THE ERADICATION OF TRACHOMA AMONG SCHOOL CHILDREN IN CHINA.*

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A comprehensive understanding of this subject requires a discussion divided as follows:

I. The extent of the problem.
   a. The character of the disease.
   b. The geographical distribution.

II. The methods and means to be employed.
   a. Remedial measures.
   b. Preventive measures.

I. THE EXTENT OF THE PROBLEM.

A. The Character of the Disease.—The etiology of trachoma is still an unsolved problem. For forty years or more the specific cause has been sought in vain by many eminent workers. On several occasions it has been enthusiastically announced that at last the causative agent had been found, but these results invariably proved to be wrong. About fifteen years ago Halberstaedter and Prohazek discovered a structure in the epithelial cells of the trachomatous conjunctiva which they regarded as the exciting cause. Subsequently it was proved that these cell inclusions were found to exist in other forms of conjunctival inflammation and, in fact, in the normal mucous membrane in certain other parts of the body. Lindner of Vienna has recently advanced a theory regarding certain "initial bodies", which he thinks are characteristic of trachoma. That they are parasitic organisms will

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yet have to be proved. It is possible that these forms of cell inclusions are a product of cell necrosis due to the disease itself or to the chemical action of the normal glandular secretion.

The behaviour of the disease warrants our conviction that its infectious character is due to a micro-organism, which will some day be isolated. The organisms are without a doubt contained in the conjunctival discharge. Infection takes place by transfer of this discharge from one eye to another, that is, by indirect contact and not by means of the atmosphere as was at one time believed. The transfer of the secretion from one eye to another generally takes place indirectly through the medium of the fingers or of toilet articles like sponges, wash cloths, towels, and handkerchiefs. It is possible, too, for it to be transferred through the handling of bed clothing, wash basins, eating utensils, door handles, chair arms, desks, etc., and in fact by contact of the hands with any articles which are in common use by those who have trachoma and by those who are not yet infected.

From our observations in Peking, and from statements made by other observers, my opinion is that the period of incubation of the disease is from three to seven days. The amount of reaction in beginning cases varies considerably, as also do the symptoms. In simple trachoma there is but very little secretion, so the chance of transfer of the infection is slight. "It seems probable that something must be added to chronic trachoma to make it actively contagious, and that in most cases this something is an intercurrent conjunctivitis which furnishes the secretion that acts to carry the contagium." We can even go further and state that any acute or chronic form of conjunctival inflammation greatly predisposes one to a trachoma infection. Therefore, various names have at times been applied to differentiate the degrees of severity of trachoma which were in all probability due to the character of the original intercurrent infection. Then, of course, a mixed infection may be superadded to an already existing trachoma. A bacteriological investigation of a large number of eye cases in the out-patient department of the Peking Union Medical College Hospital showed that over half of all the eye cases had pathologic bacteria in their conjunctival sacs and that considerably more than half of all the trachoma cases had a mixed infection of one or more types of micro-organisms, chief of which, in order of their relative frequency,
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were the Morax-Axenfeld diplobacillus, the pneumococcus, the staphylococcus and the Koch-Weeks bacillus.

It is now believed by most ophthalmologists that there is no such disease as acute trachoma, that trachoma is essentially a chronic disease which generally comes on and progresses insidiously, and that so-called acute cases of trachoma are really mixed infections. The army of 32,000 men of Napoleon I. that landed in Egypt in 1798 soon became infected with a violent ophthalmia which is often referred to as Egyptian ophthalmia or trachoma. As a matter of fact, it is firmly believed to-day that Napoleon’s army was attacked by a mixed infection of trachoma and gonorrheal ophthalmia, both of which are exceedingly common in Egypt to-day. Some authorities state that more than 90 per cent of the entire population in Egypt is so infected.

“Clinical experience compels us to admit that some predisposition and a certain immunity exists, for it often happens that members of families remain free for many years, although they live permanently with infected people on terms of great intimacy,” but Axenfeld says that “it is doubtful whether any marked racial or climatic immunity or predisposition to the disease exists,” and with this opinion the majority of ophthalmologists now agree.

Trachoma is a self-limiting disease but during the process of limitation it may make the individual blind. Trachoma is often divided in our text-books into various types or stages. The terms used may more concretely and vividly convey to us the clinical picture, but it should not be lost sight of that trachoma, allowed to continue until it reaches the self-limiting stage, represents merely a progression of a pathological process, oftentimes with complications which under the circumstances are inevitable. It does not come within the province of this paper to discuss the pathology of trachoma, but it may be worth while briefly to refer to the clinical progress of the disease.

Trachoma first affects the palpebral conjunctiva, generally the retrotarsal folds, and later involves the bulbar conjunctiva, the cornea, the tarsus, and the glands and eyelashes of the lids. Impairment of vision begins as soon as the cornea becomes involved. In some cases, especially those with loose lids which are not
habitually spastic, the cornea may not be involved for years after the conjunctiva becomes infected. Rarely, spontaneous healing of the diseased tissues takes place before the cornea is involved. Generally the disease extends to the cornea within a few months of its onset. Tiny blood vessels grow into the cornea from the conjunctiva. These vessels are referred to as pannus. Tiny infiltrations are formed underneath the corneal epithelium which may be called a superficial punctate keratitis. The pannus and keratitis continue until the whole cornea may be involved. New connective tissue fibres of the opaque variety proliferate from the blood vessels and produce permanent opacities in the cornea. In the lids the tarsus becomes thickened by accumulations of chronic inflammatory cells and distorted by the contraction of its connective tissue, new and old. This produces entropion or trichiasis. The cornea, now constantly irritated by the offending lashes, may here and there lose its epithelial covering and become infected by micro-organisms which are at this stage almost invariably present in the conjunctival sac. Ulcers of the cornea ensue, which if allowed to progress untreated, generally perforate, producing a loss of the aqueous, incarceration of the iris in the corneal wound and either partial or complete closure of the pupil, which means almost complete blindness in many cases.

