty depend either (1) on a disturbance of the haemopoietic system in connection with the establishment of ovarian function, or (2), more rarely, when there are other associated haemorrhages, such as epistaxis, purpura, etc., on a primary haemopoietic disorder.

TREATMENT OF RINGWORM.


Rapid results in the treatment of ringworm have been obtained with the following method. The hair is cut short, permitting a good examination of the whole surface, the affected parts are shaved, and then washed with ether soap, dried, and the following lotion applied: calomel, 5 grains; tinct. iodi (B.P.) 1 drachm. Stir with glass rod—a reddish precipitate is formed. This lotion is
poured upon small pieces of cotton-wool and applied to the ringworm area by gentle rubbing. The piece of wool is then discarded, clean white lint applied and bandaged. The child returns to the clinic the next day, the dressings are removed, the areas are washed well with ether soap, ammoniated mercury ointment (B.P.) applied, and a bandage again used. This process is continued until cure results, generally within fourteen days; the child is ready to return to school during the third week.

The calomel iodine lotion must be freshly prepared for each case. If rubbed in instead of gently daubed on, within a few hours' time the child suffers severe pain, due to a burn of the first or even second degree; in the first case a mild erythema, and in the second case erythema and small blisters, simulating erysipelas. The best treatment of these burns is to apply a mixture of olive oil 3 parts and castor oil 1 part. The lotion need be applied only once; it seems to penetrate and destroy the parasites, perhaps by the liberation of nascent iodine. The further treatment described keeps the surface clean and rubs out all loose hairs. In several cases a chronic scurfiness continued, but cleared up when the oil application was used. All the 61 cases mentioned have been kept under observation and in no case was there any recurrence.

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**PENETRATIVE POWERS OF ARSENICALS.**

*U. S. Public Health Service, 1923.*

The probable reason why the chances for the complete cure of a generalized syphilitic infection are poor is because the usual remedies (arsphenamine, neoarsphenamine, and silver arsphenamine) all lack the power necessary to enable them to penetrate the infected tissues in sufficient amounts to destroy the last remaining parasites. Other arsencals, sulpharsphenamine, tryparsamid, and 3-amino-4-oxy-phenol arsonic acid, have superior penetrative powers and their use as remedies is suggested.

The report was made by Carl Voigtlin, M. I. Smith, Helen Dyer, and I. W. Thompson, all of the U. S. Public Health Service, after prolonged experimentation, both chemical and bacteriological, on rabbits. While the authors admit that results so obtained cannot be transferred, without reservation, to the treatment of human syphilis, they nevertheless advance several reasons that cause them to believe that a clinical trial of the more penetrative preparations named is strongly indicated.

In conclusion they express, as Ehrlich did, their belief that no matter what arsencal may be used better results will be obtained from single large doses a week apart than from smaller doses given at shorter intervals.
BERI-BERI AND EPIDEMIC DROPSY.

MEGAW, Indian Medical Gazette, May, 1923.

In this paper the author discusses the origin and prevention of the great variety of manifestations included under the term "beri-beri," many of which are possibly distinct conditions. The vast majority of cases occur among persons who eat overmilled rice, and the disease practically never affects those who do not eat rice in some form. He does not consider that the vitamin B deficiency theory can explain every type of case, but admits that some of the conditions met with may be of the nature of an avitaminosis, and that this theory cannot altogether be excluded. On the whole he inclines to the view that some form of food intoxication (possibly analogous to botulism) is the factor of greatest importance in the production of the different conditions encountered. The train of symptoms and the post-mortem appearances support this opinion. As the disease is known to be associated with the eating of old rice and to disappear when fresh rice is supplied, it is possible that it may be due to changes occurring during storage, whether in nutritional value or in the formation of an active poison. It occurs, too, among families subsisting without any obvious change of diet, which also supports the food intoxication theory, and leads the author to suggest the possibility of an accidental infection of rice by microbial agents. No cases have been known to occur among persons partaking of new and parboiled rice. There is extremely scanty evidence of any infectious element. Referring to measures of control and treatment, the author emphasizes the need for an appreciation of all the possible sources of origin, and puts forward the following necessary considerations: attention to hygiene, cutting off of the supply of rice on the occurrence of an outbreak, restriction to parboiled rice at ordinary times, and the provision of a diet which will fulfil body needs according to the standard of modern dietetics. Special attention, moreover, should be paid to the conditions of storage of all rice consumed. As the disease does not appear to be infectious, no anti-epidemic measures are necessary. The author advocates further research on the conditions of occurrence and the reasons for the variations in the different types of the disease.

THE BLOOD IN MALARIA.

GARIN and AFFRE, Lyon Medical, April, 1923.