The Geographical Distribution of the Disease.—There are no adequate statistics concerning the incidence of trachoma among the school children of China to warrant me in making any final deductions on that data alone. But since school children represent merely a cross-section of the general population of China it should be possible to draw certain conclusions by the use of all the data available, small and informal as it is at present. During my five years' sojourn in Canton I examined yearly the children of several schools under missionary control and found that a very consistent proportion, ranging from 8 to 11 per cent, had trachoma. Examination of general groups of the population showed about 15 to 20 per cent infected. At least 50 per cent of the eye cases that came to the clinics in Canton and Hongkong suffered from trachoma or the sequelæ of trachoma. Information gathered from West China shows that trachoma on the whole is not more prevalent (probably less prevalent) than it is in South China, while that from Central China shows a considerably larger proportion of the population infected.
In North China, with special reference to the provinces of Chihli and Shantung, our examinations have disclosed a marked increase over both the estimates for South and Central China. An examination of several hundred coolies and mechanics engaged in the construction of the buildings of the Peking Union Medical College revealed an infection among the coolies of 42.5 per cent and among the mechanics of 26.8 per cent, with an average for the two groups of 35.3 per cent. The higher percentage among the unskilled laborers is an interesting and significant finding.

One orphanage in Peking having 182 children had 66.5 per cent infected. Another orphanage of 123 children, which had for two years referred many eye cases to our clinic for treatment, still showed an incidence of 25.2 per cent. The boys and girls in The Western Hills Industrial School, established in 1921 by His Excellency Hsiung Hsi Ling, a former Premier, for the purpose of taking care of a large number of children orphaned by the famine, were examined in August 1921, when an incidence of trachoma of 68.4 per cent was found. In November, when about 1,000 children were in attendance, a complete re-examination was made and an incidence of trachoma of 86 per cent was found, showing conclusively that the uninfected cases were rapidly becoming infected. Mr. Hsiung became alarmed at our findings and immediately took measures to combat the disease to such an extent that trachoma is now practically eradicated from the school.

Two schools and almost the entire population of three villages near Paotingfu were examined by the speaker in the summer of 1921. In one school which represented the children of school age from seven adjoining villages, 47.2 per cent of the boys and 66.7 per cent of the girls, or 56.5 per cent for both, were found to have trachoma. In that village 90 per cent of the adults had trachoma, which made an average for that village, including both children and adults, of 67.5 per cent. In another village a school maintained by the Presbyterian Mission showed 68 per cent of the children with trachoma. Two more villages were visited, and in one 79 per cent and in the other 80 per cent of the people had trachoma.

A total of about 2,000 people examined, including some of those referred to above, showed an incidence of trachoma of 58.3 per cent.
In the province of Chihli about 60 per cent of all cases coming to the eye clinics have trachoma or its sequelæ. This same estimate is made for the eye clinics in Tsinan in Shantung Province.

From the results of my own observations and information received from all over the country I am convinced that trachoma is rampant over the whole length and breadth of China. It directly affects almost every family. Its victims are found in all classes of society, but mostly among the lowest class, where ignorance and uncleanness are most evident. It is probably the cause of greater economic losses in China than any other single factor. Certainly famines and floods cannot compare with it because trachoma operates every year and every day in the year over the whole of China while floods and famines, generally speaking, occur severely in comparatively small areas of China about once in a decade. With an estimate for South China of about 20 per cent, and with a gradual increase as one approaches North China, where the incidence is certainly as much as 40 per cent, an estimate for the whole of China of about 30 per cent would seem to be very conservative. It should be remembered that these estimates are only roughly made and are based upon very meagre, although fairly general data. This means that 120 million people in China have trachoma. If we apply the average and results of the disease in the most conservative way, we shall have to conclude that fully two million Chinese people are living today blind in both eyes, and five million blind in one eye, on account of trachoma alone. In addition, the vision of twenty million more has been so much reduced on account of trachoma that only with the greatest difficulty can they get around by themselves and eke out the barest kind of an existence. Fortunately most of the blindness and loss of economic vision is found among adults, the great majority of the children of school age not yet being seriously affected. In a population of 400 million people there are probably 120 million children of school age. If for them we reduce the estimated incidence of trachoma to 25 per cent, it is probable that there are thirty million children of school age this year who have trachoma. This, then, in a general way is the size of the task before us. Obviously, to eradicate trachoma from such an enormous number of children in China at the present time is absolutely impossible. With the present force of workers we can only make a demonstration, and that only on a very small scale. We have to be sure that the object of the demonstration is a worthy
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one. We have to be sure that the demonstration will succeed. But in order to carry out a successful demonstration we must have a programme which covers the problem in its entirety, for our ultimate problem is "the eradication of trachoma in China". A demonstration, then, should be looked upon as the signal gun of a campaign which should include, perhaps, first the schools and then the whole population of China. Once a beginning is made, we should not stop. Therefore, we should not begin until we are ready. We must be clear regarding the resources required and the resources available. We must be clear and we must agree concerning the methods and the means to be employed.

II. The Methods and Means to be Employed.

A. Remedial Measures.—In discussing curative measures our thoughts turn at once from the problem of the mass to the problem of the individual sufferer. In combating this disease we have the experience of the medical profession for 125 years behind us. To make a demonstration in order to try out the efficacy of one method of treatment over another is therefore quite unnecessary. Until the specific cause of trachoma is found, we shall have to continue to treat the disease symptomatically. It should be stated emphatically that the disease can be cured. In fact, hundreds of cases are probably being cured by Western-trained physicians in China each year. As to the duration of treatment one must not be dogmatic, for there is a great individual difference in response to treatment and there is a difference in the results of the treatment of trachoma in its various stages. Generally speaking, the earliest and the latest stages of trachoma are the easiest and quickest to cure, the earliest stage because the disease is confined practically to the palpebral conjunctiva, the infiltrations are still comparatively superficial and the cornea is not yet involved; the latest stage because the trachomatous elements have almost wholly been replaced by dense connective tissue—Nature's method of cure. In the latest stage, however, we may have severe corneal and lid complications to deal with, but they are the sequelae of trachoma rather than trachoma itself.