The authors of this paper record observations on the blood in a series of cases of malaria. Dealing with the red corpuscles, they find that these are the first elements to react to the infection. They
note poikilocytosis and anisocytosis (inequality of diameter between different corpuscles), the latter particularly in prolonged attacks and in cases of severe anaemia. Specially large corpuscles appear beside very small ones, indicating active regeneration. Haemoglobin was practically normal, although this observation is not in agreement with the views of other investigators. A constant diminution in the number of red cells was found, but it was extremely variable in degree. It yielded rapidly to treatment, particularly at high altitudes, where, in some cases, the normal was exceeded, but the numbers fell again by about a million per cubic millimetre on return to lower levels. In individuals who had spent prolonged periods in malarial regions both the red cell count and the haemoglobin index were found to be below normal, even after two years' residence in a European climate and despite the absence of parasites in the blood. Reviewing the work of different observers, the authors are of opinion that the globular resistance of the red cells is increased in malaria, especially between the attacks. They regard this as a defensive effort against the parasite. Among abnormal forms basophil granular types were found to be frequent (said by Plehn to be diagnostic) and filamentous modifications were never absent, and were more numerous after an attack. On the other hand, nucleated red cells were extremely rare. In regard to the white cells, the authors dispute the generally accepted presence of a leucopenia. On the average, in some thousands of cases, an increase of 800 leucocytes per cubic millimetre accompanied the attack, and often there was even a hyperleucocytosis, though this was relatively small and of short duration. In a comprehensive series of differential counts there was a constant increase of mononuclear cells, more marked in the interval between attacks; there was also a very slight increase in eosinophils, whilst the onset of an attack coincided with an increase of neutrophil polymorphs amounting to almost 1,000 per cubic millimetre—about five times the increase observable in mononuclear white cells. This was detectable in the hours preceding an attack and fell again during the course of the latter, and the authors consider it as of equal diagnostic value for preventive treatment as the actual presence of the parasite in the blood. Other forms observed were myeloid (7 per cent), especially granular myelocytes, rarely myeloblasts. The presence of melanotic leucocytes is described as being rare in primary malaria, but frequent in chronic cases. It is probable, suggest the authors, that malarial blood contains substances antagonistic to the haemolytic action of the parasite—a possible form of immunity. The suggestion is put forward that a study of the reactions of deviation of complement might prove of value from a diagnostic point of view, although so far investigation has been fruitless. In conclusion, the authors note the marked discrepancy in results obtained by the Wassermann reaction as seen in malaria.
DIFFERENTIAL DIAGNOSIS OF GALL-STONES AND GASTRO-INTESTINAL DISEASE.

MEULENGRACHT, Ugeskrift for Laeger, May 10th, 1923.

The author questioned 128 patients who had been operated on for gall-stones in the period 1913 to 1922, as to the date when their gall-stones were first diagnosed. Only in 31 cases had they been diagnosed early in the disease, and in as many as 63 cases the original diagnosis had been some gastro-intestinal disease. In most of these 63 cases the duration of this mistake was a matter of several years. The most common mistake was the diagnosis of "gastric catarrh". The questions addressed to these ex-patients elicited the facts that in none had dyspepsia occurred by itself, without a history of biliary colic; that in 75 cases there had been dyspepsia in the intervals between the attacks of pain; and that 53 patients had felt perfectly well during these intervals. The most common symptom was a sense of distension, discomfort, and pressure immediately after meals.

PRESERVATION AGAINST TYPHUS.


Three simple means of preservation against typhus proposed by Brunet are: (1) Soap containing oxycyanide of mercury, 20 in 1,000, which can be used in fresh or in salt water.
(2) Soap containing 250 parts of petrol per 1,000.
(3) Sion lotion, composed of terebenthinated oil (of one-tenth strength) 100 parts, camphorated oil (one-tenth) 100 parts, vinegar 100 parts, petrol 200 parts.

THE LEUCOCYTES IN HEALTH AND IN DISEASE.


Fairley gives a good general review of our present knowledge of the physiological and pathological activities of the white blood corpuscles. In the light of recent work which has been conducted in various countries throughout the world it would appear that the usually accepted blood formula must be modified. Instead of the polymorphonuclear cells being present in three times the number of the mononuclears, it is probable that in the normal blood they show not more than a slight excess. The average for a large number of estimations gives a relative proportion of 54.0 per cent. for the polymorphs and 43.3 per cent. for the mononuclears. But it is important to remember that in the individual case such wide variations may be found that little significance can be attached to the average. Of far greater value in the interpretation of the single blood count is a knowledge of the normal variations above and below the mean. These variations, the author points out, are
greater than is usually supposed. He regards the normal physiological variation of the total leucocyte count as lying between 4,500 and 15,000 per c.mm.; the relative proportion of the polymorphonuclear cells is probably between 30 and 80 per cent. Failure in the past to realize the possibility of such a low polymorph percentage as 30 being compatible with normality has been responsible for the erroneous interpretation of high lymphocyte counts in healthy persons.

CHRONIC NEPHRITIS.

VAN LANGENDORFCK, Le Scalpe, June 9th, 1923.

The author reviews the symptomatology and treatment of chronic nephritis in the light of recent advances. He discards the old classifications—"large white" and "small red" kidney, or "parenchymatous" and "interstitial" nephritis—remarking that the last is the final stage of every chronic nephritis; the renal cells are first destroyed by a chronic process and the connective tissue remains because it is more resistant than the epithelium. It is more reasonable, he suggests, to classify these cases in accordance with the clinical aspect of the symptoms. These are dominated by two phenomena, theoretically distinct, but which actually are very often combined either at the origin or during the progress of the disease: the retention of sodium chloride and the retention of certain waste products, the principal of these being urea. The first gives rise to dropsical nephritis, the second to the uraemic type, of which the complex manifestations are due to renal or cardiac changes and also, possibly, to the retained waste products. The mechanism of this retention has not yet been discovered, but it is certain that the kidney possesses dissociated powers of elimination for salts and for urea. It is evident that the functional derangement is greater in the uraemic than in the chloride-retaining type of nephritis. The author gives minute directions for the determination of the excretion of chlorides and urea, and for the estimation of the blood urea. The medicinal treatment of chronic nephritis is, he says, valueless; we must be content to supplement as far as possible the renal insufficiency and to stimulate the heart. The patient's dietary is more interesting; it should consist of articles which will not interfere with urinary elimination, and will yet maintain the general nutrition. If the patient is confined to bed, about 75 grams of protein, 30 grams of fats, and 275 grams of carbohydrates will suffice. This dietary produces 1,800 calories, but that is clearly insufficient if the patient does any work; it will then be necessary to augment the dietary, especially in regard to non-albuminous foods, in order to approach, as far as possible, a normal dietary, which requires the ingestion of 100 to 110 grams of protein, 50 to 60 grams of fats, and 400 to 500 grams of starchy foods. In prescribing a "low nitrogen" diet, it is necessary to
study the albumin content of the chief foods, and also their calorific power, and the quantity of salts contained (Gautheir's tables are appended). Generally speaking, one may order potatoes, rice, fats; butter and oil provide many potential calories, with little or no nitrogen. Nuts, arrowroot, peas, beans, carrots, and fruit are equally valuable. Milk in moderate quantity (a milk diet may nauseate the patient), bread and pastry may be permitted, but the two latter articles should be "salt-free". Meat, fish (especially sea-fish), and eggs should be forbidden. If the symptoms of urea retention are in abeyance, the patient may be permitted, every two or three days, to take a small quantity of meat or an egg, in order to vary the monotony of a diet which may be permanent. If the patient's condition improves a larger quantity of meat, eggs, and fresh-water fish may be permitted. Lentils should be forbidden. If these are borne, the patient may be allowed to add 5 to 10 grams of salt to his food, but this must be withdrawn if any oedema appears. This dietary should be revised from time to time if necessary and the quantity taken carefully watched, as patients or their families often endeavor to supplement the quality of a dietary by increasing the quantity. This is often accompanied by increased ingestion of liquids, resulting in a rise in blood pressure due to overloading the stomach. The patient should be instructed to drink after or between, but never with meals.

THE VALUE OF DRUGS OF THE MORPHINE GROUP IN RELIEVING COUGH.

HECHT, Klinische Wochenschrift, June 4th, 1923.

The author records the results of clinical observations which he has made in order to determine the value of various derivatives of the morphine group in relieving cough. Codeine is more satisfactory than morphine for the relief of cough, since it is not generally narcotic in its action and does not lead to the formation of a drug habit. It is the most useful of all drugs for the relief of cough and does not produce bad after-effects. Severe paroxysms of coughing are often arrested by a sufficiently large dose of codeine (0.05 gram), and the drug can be discontinued without difficulty. The author has tried to find a more powerful and cheaper substitute for codeine. He describes the precautions necessary in testing clinically the value of drugs for relieving cough, and the class of cases most suitable for observation. Paracodeine and dionin were found to be less effective than codeine. But from his observations the author considers that "dicodid" is at least as effective as codeine and is more effective than paracodeine and pantopon. It is preferred by the patients and produces a definite feeling of well-being; but in time a drug habit is formed and there is difficulty in getting the patient to return to the use of codeine.

The meeting on July 12th was held in the Canton Hospital. The President, Dr. W. W. Cadbury presided. The devotional exercises were led by Dr. C. A. Hayes.

Dr. Wright spoke concerning "The relation of the Chinese Christian Church to the Mission Hospitals". Medical work is a means to an end, namely evangelism, since the spirit is the essential part of man. Medical work is also, however, an end in itself. Both soul and body were created by God and both participate in the resurrection. Christ gave special attention to the body, its needs and healing. The training of physicians is important as a calling, equally with that of evangelists. The hospital staff should take the initiative in interesting the Christian church in the work, needs, and opportunities for service in the hospitals. Scholars should be given instruction along these lines. The churches should have a poor fund to help in the care of their sick members. Seek and take the advice of the church in developing hospital work and adapting it to the needs of the church. The advantages of a close relationship between the church and hospitals are mutual and great in the upbuilding and strengthening of both.

In the discussion the following points were brought out. The Church should realize that it has a duty to cooperate in home missionary work, including that of the medical branch, equally with the Church abroad and foreign missionaries. All missionary work should contribute directly towards the upbuilding of the Christian Church in China, which must be given, and take a share in, the control and administration of medical institutions. The church should be educated as to the value of modern medicine, and poor relief committees should be organized. The school children should especially be taught the advantages and obligations in medical work and service. The Church must learn by its own experience, and be given the opportunity to do so increasingly as it is able. The primary work of missionary institutions, including medical, is to preach the Gospel. In this it differs from ordinary hospitals. Our ideal should be to make Christians of all patients and medical missionaries of all medical students. The Chinese church should shoulder greater responsibility in this work.

Dr. J. O. Thomson read a paper on the "Treatment of Vesical Calculus", based upon a review of the results of operations performed upon
3,136 cases of Vesical Calculus in the Canton hospital with personal observation in nearly 600 cases. The cases were separated into three groups, namely, early cases which include about 15 per cent of cases admitted; average, about 25 per cent of cases; and cases advanced, complicated, and those at the extremes of life, which include the majority of those treated. The appropriate treatment for the different types of cases and the technique were explained. There was considerable discussion, especially in regard to the best methods of treating advanced cases. The meeting then adjourned.

In the afternoon Dr. Kirk reported concerning the tentative program for the next conference of the C. M. M. A. Three days will be devoted to business of the Association, and three days to scientific papers and discussion. To these meetings non-missionary medical men of approved status will be welcome. In regard to the meetings of the Council on Medical Education and of the Executive Committee, he reported on the proposed standard and curriculum of recognized schools, and on the establishment of an Institute of Hospital Technicians for which the Wesleyan Missionary Society will be requested to offer the services of Dr. George Hadden. It is also proposed to change the Constitution of the C. M. M. A. in order to admit all medical men of recognized standing, foreign and Chinese, who accept the code of medical ethics of the American and British Medical Associations.

Notes on two cases of aneurysm treated by Dr. B. Randall Vickers were read (for report of these cases see Ch. Med. Jour., September, 1923).

Dr. Hayes discussed fully the subject of "Cataract Extraction," especially in regard to treatment. Dr. U. K. Chan, assistant ophthalmologist, also spoke at length on this subject which was then discussed generally.

The remainder of the meeting was held in the operating rooms of the Canton Hospital where clinical cases were demonstrated by the Hospital Staff.