The first question that confronts the examiner is that of the differential diagnosis. Beginning trachoma closely resembles several other forms of conjunctivitis, so it is no discredit to an
ophthalmologist if he has to call a case one of suspicious trachoma. In a country where trachoma has practically been eradicated and where the cases are rare, one would scarcely be inclined to think of trachoma at all; but in China, where fully 30 per cent of the population have it (in some places as high as 80 per cent), one is fully justified in classifying a case as suspicious, particularly in a school where there is already a considerable infection and where the disease is disseminated easily. I do not intend to discuss here the differential diagnosis; but as a general guide for those who are having trouble, I might make this suggestion: Give your case of suspicious trachoma an astringent, e.g., a \( \frac{1}{2} \) per cent solution of zinc sulphate to use in the eyes three or four times a day. If after such treatment for the period of one month you cannot make a positive diagnosis of trachoma, then the case is not trachoma. When the specific organism is found we shall not have to depend upon this method.

All cases of trachoma, except those with severe corneal symptoms, especially where perforation of an ulcer is impending, should first of all have an operation. The term "expression" covers all forms of operation whether done with metal instruments or without; whether Knapp's roller forceps is used or Prince's forceps, whether gauze or a tooth brush, whether dry gauze or wet gauze. Formerly many men employed in addition a triple or quadruple bladed knife which lacerated the diseased conjunctiva and split open the follicles; the use of this knife was referred to as "scarification." But this latter procedure is being more and more condemned as unnecessarily severe and as productive of too much scar tissue, conjunctival deformities, adhesions and contractions.

The only object of an operation is to get rid of the trachomatous elements with as little trauma as possible. We should aim only to empty the follicles and as many of the papillæ as possible of their contents, which are chiefly conglomerate masses of chronic inflammatory cells—lymphocytes, plasma cells and epithelioid cells. In the gelatinous form of trachoma we aim also to remove the superficial exudate and infiltrate which gives it its name. The value of such an operation is in direct proportion to the thoroughness of the expression and in indirect proportion to the amount of trauma produced. The operator, then, is between two fires.
Sometimes he finds it wise to do the operation in more than one stage in order to reduce the amount of trauma at any one time.

I have tried during the past fourteen years all forms of operation, including scarification, and all methods of expression, including grattage and brossage. I have not used radium or X-ray, but I have given carbon dioxide snow a good trial. I have used a number of remedies and methods for after-treatment, such as applications of silver nitrate and of bluestone, rubbings with bichloride solution, swabs dipped in fine boracic acid powder; also argyrol, protargol, glycerite of tannin, boroglyceride, etc. I find it possible to succeed about equally well with any of these methods, provided they are equally thorough.

In treating trachoma cases one has to take into consideration many things, such as the economic status of the patient, the time available for treatment, the necessity for the patient's continuing his work with as little interference as possible, the pain and temporary disability factors which might keep the patient from returning, the stage of the disease, the existence of complications, etc. Most of us find it impossible to take these cases into the hospital for treatment, except perhaps the worst ones with complications, and the wealthy who do not have to work unless they are so inclined. In Peking we find that the following procedure is highly satisfactory for out-patient department cases without complications. In adults and older children cocain anesthesia of the conjunctiva is employed: with young children general anesthesia is almost always necessary. The lids are everted so that the retrotarsal folds are fully exposed. This is effected preferably without a metal everter, but one is used if eversion is insufficient or difficult to maintain. The conjunctival surface is rubbed somewhat vigorously with dry gauze. This removes most of the loose trachomatous elements and breaks open many of the follicles and papillae. This done, it is possible to see the remaining follicles which are still intact and to prick them open carefully with the point of a cataract knife, when they can easily be emptied by wiping them with gauze. All this takes care of the palpebral conjunctiva, but in most cases the bulbar conjunctiva is likewise, but to a lesser extent, involved, especially beneath the semi-lunar fold and about the caruncle. To reach the follicles in these positions one must use a forceps. We use the small circular ring Prince forceps with which
to grasp the follicles and gently express their contents. The whole conjunctival surface is wiped clean and examined carefully to see that every follicle has been removed. It is not possible to remove or express much of the contents in the papillary form of trachoma, and it is not important to do so, because these cases are amenable to after-treatment. After all the follicles have been expressed, we wipe the whole conjunctiva surface thoroughly with gauze soaked in mercuric bichloride solution (1:2000). Two or three drops of liquid petrolatum is then instilled into each eye and the lids are closed. For one half hour the patient is provided with ice compresses, which prevents a good deal of swelling and relieves much of the pain which soon comes on. The patient thereafter returns home and is told to come to the clinic the next day, when the lids are opened, after a drop or two of cocain solution has been instilled, and carefully examined for any adhesions, which, if present, are gently separated. The eyes are irrigated with boric acid solution only at that time. The patient returns daily or every other day for conjunctival rubbings with toothpick swabs dipped first into mercuric bichloride solution (1:500) and then into fine boracic acid powder. Cocain solution is instilled twice prior to each rubbing. It is not necessary to evert the lids for after-treatment, because this method effectively reaches every part of the conjunctival surface if applied correctly. A solution (¼ or ½ per cent) of zinc sulphate is given the patient to use at home three or four times daily.

In many cases we find it advisable to discontinue all active treatment for a period of a week or ten days after a month's treatment has been given in order to determine at the end of the interim just how effective the treatment has been and whether it is necessary to continue longer or not. On account of the irritation of the tissues and the continuous hyperemia maintained by the treatment, it is not possible to know what the condition of the conjunctiva really is until it has been allowed to quiet down and regenerate. If we find that the bichloride treatment is not producing the usual result, we sometimes use applications of the copper sulphate stick in adult cases.

For our in-patients the initial operation is not different from that done on the out-patients, but the after-treatment is somewhat more radical, and consequently more severe. For several days we paint
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The conjunctival surface with silver nitrate in 2 per cent solution, and after a week make gentle application daily with the copper sulphate stick.

The grattage method of operation, which in addition to wiping with gauze wet in strong bichloride solution includes brushing the conjunctival surface with a tooth brush and scraping with a dull knife, is a very effective method. But we find that it also has to be supplemented in most cases by the use of a sharp knife to open a few of the more resistant follicles and a forceps to express the follicles on the bulbar conjunctiva. I personally prefer the gauze and Prince forceps in expression, and for treatment the mercuric-boracic acid rubbings, because they are less painful, interfere less with the patient's daily duties and produce less cicatricial tissue than any other method. It is only fair to state, however, that it is not any particular form of operation or treatment that is all important. It is the thoroughness and the gentleness of the original operation and the thorough and faithful carrying out of frequent subsequent treatment that count most. So much for the individual sufferer and the treatment phase of our subject.

A physician in charge of a school should on the day of entrance examine all the children in order to determine those who have trachoma. Moreover, he should also examine all the teachers and servants connected with the school. Treatment of all trachoma cases should be begun at once and continued until they are cured. In the meantime they should be isolated from the non-trachoma pupils as far as sleeping, bathing, eating and seating arrangements are concerned. The entire school personnel should be taught to follow strictly all the precautions applicable to the disease. The non-trachoma pupils should be examined at least twice more during the school year.

From this point the subject develops into one of almost a public health nature. In fact, the whole subject is so intertwined with the great preventive medicine problem that it is quite impossible to consider it separately from it. Trachoma can never be eradicated from China or even from the schools by the curative method. In fact, I have always felt, not only for this disease but for all others, that in relative importance it pales into insignificance before the preventive method. But the curative measures cannot be dispensed with—of that, too, I feel quite convinced. To undertake
the curative part of the work there are probably in the whole of China not more than fifty physicians who are adequately trained and who have the time. There is need of a great increase in the number of physicians who can do this work before any substantial progress can be expected or even before a demonstration which includes a follow-up programme should be attempted. A post-graduate hospital and school of ophthalmology is necessary in China, where large numbers of physicians, chiefly Chinese of course, could go for special training. It is our hope that before long we shall have such an institution in Peking.

B. Preventive Measures.—We now come to the most important phase of our subject. Most important, because without it we can hope only to accomplish but a tiny bit of the job, and that, too, only temporarily. Most important, because it deals with the problem of the mass, while remedial efforts deal with the problem of the individual. The programme of the former is wholesale, while that of the latter is retail. We all know about preventive medicine; we all believe to a certain degree in public health movements, but evidently we are not thoroughly convinced. If one were to analyze the activities of the hundreds of foreign physicians in China, would he not be forced to conclude that about 99 per cent of the effort was being put into curative measures and about 1 per cent into preventive measures? The time has come when we should stop fooling ourselves about what we think public health and personal hygiene will do for China. If we really believed in it, as we say we do, there would not be 400 mission hospitals and nearly 1,000 medical missionaries in China to man these hospitals and only five or six experts giving their time to public health work; there would not be, on the one hand, ten medical schools, with others of doubtful grade seeking to be established, and on the other hand, no school of hygiene; there would not be a total budget of $36,000 Mex. for public health effort for the whole of China when the annual budget of several mission hospitals is each as much as $50,000.

Or perhaps if we were strictly honest, we would have to confess something like this: That our medical school curriculum paid such slight attention to preventive medicine and so much to curative medicine that when we were finally turned out as full-fledged physicians into a suffering world we at once turned our attention to those things which we were best trained to do. That we were so
imbued with the idea of giving immediate relief to the individual patient that we failed to see much if any beyond the present need. That we soon became so overwhelmed with duties entailed in taking care of the sick that it became easy for us to make the excuse that we were too busy to give any of our time for preventive effort. Yes, we are trying to lift the load with the short end of the lever, and that, too, very close to the fulcrum. We toil, we sweat, we do our job well, and we are more or less complacent. And the result? We are touching, as Dr. Balme has pointed out, by our curative efforts only a fraction of one per cent of all the sick in China. Of the 120 million cases of trachoma it is unlikely that more that 10,000, as the most extreme estimate, were cured during the past year, and among the 30 million cases among school children probably not more than 1,000 were cured. The results are almost negligible from the numerical point of view. No, it cannot be done that way, and it will not be done much better in our day unless we face the facts and act upon all the knowledge in our possession.

I take it for granted that we are all vitally interested in the eradication of trachoma, and of every other disease for that matter. Also that we might be willing to a certain degree to make personal sacrifices, to give up some cherished ambitions, in order to bring that about. If an unprejudiced jury of laymen were considering the facts in the case, I believe they would vote that as much effort and means be devoted to preventive medicine in China as is given to curative medicine. But that is too much, we physicians say. Are we willing to vote that half as much effort be given to preventive measures? No. I do not believe we are interested that much. Nor do I believe we physicians are interested in seeing one-fourth of the effort being given to that phase of work. But I can not imagine that any physician would consider himself up-to-date or be honest with himself if he did not thoroughly believe that at least one-tenth as much effort and money should be put into public health work as we are putting into the healing of the sick in China. If I am right, then for our ten medical schools we would have one splendid school of hygiene in China; our hospitals would designate one-tenth of their budget to public health activities; and the mission boards and other boards and organizations participating in medical work would set apart one-tenth of their medical resources for this
same purpose. It would be a reviving of the "tithe," a practice which in most quarters has long since been forgotten. "One-tenth for public health" would be the motto hanging on our walls, the remainder on our desks and the headline on our budget sheet.

The most fundamental need in China to my mind is a great school of hygiene, fully manned, which, for the time being at least, would be the dynamic centre from which all our activities along lines of public Health and hygiene should radiate. The faithful little group of men and women now engaged in this work are giving almost superhuman effort. But we are expecting them "to make bricks without straw", "to make bread without dough". It's the dough they need.

The object of a school of hygiene should be two-fold: first, to train personnel; second, to propagate health education.

The school of hygiene should be prepared, of course, to train physicians to be experts in public health. For them the course would be one, two or three years. These men would become the leaders of public health activities in the provinces and in the cities. The school should also provide short courses and summer courses for physicians and nurses. From this group I believe there are many who each year would welcome the opportunity to learn what they could do and how they could help to further public health activities. Furthermore, the school would be missing a great opportunity if it did not offer normal courses in health education to laymen-teachers, college and normal school students, officials, in fact to any seriously minded individual having the proper preparation, no matter what his profession. The school should also provide extension courses in health education at different centres in China, most likely in the summer time. This whole group would gather statistics, keep in touch with favourable public sentiment appearing in any part of the country, and give their assistance whenever possible in preventing or combating epidemics which have already appeared in any part of the country.