Dr. Thomson showed an advanced case of vesical calculus, an old man with hypertrophied prostate, cystitis and pyonephritis; also cases of splenomyelogenous leukemia; perforated pyloric ulcer adherent to the liver in which a posterior gastroenterostomy had been performed; arthroplasty of elbow joint for old fracture dislocation; and gunshot wounds of the abdomen, head and brain, spine, nerve injuries in which tenoplasties had been performed, traumatic aneurysm; and erysipelas cured by typhoid vaccine.

Dr. Hayes showed cases of cataract which had been successfully operated upon; in a number of these the wound flap was sutured.

Dr. Wright showed a case of tuberculosis of the second cervical vertebra or axis.

Dr. Reynolds presented an obscure case of head pain and a case of malignancy of the uterus.
Dr. Harvey followed with a demonstration of many fine radiograms of gunshot injuries and other diseases and conditions. The meeting then adjourned.

The members of the Branch reassembled at the Hackett Medical School on July 13th, at 10 a.m. Dr. Cadbury presided. The devotional Service was led by Dr. J. C. Thomson. A number of interesting cases of hysteria and of cardiac disease were then exhibited by Dr. Hoffmann and Dr. M. Wong. The guests also inspected the very fine new dormitory building. The meeting reassembled in the afternoon.

Dr. M. Wong gave an interesting talk on the subject of "How can missionaries be of most use to China during the next Decade?" (For report see *Ch. Med. Jour.*, October, 1923).

In the subsequent discussion the following points were noted: Chinese should not consider foreign countries as wholly Christian and follow their example at all times. It is character that will save China. It was medicine and not guns that opened China to the influences of Christianity. Medicine knows no nationality. Creed and conduct should go together; show kindliness and a Christian spirit.

The question, "Shall we change our C.M.M.A. Constitution?" was next brought up for discussion. It was suggested at the last Conference that the name, "China Medical Missionary Association" be changed to "China Medical Association" in order that all Chinese and foreign physicians practising in China and adjacent territories, who are graduates of high standard schools and who subscribe to the Code of Ethics of the American and British Medical Associations, may become members. The discussion was led by Dr. Cadbury who pointed out the following advantages and disadvantages. There would be increased membership and therefore increased influence, especially as there would be only one medical association. The adherence of such a large body of physicians to a high ethical code would elevate medical practice in China, prevent unethical practice and eliminate unethical physicians. Since the large nucleus would consist of missionary physicians the principles of the C.M.M.A. would influence the whole medical profession of China. The C.M.M.A. would be a section of the China Medical Association. The disadvantages are the possible inclusion of members who might be able to secure the important positions and lower the scientific standards of the Association. The attitude of the National Medical Association, an exclusively Chinese organization, to the proposed change is important. In the further discussion of the question it was mentioned that some action would have to be taken to prevent the organization of another National Medical Association should the present one become part of the "China Medical Association." Probably there may be also amalgamation of the medical journals of the two associations, so that the members of the National Association would have wider publicity for their articles in the larger Journal, which will have both Chinese and English editions or sections with abstracts of the papers appearing at length in the.
other edition or section. Since there is no official Code of Medical Ethics in China, and no organization similar to the General Medical Council in Great Britain, such an organization as the proposed China Medical Association would exert a desirable influence along these lines. It was decided to bring up the subject again at a later meeting.

Dr. Hoffmann led a discussion on the subject of splenomegaly mentioning the different varieties seen in South China, which are the malarial spleen, Banti's disease, splenomyelogenous leukemia, and the enlarged spleens which are seen in acute diseases. The diagnosis and treatment were described. He also outlined the present knowledge and the functions of the spleen. It was questioned whether Banti's disease is a form of hereditary syphilis. Treatment by operation, splenectomy and by Röntgen rays and radium are essential.

The third day's meeting and clinics were held at the new Kung Yee Hospital, on the 14th of July at 3 p.m. The devotional exercises were led by Dr. Todd.

The minutes of the meeting of May 10th were read and approved. Mr. L. C. Huey was elected an honorary member. Dr. S. F. Lee was proposed as an active member of the Branch.

Dr. Kirk proposed that the Christian churches of South China be urged to arrange for a Hospital Sunday, in order to remind the Chinese Christians that the care of sick and suffering is an integral part of the Church's work; to give an opportunity to the Churches to support financially the Christian hospitals in the city; that it is such hospitals which the Church feels can be relied upon to conduct their services in the spirit of Christ, and to bring before the young men and maidens of the Christian Church in Kwong Tung the great call to service in the medical and nursing professions. It was decided to send a communication to the City Christian Council of Canton proposing that they arrange for such a Hospital Sunday, on which occasion the work and needs of the hospitals may be explained, a call to the young to such Christian service be given, and funds for the hospitals be secured.

Owing to ill health the resignation of Dr. Roscoe Etter, the secretary-treasurer, was accepted with regret, and Dr. J. O. Thomson was elected.

It was mentioned to the members that American medical missionaries may now become associate fellows of the American Medical Association.

Dr. Dobson then led a discussion on the subject, "What constitutes a case of Leprosy?" The reference was mainly to early or peculiar cases from which the bacillus cannot be isolated. Dr. Dobson traced the history of our knowledge of leprosy from Moses through the middle ages. The disease is not hereditary, but has a geographical distribution, is seen in the second decade of life chiefly, but also in the aged who live in filthy surroundings. It is interesting to compare leprosy and tuberculosis. The
germs take the same stains, at first were not easily cultivated, are very similar in appearance, the lesions have the same extensive distribution with ulceration and nerve lesions and cach is essentially a disease of mankind. As diagnostic signs of leprosy the following are most important: anesthetic patches of skin of bronze color, no hair and which do not sweat; nodular nerves and thickening of the ear lobes. Of course the finding of the bacillus in the nasal secretion confirms the diagnosis. The disease requires to be differentiated from malaria, beri-beri and ring-worm. In the discussion it was questioned whether the lesions of leprosy are invariably symmetrical. The Chinese silver furnace test (kwok ngan lo), as practiced by the old Chinese medical men was mentioned. When heated, the heat waves of a silver furnace are supposed to show up the leprous skin patches as different from the surrounding skin and from all other diseases of the skin. The possibility of bad fish from the fish ponds near leper villages being the carrying agent of the disease was considered.