The school would directly propagate health education through propagandists who would disseminate, through the translation of magazines and monographs, through the preparation of articles for the public press, through the assembling and the setting up of exhibits and in many other ways disseminate a popular knowledge
of health education. Dr. J. B. Grant of Peking said the other day that health education is more important than health legislation. He might even have gone farther and said that health legislation depends absolutely upon the success of health education. In China certainly we are not going to witness the governmental officials going ahead of public opinion and public demand in this matter. But, we might as well realize at the beginning, success cannot be accomplished without the aid of health legislation.

A school of hygiene should exist to set the standard and keep methods strictly up-to-date. Normal courses in health education could easily be grafted into the seven schools in China which are doing physical education, as Mr. McCloy of South-Eastern University at Nanking has pointed out. Normal courses could be provided, or at least normal teachers in this subject could be included, in the staff of a large number of government and mission schools. There is no necessity for developing the idea further. You are all more familiar with an ideal program that I am. But with some such program, I believe, even the near future would offer something bright in the way of eradication of disease, and, to refer back to my subject, the "eradication of trachoma among the school children of China."

Earlier in my paper I referred to the value of a demonstration in the eradication of trachoma. To carry out a demonstration simply to make a local impression or to satisfy local demands without a definite follow-up program is absurd. To make a demonstration, or several demonstrations, among groups that can be controlled, for propaganda purposes and for the object of training workers as a definite part of a general or even a specific public health movement, would be highly commendable. I do not decry the efforts that are being put forth by any physician to eradicate trachoma from any school or group of schools over which he has charge, for in this disease the curing of every afflicted person is in itself distinctly a preventive result. But this single-handed effort has only a slight appeal to me compared to what might be accomplished by combined effort. The success of any public health enterprise, of which trachoma eradication is only an example, is so dependent, this thing upon that, one thing upon another, and so on, that it reminds me of "the house that Jack built". I should like to take this opportunity to say to you who
are interested in public health work that you are assured of the help of the ophthalmologists in China. Finally, let us adopt as our watchword, "One-tenth for public health".

REFERENCES.

A PRELIMINARY SURVEY OF SCHISTOSOMIASIS INFECTION IN THE REGION OF CHANGTEH.

George T. Tootell, m.d., Changteh, Hunan.

The original article by Dr. O. T. Logan, of Changteh, dealing with schistosomiasis was written in 1906, and his deductions in that article as to the intermediate host have been borne out by later investigators. Our laboratory records for the past seven years have shown from 1 per cent to 2 per cent of all specimens of stools examined to contain the ova of Schistosoma japonicum, usually accompanied by the ova of one or more of other intestinal parasites.

The patients with schistosomiasis usually come from districts from 50 to 100 li (17-33 miles) distant from Changteh. This year an opportunity presented itself for us to visit these districts, so one of the hospital staff, accompanied by a microscopist, made the trip. Most of the cases were found in or around two centres; the local people said that only a few cases were to be found in near-by villages. The disease is known to the Chinese as the Pi K’uai Ping, (脾壆病) or Huang Chung Ping (黃勝病) and is recognized by them from the symptoms of bloody stools, weakness, swelling of the
legs and enlargement of the abdomen, starting on the left side under the costal arch. They do not distinguish this disease from ankylostoma.

This trip comprised a visit to the town of "A," where ten cases had been reported, but none had presented themselves for examination. At "B," the next stopping place, only two cases were known to the people, and here, too, the cases were not brought in for examination. The town "C" was reached the second day. Several patients with this disease seen in our hospital had come from this place and we expected to do most of our investigation here. In order to note whether there were any cases among the people living in the hilly districts, a village "D," about 1,000 feet higher than "C," was visited. No ponds were seen around "D," and no cases were reported by the people living there. During the trip only Chinese whom we knew, i.e. employees of missions working in the district, or those who were sympathetic with the object of our trip, were questioned. Later a visit was made to "E," a village 20 li beyond "C," and on the bank of a small stream. Only in "C" and "E," however, were cases seen. The following tables are the results obtained from these two places. The village population in this region numbers from 2,000 to 4,000 people, with a thickly-settled farming district surrounding each village.

These people, during the hot and moderately hot weather, use unboiled water from the ponds for drinking purposes, and throughout the year wash their clothes in the same ponds. Snails, clams and frogs are found in all the ponds and are used for food by many of the people. Most of the patients were farmers, the rest being small shopkeepers and housewives.

The tables enable one to form an estimate of the prevalence of schistosomiasis in the two towns, especially when it is remembered that they are the results of the first examination of feces from all, whether well or sick, who could be persuaded to bring in specimens. The ages of the infected ranged from ten to fifty years.

Acknowledgement is made of the assistance given by members of the Alliance Mission who made the investigating party comfortable in their chapels and aided in many ways in making the trip a success.
Table 1. Schistosomiasis in two towns in Hunan.

<table>
<thead>
<tr>
<th>Town</th>
<th>“C”</th>
<th>“E”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number examined</td>
<td>55</td>
<td>8</td>
</tr>
<tr>
<td>No. males examined</td>
<td>52</td>
<td>7</td>
</tr>
<tr>
<td>No. females examined</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Cases negative</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td>Cases positive</td>
<td>34</td>
<td>4</td>
</tr>
<tr>
<td>Males infected</td>
<td>31</td>
<td>3</td>
</tr>
<tr>
<td>Females infected</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Percentage of cases negative</td>
<td>38%</td>
<td>50%</td>
</tr>
<tr>
<td>Percentage of cases positive</td>
<td>62%</td>
<td>50%</td>
</tr>
<tr>
<td>Percentage of males examined</td>
<td>95%</td>
<td>87.5%</td>
</tr>
<tr>
<td>Percentage of females examined</td>
<td>5%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

Table 2. Symptoms of Persons Infected.

| No symptoms | 12 |
| Weakness    | 26 |
| Swollen feet| 7 |
| Enlarged abdomen | 17 |
| Bloody stools | 13 |

Table 3. Hemoglobin Percentage in Persons Infected.

<table>
<thead>
<tr>
<th>No. Infected</th>
<th>Percentage of hemoglobin.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40%</td>
</tr>
<tr>
<td>3</td>
<td>50%</td>
</tr>
<tr>
<td>6</td>
<td>55%</td>
</tr>
<tr>
<td>14</td>
<td>60%</td>
</tr>
<tr>
<td>2</td>
<td>65%</td>
</tr>
<tr>
<td>9</td>
<td>70%</td>
</tr>
<tr>
<td>2</td>
<td>75%</td>
</tr>
<tr>
<td>1</td>
<td>80%</td>
</tr>
</tbody>
</table>

| 38            | Average percentage 62%   |
Table 4. Other Intestinal Parasites Found in Persons Infected.

Male patients:

- Schist, jap.; Ascar. lumbric. ... ... 12
- Schist, jap.; Ankylost. duod. ... ... 4
- Schist, jap.; Ent. histolyt. ... ... 7
- Schist, jap.; Ascar. lumbric.; Ent. histolyt. ... 4
- Schist, jap.; Ascar. lumbric.; Ankylost. duod. ... 5
- Schist, jap.; Ent. histolyt.; Trichon. iu. test. ... 1
- Schist, jap.; Ent. histolyt.; Ascar. lumbric.; Ankylost. duod. ... 1

Female patients:

- Schist, jap.; Ascar. lumbric.; Ent. histolyt. ... 1
- Schist, jap.; Ascar. lumbric.; Ankylost. duod. ... 3

Table 5. Eosinophilia Percentage in Those Infected.

<table>
<thead>
<tr>
<th>Males</th>
<th>Eosinophilia %</th>
<th>Females</th>
<th>Eosinophilia %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6%</td>
<td>I</td>
<td>6%</td>
</tr>
<tr>
<td>1</td>
<td>7%</td>
<td>1</td>
<td>8%</td>
</tr>
<tr>
<td>4</td>
<td>8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>9%</td>
<td>1</td>
<td>11%</td>
</tr>
<tr>
<td>1</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>11%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>13%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>16%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>17%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>18%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>19%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>21%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>22%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>13%</td>
<td>4</td>
<td>14%</td>
</tr>
<tr>
<td>30%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average %: 13%
The results of this first survey show the following points:

1. The prevalence of infection is more extensive in "C" and "E" than we had previously supposed.
2. The hilly districts, where there are no ponds, are apparently free from this infection.
3. Many people are harbouring the infection without showing any of the usual clinical symptoms, and are therefore "Schistosomiasis carriers".

"SCHISTOSOMA JAPONICUM INFECTION IN AN AMERICAN CHILD".
(Termination of Case first reported by Dr. Logan in 1911).

HENRY EDMUND Meleney, M.D., PeKiNG.

Since cases of schistosomiasis are rarely followed from their beginning to a fatal termination I have thought it worth while to report briefly the subsequent history of the case first reported by Logan under the above title and later included in the study of Bovaird and Cecil. The case is noteworthy in that the patient was the first one in whom urticarial fever was connected etiologically with schistosomiasis japonica.

Briefly to summarize the case: the patient, C. H., when a boy, in the spring of 1908 waded and swam in ponds and lakes about Yochow, Hunan Province, and in July of that year was attacked by typical urticarial fever, followed by bloody diarrhoea. Ignorant of the cause of his disease, he continued for over two years to swim and wade in water about Yochow, and had frequent attacks of fever associated with abdominal pain and dysentery. In July, 1910, Logan found eggs of Schistosoma japonicum in the patient's feces.

At this time he was seen in consultation by Dr. H. S. Houghton, who, because of the patient's history, suggested the connection of urticarial fever with schistosomiasis and confirmed the connection a few days later on other cases in conjunction with Dr. Lambert at Kiukiang. From that time on the patient did not
expose himself to infected water. He returned to America that year (1910), and improved in general health, but continued to have attacks of diarrhoea at intervals of four to six weeks, with blood and mucus in the feces. These attacks were still recurring when the patient was seen by Bovaird and Cecil in 1912. After that he spent most of his time studying in America and improved somewhat in health as he grew older. He was never able, however, to put his full energy into studying. During the Great War the patient was in the United States navy. In 1919 he was sent by the Smithsonian Institution of Washington to Australia to collect zoological specimens, and was able to perform the physical exertion necessary in that work. In 1922 he returned to China in the same work.

In September, 1923, while at Kuling, where his disease was first diagnosed, he was attacked by abdominal pain localized to the right lower quadrant. This continued for three days before he called a physician, because he had had many similar attacks and had been told they were the result of schistosomiasis. Temperature was 100°F. to 103°F. A blood smear showed 92 per cent polymorphonuclear leucocytes, but no eosinophiles. Laparotomy was performed at once. The following is the surgeon's (Dr. C. E. Buswell's) description of the pathological condition found:

"A McBurney incision was made, and after the peritoneal cavity was opened there was found such a mass of adhesions that we had to dissect our way carefully for some time before we could bring the large intestine into the field of operation, and even then we were unable to find the appendix. The McBurney incision was therefore closed and a right rectus incision made after which the appendix was finally found just over the brim of the pelvis, and bound down with firm adhesions. The appendix was entirely gangrenous, and contained a fecolith about the size of a large pea and almost perfectly round. The adhesions were worse in the region of the appendix, but old adhesions were also found throughout the entire abdominal cavity. There existed also numerous spots, or patches both on parietal and visceral peritoneum, about the size of a dime or smaller. They were granular in appearance and had the feeling as though they were made of small calcified granules."

After operation the patient gained very slowly. On the nineteenth day, however, a hemorrhage occurred from deep in the wound, and there was dark blood in the bowel movements. The next day another profuse hemorrhage occurred and he died on the twenty-first day after operation. Unfortunately, a necropsy was not performed.
COMMENT.