Dr. Kirk submitted notes on “Two-stage operations, their Advantages and Disadvantages.” Such operations are specially useful in fungating tumors of the breast with axillary adenitis, in carcinoma of the rectum, acute intestinal obstruction, for hypertrophied prostate, carcinoma of the tongue with submaxillary adenitis, lymphosarcomas of the neck and in war surgery.

The meeting then went to the operating room where a series of cases of intestinal obstruction were shown by Drs. Todd, and S. F. Lee. Several cases of ligation of the lymphatic duct for infective conditions such as peritonitis and angioma of the neck, as performed in Toronto, were shown. The meeting then adjourned.

**Book Reviews.**


This is a book which can be confidently recommended to all ophthalmic surgeons. Even the most experienced will read with pleasure the work of a master, and to the less experienced it will be a help of the greatest practical value. Operations are described very fully and lucidly with all their possible complications and mishaps and the accompanying illustrations are all that can be desired. Operations for cataract, glaucoma, etc., are of course given in detail, but it is not often that we meet in books of this size on diseases of the eye such very helpful descriptions as are here given of the minor but often very troublesome operations, such as excision of the lachrymal sac. Indeed the descriptions are so very clear that the operations may seem to the inexperienced exceedingly simple and easy to perform.
In an interesting introduction the author discusses the training of the ophthalmic surgeon. As a condition precedent it is held that a thorough preparatory training in general surgery and in the whole science of ophthalmology is requisite both for diagnosis and treatment. Instruction by an expert in the performance of operations is the key-stone of ophthalmic study, and the pupil should possess a certain natural aptitude for the art. "The first few operations are always decisive as to whether the student will become a useful surgeon or not. It is a mistake to believe that, in order to become a proficient, some must perform a few dozen operations and others, less skilful, perhaps many more. He who after the first few cases fails to carry out his work well, may withdraw his hand from this branch forever."

But the average man need not be discouraged. Constant practice on the eyes of pigs and other animals is recommended to enable him to acquire the necessary skill. "He who has learned to perform operations on these eyes with skill, will do so equally well on the human eye, and, on account of its smaller size, will find his task decidedly easier. In this and other ways, "the great majority of students may be trained to become quite useful surgeons; but perfect mastership is attained only by the few." The book is written mainly for the instruction of those who have already obtained a fair grounding in surgery in general, and in ophthalmic surgery in particular.

The dedication has a deep and pathetic meaning for those who are aware of the trials passed through by the medical profession in Austria, especially in Vienna during and after the war: "Dedicated to the Rockefeller Foundation with Feelings of the Deepest Gratitude for the Magnificent and Noble Support which, in the Years of Distress, it granted the Medical Faculties of the Austrian Universities."


The classification of bacteria presents many difficulties. The first was based on morphological characters. As knowledge concerning these organisms increased this classification was found unsatisfactory. Next, an interesting attempt was made to classify bacteria on a physiological basis, then on morphologic, biologic and biochemic characters. Then a committee of the Society of American Bacteriologists issued a few years ago (1917-1920) a working classification based on morphologic and biologic characters. This possessed many advantages, but it was confined to Families, Tribes and Genera. The object in compiling the present Manual is to make this system of greater value to students by extending the classification to the individual species of the genera that have been recognized as valid by the Committee. Further, the more common species of each genus are described in brief form, giving their most important characters.

If this new classification and nomenclature is generally accepted not only by botanists but also by the medical profession it will necessitate many changes in medical text-books. The familiar abbreviation, "t. b.", must disappear completely as the organism causing tuberculosis in man is now *Mycobacterium tuberculosis* (hominis) (Koch) Lehmann and Newmann. The diptheria bacillus is *Corynebacterium diptheriae* (Klebs-Löffler); the cause of Malta fever is *Alcaligines mclltensis* (Bruce); the bacillus of leprosy, *Mycobacterium leprae* (A. Hansen); Friedlander's pneumobacillus,
Encapsulatus pneumoniae (Friedlander); Bacillus coli communis is changed to Escherichia coli (Escherich) Castellani and Chalmers; Bacillus welchii is now Clostridium welchii (Weich and Nuttall); the bacillus of typhoid fever, Eberthella typhi, and so on with nearly all the bacteriological terms with which the general practitioner is familiar. Of course the new nomenclature is far more scientific, but for a time the change of names will be confusing. We suggest that in the index the old names should be given as well as the new.

The Manual will be of the greatest value to all engaged in bacteriological work, especially those engaged in original research. It is intended to keep the work well up-to-date. As additional species are studied in detail and the results published, they can be added to the lists contained in the present work.

Tubercle Bacillus Infection and Tuberculosis in Man and Animals:—

It would be difficult to find a man better prepared to write on "the scientific principles on which to base a world-wide "campaign against the most terrible of human infectious diseases (tuberculosis)" than Prof. Albert Calmette, who has made a life-long study of this disease; and during the last twenty years has made many valuable contributions to our knowledge of it. Since tuberculosis enters so largely into the daily work of most clinicians in the Orient, they will find this book of great value.

Success in dealing with tuberculosis can only come through a thorough understanding of the sources and routes of infection, and of the essential pathology of the disease. In the past, there has been much shifting of emphasis concerning the first point. Calmette, with others, has long insisted that infection by way of the digestive tract is by far the commonest and most important route. The accumulating evidence of recent years has done much to strengthen confidence in this belief. For example, it is now fully accepted that micro-organisms in numbers pass through the intestinal mucosa during digestion and can be found for hours afterward in the lymph and the blood. And what is vitally important in its bearing upon childhood infection is the fact that the younger the animal, the more permeable is its intestinal wall to bacteria.

In contradistinction to the view of Cohnheim, which dominated the field for years, the modern conception regarding tuberculous infection is that it first occurs unobtrusively, and unless effected in massive form, remains latent in the lymphatic or vascular systems for a longer or shorter time. It is only after a varyingly prolonged period of latent blood or lymphatic infection that a primary tuberculous lesion is produced. Anatomical structure, or physiological, mechanical, or accidental circumstances determine where this primary localization occurs. The very nature of this tuberculous infection, in which a waxy coated bacillus is rendered more impregnable by being enclosed in a non-vascular tubercle, has led investigators to place the more stress upon how to obtain natural immunity and upon the processes of immunization. It is felt that this gives the only hope we have of successfully coping with the Great White Plague.

Calmette gives an extensive review of the work that has been done in the line of artificial immunity. There are a few animals, among them a
rodent, the gerbille, that are naturally refractory and non-tubercularizable. Upon being infected, the tubercle bacilli remain in their body tissues and fluids as a harmless foreign body. It is a tolerance of this sort which specific immunity should aim to produce. Antituberculosis serotherapy has up to the present proved valueless. In the scattered instances in which benefit has been reported, it came probably from the small doses of tuberculin the sera contained. Out of the multitude of attempts made to produce immunity by the use of tubercle bacilli, which had previously been injured or modified by treating with heat, light, chemicals, etc., only inconstant results have been achieved. Calmette and his associates of the Pasteur Institute are much encouraged over the success thus far obtained through vaccinating with living tubercle bacilli that have been grown on bile-saturated media.

The concluding portion of the book is devoted to a summary of what the author considers the fundamental things which in the future should dominate the whole prophylaxis against tuberculosis. It is impossible, he considers, to visualize the control of tuberculosis and its ultimate extinction, except by vaccination of all susceptible human beings and animals. In the meantime, in view of the fact that not only all children but also all adults who have not had a previous infection offer a tubercularizable soil, efforts should be concentrated against introduction of infection and especially against frequent and abundant infections.

There are twenty-five excellent full-page color plates which greatly enhance the value of the book.

A. C. Selmon.


The study of the development of the human body is of great interest in itself, and to the medical student is of special value as it lays the foundation for the proper understanding of the facts of anatomy. Unfortunately, the study of anatomy is often made dry and difficult. The author of this manual contends that part of the difficulty has been due to a lack of information regarding the causes which have determined the structure and relations of the parts of the body, for without some knowledge of the why things are so, the facts of anatomy stand as so many isolated items, while with such knowledge they become bound together to a continuous whole and their study assumes the dignity of a science.

In this edition, the seventh, has been incorporated the results of all important recent contributions to the literature on the subject. At the end of each chapter there are numerous bibliographic references to aid further study. The book is well illustrated. With practical work in biology and careful study of models, it should enable the student to acquire a well grounded knowledge of this branch of science.

Peking Union Medical College.—Addresses and Papers: Dedication Ceremonies and Medical Conference, September 15-22, 1921. Peking, China, 1912.

All physicians who are interested in the practice and dissemination of scientific medicine in China, and in the Peking Union Medical College and Hospital which has done so much to raise the standard of hospital work and
medical education both by example and practical help to other medical institutions, should endeavor to obtain a copy of this very handsome volume. To those who were present at the ceremonies described it will always be a source of pleasure. Many of the papers are of permanent medical or historical value; we do not review them as notes and abstracts of nearly all appeared in this Journal last year. The illustrations of the fine buildings, within and without, are excellent. Missionary doctors hampered in their work by inadequate hospital accommodation and insufficient equipment can magnanimously rejoice that in at least one place in China things are as they should be in hospital and medical school. The price of the book is not given; perhaps it is not for sale.

The Tsinan Medical Review.—Vol. III, No. 4, October, 1923. Published by the Medical Department of the Shantung Christian University, Tsinanfu.


China Inland Mission:—Health Pamphlet. No. IV. Maternity.

By the courtesy of Dr. D. M. Gibson, of Kaifeng, we have received a booklet on “Maternity,” the fourth in the China Inland Mission series already noticed (Ch. Med. Jour., August, 1923).

In China where mission stations may be at immense distances from foreign hospitals and where travelling is slow, difficult and often dangerous, it is most important that all wives of missionaries should possess at least an elementary knowledge of the precautions that should be taken during the months of pregnancy. At the same time, there should be no needless fears. In stating the purpose of the pamphlet, the author writes: “Much needless anxiety has been caused, and, moreover, lives have been lost owing to the lack of appreciation of a few simple facts in relation to the process of child-bearing. The following points have been collected together with the double purpose of allaying anxiety and averting danger for those who are undertaking the sacred duty of motherhood. This manual is in no sense a treatise on the subject and for detailed information reference should be made to medical books.”

The principle paragraphs relate to general hygiene, excessive vomiting, toxaemia, performance of tests for albumin, pelvic obstruction, hemorrhage and other subjects. All the pamphlets in the series are very suitable for distribution among non-medical missionaries.


While lecturing on Bacteriology to nurses in various hospitals, the author found that the text-books on this subject intended for nurses were unsatisfactory. He has therefore prepared this volume which represents with additions, the syllabus of lectures he delivered at the training schools.
The China Medical Journal.