If is evident that the profound changes in the abdominal viscera produced by schistosomiasis complicated seriously the symptoms and operative possibilities in the attack of acute appendicitis which terminated the case. Undoubtedly the infection in this patient was much heavier than is usually seen in foreigners in China. It was severe enough to prevent his developing to his full physical and mental capacity. Nevertheless, there is no evidence that the disease would ever have progressed to a fatal termination in the absence of some such complication as that which occurred.

I am indebted to Dr. C. E. Buswell for furnishing me information concerning the termination of this case.

REFERENCES.


TARTAR EMETIC IN SCHISTOSOMIASIS JAPONICA.*

George T. Tootell, M. D., Changteh, Hunan.

For years past we have obtained good results in the treatment of Schistosomiasis japonica from the use of preparations containing iron, arsenic or strychnine, but only since using tartar emetic intravenously have we been able to promise patients that if they would remain in the hospital for two months we could effect a cure. It has taken quite a little tact and diplomacy, including in some cases the promise of free food, to induce them to remain. We have insisted upon the treatment being given in the hospital, and the following tables have been compiled from our hospital charts.

In giving the intravenous treatment tartar emetic has been used in 1 per cent and 2 per cent solutions. Last year the initial dose was 0.5 c.c. of 1 per cent solution, increased from time to time in the manner indicated below. However, a little experience convinced us that we could safely use the 2 per cent solution by commencing with an initial dose of 0.5 c.c., increasing the amount day by day by 0.5 c.c. until on the tenth day the dose was 5 c.c.

*Read at the C.M.M.A. Conference, Shanghai, February, 1923.
<table>
<thead>
<tr>
<th>No.</th>
<th>Age</th>
<th>Sex</th>
<th>Occupation</th>
<th>Complications</th>
<th>Spleen</th>
<th>Character of stool</th>
<th>Result of Complications</th>
<th>Eosinophils</th>
<th>Hemo-globin</th>
<th>No. of days in hospital</th>
<th>No. of injections</th>
<th>Result of treatment</th>
<th>After 1 mo.</th>
<th>After 3 mo.</th>
<th>After 6 mo.</th>
<th>After 1 yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>Male</td>
<td>Student</td>
<td>Diarrhoea; epistaxis</td>
<td>5&quot; below costal margin</td>
<td>Soft, yellow</td>
<td>Cured</td>
<td>20%</td>
<td>70%</td>
<td>33</td>
<td>12</td>
<td>Improved</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>Male</td>
<td>Farmer</td>
<td>Ankylostoma</td>
<td>3&quot; below</td>
<td>Bloody</td>
<td>Cured</td>
<td>10%</td>
<td>40%</td>
<td>30</td>
<td>10</td>
<td>Improved</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>Male</td>
<td>Farmer</td>
<td>Infection of ankle; ascites; ankylostoma</td>
<td>3&quot; below</td>
<td>Bloody</td>
<td>Cured</td>
<td>10%</td>
<td>40%</td>
<td>29</td>
<td>14</td>
<td>Improved</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
</tr>
<tr>
<td>4</td>
<td>27</td>
<td>Male</td>
<td>Coolie</td>
<td>Fistula; ankylostoma; ascites</td>
<td>Not enlarged</td>
<td>Soft, yellow</td>
<td>Not Improved</td>
<td>10%</td>
<td>80%</td>
<td>28</td>
<td>0</td>
<td>Not improved</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td>Male</td>
<td>Farmer</td>
<td>Jaundice</td>
<td>1&quot; below costal margin</td>
<td>Bloody</td>
<td>Cured</td>
<td>10%</td>
<td>80%</td>
<td>13</td>
<td>5</td>
<td>Not improved</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
<td>No report</td>
</tr>
<tr>
<td>6</td>
<td>54</td>
<td>Male</td>
<td>Merchant</td>
<td>Ascites</td>
<td>1&quot; below</td>
<td>Bloody</td>
<td>Cured</td>
<td>10%</td>
<td>80%</td>
<td>13</td>
<td>5</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>7</td>
<td>24</td>
<td>Male</td>
<td>Farmer</td>
<td>E. histolytica; ascites; ankylostoma</td>
<td>1&quot; below</td>
<td>Soft, yellow</td>
<td>Cured</td>
<td>20%</td>
<td>80%</td>
<td>39</td>
<td>15</td>
<td>Not improved</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>8</td>
<td>20</td>
<td>Male</td>
<td>Merchant</td>
<td>E. histolytica</td>
<td>1&quot; below</td>
<td>Soft, yellow</td>
<td>Cured</td>
<td>25%</td>
<td>80%</td>
<td>33</td>
<td>19</td>
<td>Improved</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>9</td>
<td>21</td>
<td>Male</td>
<td>Clerk</td>
<td>E. histolytica</td>
<td>2&quot; below</td>
<td>Bloody</td>
<td>Cured</td>
<td>12%</td>
<td>70%</td>
<td>68</td>
<td>5</td>
<td>Improved</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>10</td>
<td>16</td>
<td>Male</td>
<td>Country boy</td>
<td>Ascites</td>
<td>3&quot; below</td>
<td>Bloody</td>
<td>Cured</td>
<td>10%</td>
<td>80%</td>
<td>23</td>
<td>5</td>
<td>Improved</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>11</td>
<td>15</td>
<td>Male</td>
<td>Country boy</td>
<td>Ascites; ankylostoma</td>
<td>2&quot; below</td>
<td>Bloody</td>
<td>Cured</td>
<td>20%</td>
<td>70%</td>
<td>51</td>
<td>14</td>
<td>Improved</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>12</td>
<td>23</td>
<td>Female</td>
<td>Farmeress</td>
<td>Amenorrhea; ankylostoma; ascites</td>
<td>2&quot; below</td>
<td>Hard, yellow</td>
<td>Cured</td>
<td>10%</td>
<td>70%</td>
<td>54</td>
<td>16</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>13</td>
<td>20</td>
<td>Male</td>
<td>Farmer</td>
<td>E. histolytica; ankylostoma; malaria</td>
<td>Not enlarged</td>
<td>Soft</td>
<td>Not Improved</td>
<td>20%</td>
<td>70%</td>
<td>27</td>
<td>None</td>
<td>Not treated</td>
<td></td>
<td></td>
<td></td>
<td>Infected</td>
</tr>
<tr>
<td>14</td>
<td>17</td>
<td>Male</td>
<td>Farmer</td>
<td>Vesical calculus</td>
<td>2&quot; below costal margin</td>
<td>Soft</td>
<td>Cured</td>
<td>15%</td>
<td>60%</td>
<td>99</td>
<td>30</td>
<td>(Died from typhoid fever; schistosomiasis previously cured)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>Male</td>
<td>Farmer</td>
<td>Typhoid fever</td>
<td>2&quot; below</td>
<td>Hard</td>
<td>Died</td>
<td>10%</td>
<td>60%</td>
<td>54</td>
<td>8</td>
<td>Improved</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>16</td>
<td>15</td>
<td>Male</td>
<td>Farmer</td>
<td>E. histolytica; ankylostoma; malaria</td>
<td>2&quot; below</td>
<td>Soft</td>
<td>Cured</td>
<td>12%</td>
<td>70%</td>
<td>31</td>
<td>1</td>
<td>Not improved</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>17</td>
<td>15</td>
<td>Male</td>
<td>Farmer</td>
<td>E. histolytica; ankylostoma; malaria</td>
<td>2&quot; below</td>
<td>Bloody</td>
<td>Cured</td>
<td>10%</td>
<td>80%</td>
<td>23</td>
<td>5</td>
<td>Improved</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>18</td>
<td>15</td>
<td>Male</td>
<td>Farmer</td>
<td>E. histolytica; ankylostoma; malaria</td>
<td>2&quot; below</td>
<td>Bloody</td>
<td>Cured</td>
<td>10%</td>
<td>80%</td>
<td>23</td>
<td>5</td>
<td>Improved</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>19</td>
<td>10</td>
<td>Male</td>
<td>Student</td>
<td>Mucus</td>
<td>1&quot; below</td>
<td>Mucus</td>
<td>Cured</td>
<td>19%</td>
<td>60%</td>
<td>20</td>
<td>10</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Improved</td>
</tr>
<tr>
<td>20</td>
<td>19</td>
<td>Male</td>
<td>Farmer</td>
<td>E. histolytica; ankylostoma</td>
<td>6&quot; below and hard</td>
<td>Soft, yellow</td>
<td>Cured</td>
<td>10%</td>
<td>40%</td>
<td>30</td>
<td>10</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>21</td>
<td>48</td>
<td>Male</td>
<td>Farmer</td>
<td>Not enlarged</td>
<td>3&quot; below</td>
<td>Soft, yellow</td>
<td>Cured</td>
<td>9%</td>
<td>70%</td>
<td>34</td>
<td>15</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>22</td>
<td>16</td>
<td>Male</td>
<td>Student</td>
<td>E. histolytica; ankylostoma</td>
<td>3&quot; below c.m. and hard</td>
<td>Mucus</td>
<td>Cured</td>
<td>11%</td>
<td>65%</td>
<td>31</td>
<td>12</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>23</td>
<td>12</td>
<td>Male</td>
<td>Student</td>
<td>Not enlarged</td>
<td>3&quot; below</td>
<td>Soft, yellow</td>
<td>Cured</td>
<td>18%</td>
<td>60%</td>
<td>31</td>
<td>13</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>24</td>
<td>12</td>
<td>Male</td>
<td>Student</td>
<td>E. histolytica; ankylostoma</td>
<td>4&quot; below</td>
<td>Soft, yellow</td>
<td>Cured</td>
<td>14%</td>
<td>50%</td>
<td>43</td>
<td>15</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>25</td>
<td>20</td>
<td>Male</td>
<td>Farmer</td>
<td>Not enlarged</td>
<td>4&quot; below</td>
<td>Soft, yellow</td>
<td>Cured</td>
<td>17%</td>
<td>70%</td>
<td>24</td>
<td>12</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
<tr>
<td>26</td>
<td>24</td>
<td>Female</td>
<td>Housewife</td>
<td>Malaria; ankylostoma</td>
<td>1&quot; below</td>
<td>Hard, brown</td>
<td>Cured</td>
<td>30%</td>
<td>80%</td>
<td>24</td>
<td>8</td>
<td>Cured</td>
<td></td>
<td></td>
<td></td>
<td>Cured</td>
</tr>
</tbody>
</table>