It is written in simple language, and all difficult terms are defined in the text. Stress is laid on the "Modes of Infection, Disinfection and Prophylaxis," as the author holds that it is most important that nurses should be given explicit instruction on this point. The book is not only for nurses actually engaged in attending the sick, but also for those capable of serving as laboratory assistants and technicians. In this second edition there is much new subject matter. In the hands of a good teacher it should serve a very useful purpose.

The Quarterly Journal for Chinese Nurses.—Published by the Nurses' Association of China. October, 1923. Editor, Esther Love, Hwai Yuen, Anhui; Business Manager, Cora Simpson, 10 Quinsan Gardens, Shanghai.

Among the special features of this number, are Miss Nina D. Gage's thoughtful article on "Leadership in Nursing;" Miss E. Stedman's on "Hospital Social Service in China;" and the continuation of Dr. Lee S. Huizenga's paper on "Ethics," the present instalment being on "The Nurse's Duty to Herself." There are one or two medical papers, and various announcements and items of news of interest to nurses in China. The second part of the number consists of a translation of the contents into easy Wenli. Every physician in China should encourage his nurses to read this Journal; better still, they should subscribe to it regularly.

Fenchow.—The name of the city is the very compendious title of the paper issued by the American Board missionaries in Fenchow, Shansi, whose work seems to be mainly supported by Oberlin University. Among the articles of varied interest is one written by Dr. Clara A. Nutting on "A Visit to a Buddhist Sanctuary," and Dr. Percy Watson has a paper on "Hospital Bonds," in which he refers to the value of hospital work as a spiritual investment. One sentence is well worth quoting: "The relief of suffering is not the greatest service of the Mission Hospital. It is to teach that God is not a disease-sending God nor the spread of a contagious disease the work of invisible devils. As disease has little by little been conquered by the fearless and unselfish sacrifice of men who gave themselves for the welfare of others, so likewise must we face the social and economic ills of our day."

The other articles are also very good and there are several illustrations. One is a photograph of the kitchen committee with a "heavy-weight" as chairman, an excellent appointment, as it gives the assurance that somewhere or other there is abundant "corn in Egypt."


This is a brightly written, illustrated missionary periodical covering all departments of missionary work including the medical. It states that a new hospital is in course of erection in Kachek and of course there are many obstacles to be overcome. "The big problem in hand is to get stone for concrete. There is no stone nearer than three miles, and as we have no wagons or motor trucks, and no roads if we did have them, the stone must be carried." Formerly the price for carrying 133 lbs. of stone this distance was 135 cash (6 cents, U. S. currency). Now the price has been raised to 180 cash (8 cents). Missionaries who have to contend with the wiles and "squeezing" of Chinese builders elsewhere cannot but sigh with envy as they think of the modesty of these stone-carriers. However, all in the mission seem very happy, so much so that two of its members have written poems for the magazine, undaunted by the difficulty of finding appropriate words to rhyme with "Nodoa" and "Hoihow".
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.

Treatment of Kala-Azar.

To the Editor, C. M. J.

Dear Sir,—I think it will be of interest to those who are treating kala-azar patients to know that Dr. Muir's little handbook on this disease has been re-written and is now published under the joint authorship of Napier and Muir.

This book sums up in an admirable way our knowledge of the diagnosis and treatment of this condition.

Yours truly,

E. B. Struthers.
Tsinan, October, 1923.

Large Vesical Calculus

To the Editor, C. M. J.,

Dear Sir,

A vesical calculus removed from a patient by suprapubic cystotomy in the Van Norden Hospital, Linchow, in June, 1923, was of such unusual weight and size as to be worth reporting. The stone weighs 17 1/4 ounces and measures 10 1/2 x 10 x 9 1/4 inches in circumference. It is ovoid in shape, smooth for the most part, and composed chiefly of phosphates. The patient was a man 53 years old and a native of this district. An interesting feature of the case was that he had no urinary symptoms of any kind until about one month before operation.

Sincerely yours,

Herbert A. Judson.
Linchow, Kwangtung.
October 4, 1923.

Ocular Therapeutics: A Correction.

To the Editor, C. M. J.

Dear Sir,—In my article on "Ocular Therapeutics" in the last (October) issue of the Journal, in writing on the use of milk in the treatment of certain eye conditions, I referred to the technique of its use as seen in Vienna by Dr. D. V. Smith of Peking. To correct the conception that I had formed of this technique, Dr. Smith writes as follows:

"I was sorry to note that our hurried conversation on the train en route to Nanking had failed to give the correct information regarding the Vienna method of milk injections. Please let me state it correctly. Boil skimmed milk for four minutes from the time that it first begins to 'rise.' Allow to cool.

First day.—Inject ten cubic centimeters in gluteal muscles. This is the adult dose. For children or babies, the dose is one, two, or three cubic centimeters according to age and physical condition. This is followed in from one to six hours by a distinct reaction of chill and fever. The temperature often goes as high as 103° F. or 104° F.

Second day.—Wait one day for recovery from reaction.

Third day.—Inject fifteen cubic centimeters as before.

Fourth day.—Allow patient to rest.

Fifth day.—Inject twenty cubic centimeters as before.

If three injections do not help the condition, it is not usually worth while to continue them."

I would be very glad if you would pass this correction on to the readers of the Journal.

Sincerely yours,

R. A. Peterson.

Chinese doctor wanted in Mission Hospital.—A missionary physician in province of Kiangsi wishes to obtain for the hospital the services of a good, reliable Chinese doctor, and also wishes to obtain a position for the Chinese doctor now leaving. Address, Executive Secretary, C. M. M. A., P.O. Box 1121, Shanghai.
**NEWS AND COMMENT.**

**BIRTH.**

Smyly.—To Dr. and Mrs. H. Jocelyn Smyly, of the Peking Union Medical College, on October 25th, 1923, a son.

**DEATH.**

Maddren.—On November 5, 1923, at the Isolation Hospital, Shanghai, Elizabeth Coulson, beloved wife of Dr. Russell Maddren, late Yale Hospital, Changsha, aged 27 years.

**Journal losses in Chinese Post Office.**—The editor regrets to say that during the last two months many letters, manuscripts and proofs sent to the Chinese Post Office have not reached their destination. Probably the stamps were stolen and the papers destroyed. A Chinese official has been making inquiries. Not being a “Sherlock Holmes” he thinks the case is hopeless. Will contributors who have not received proofs and correspondents who have not received answers to their letters please accept this explanation. The delay in the publication of last month’s issue of the Journal was partly due to the patient waiting of the editor for proofs which were never returned.

**Leprosy in Hawaiian Islands.**—During the ten years 1912-21 there have been released on parole from the Kalihi Hospital, near Honolulu, and on Molokai Island, 242 lepers as being no longer “a menace to the public health.” The patients were required to report for examination, when it was found that 31 had relapsed, but 7 of these were discharged again on parole. Ten were released completely. Treatment for those who desire it is by chaulmoogra oil and its derivatives. The parole system has worked well and many lepers now go to the hospital voluntarily, thus obtaining earlier treatment and a consequent greater chance of improvement. About 70 per cent of those released on parole were segregated for less than two years.

**Diphtheria in Shansi.**—The diphtheria that took so great a toll of infant life in the months of last winter, and was never really stamped out, has again reappeared. Not only are children being carried off by it, but a good many adults as well.

**Chinese Red Cross in Japan.**—Shortly after the great earthquake in Japan, a Chinese Red Cross Relief Unit under the charge of Dr. Wayling-New consisting of five doctors, 12 male nurses, four female nurses, and three servants went to Japan, where they worked in connection with the Japanese Red Cross Society in the Red Cross Hospital, Tokyo. Their very successful work was greatly appreciated by the Japanese. The Chinese Red Cross Unit left more than $3,000 worth of the medical supplies with the Japanese Society in Tokyo, as well as a cheque for Yen 4,000. In all, the Unit spent Yen 15,000. It left when all the wounded were found to be recovering and there was no need for it to remain any longer.

**P.U.M.C.—AID TO JAPANESE SCIENTISTS.**—During the weeks since the great earthquake disaster in Japan, steps have been taken to offer the hospitality of the laboratories to a limited number of those Japanese scientists who found themselves without facilities for their work after the earthquake and fire. Dr. Carter and Dr. Leach assisted in the preliminary arrangements to extend these facilities in the name of the Rockefeller Foundation. The invitation was cordially received, and word has now come from Tokyo that the plans are proceeding favorably to bring to Peking a group of Japanese scientists.
Infectious Diseases Hospital, Shanghai.—This hospital for the Chinese was closed in October, after a very busy season in which there were more cases of summer diseases and fewer deaths than has been the case since its inception some years ago.

During the height of the cholera epidemic when a great number of cases required saline infusion, the problem presented itself of how to keep the saline at a constant required temperature. After much experiment Dr. Way Ling-New and his brother Dr. Way Sung-New invented an apparatus in which the saline solution was kept at the required heat by a self-regulating electric appliance, and this proved to be of the greatest assistance to the staff and of benefit to the patients. There was a total attendance during the year of 2,290, of whom 1,033 were in-patients and the remainder outpatients. Transfusion was given once to 333 cases, twice to 73 cases, three times to thirty cases, and four times to ten cases. As compared with 70 deaths last year, only 54 took place this year, thanks to the good work of the staff members.

Shantung Christian University.—There are now studying at this University 94 medical students and 97 pre-medical students. For the first time in its history women students have been admitted to the various Departments. Most of them are either medical or pre-medical students. In this new development the University is fortunate in having the assistance of Dr. Luella Miner, who as President of the Women's College at Peking and in other ways has laboured so long and so successfully for the cause of women's education in China. The entrance of woman students into the University has been occasioned by the transfer of the Women's Medical School from Peking to Tsinan, which will be completed by the beginning of next term, when Drs. Annie Scott, F. Heath, S. Waddell, and J. Morgan will have left Peking and taken up their work in Tsinan. The dormitories, residences and other rooms of the Women's Medical School, form a complete unit at the north-western section of the University Campus, and are now well forward in process of erection. The China Medical Board has very generously given a donation of Gold $50,000 towards the new buildings and equipment. This sum is contingent upon the Women's Board providing a total sum of Gold $115,000. Towards this amount the following gifts are already available or promised: Presbyterian Board (Sage Legacy) $35,000; Presbyterian Board (Jubilee Fund) $7,310; Union Christian College Campaign, $16,994; Union Christian College Campaign (undesignated gifts) $17,500; Methodist Board for 1924-1925, $25,000. Total, $101,804. It is hoped that further sums may be available from the balance of the Joint Women's College Drive, which will bring this total up to the figure of Gold $115,000 already specified.

Two graduates of the University return to take up posts on the staff of the Medical School, Drs. Hou Pao Chang and Han Chung Hsin, the former after a course of post-graduate study at Union Medical College, Peking, and the latter after taking the Diplomas in Public Health and Tropical Medicine subsequent upon a course of study at the University of Cambridge, England. Dr. Helena Wright and Dr. Maitland also join the staff of the Medical School in the Departments of Gynecology and Public Health respectively.

Five Scourges of Mankind.—"The five scourges I allude to are cancer, tuberculosis, rickets, venereal disease, and alcoholism. Tuberculosis and rickets account for most of the cripples we see about us; cancer, tuberculosis, venereal diseases, and alcoholism account for most of the deaths; venereal disease and alcoholism account for most of the misery and moral degradation of our race."—Childe, Environment and Health, Brit. Med. Jour., July 28, 1923.
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