*The infection which occurred after one year in Case No. 12 may have been due to a reinfection.
We have been guided by the symptoms of the patient after injection as to the amount to be given the next time. Headache, nausea, coughing or diarrhoea indicate that the dose is too strong, and when any of these symptoms occur we reduce the amount of the next dose by one half to one c.c. When the dose is tolerated by the patient, larger amounts can be given. We have never dared to give over 5 c.c. of the 2 per cent solution at any time. The first injections, as a rule, are an index as to whether the patient will remain in hospital for further treatment. One drop of the solution injected into the surrounding tissue instead of into the vein will cause pain for hours which in some cases it requires morphin to relieve. A vein of the arm (median basilic) was the one most commonly used. When the case was complicated by the presence of other intestinal parasites, treatment for the latter was instituted before commencing the intravenous injections. Our out-patient records show that 80 cases were seen in the clinic during the year. One day, five men, all infected with schistosomiasis, were examined; but none would consent to stay in the hospital.

In Table 1 details are given of all the cases treated.

No patient was considered cured unless the specimen stools were negative for five consecutive days, and in some cases, where the infection had been heavy, it was required that the stools should be negative for a week.

<table>
<thead>
<tr>
<th>Table 2. Summary of Cases Treated.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RESULT</strong></td>
</tr>
<tr>
<td>Cured</td>
</tr>
<tr>
<td>Improved</td>
</tr>
<tr>
<td>No improvement</td>
</tr>
<tr>
<td>Died</td>
</tr>
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<td></td>
</tr>
</tbody>
</table>

**Patients cured.**—Fifty per cent of all those receiving treatment were cured. The average number of days in hospital while taking treatment was thirty-eight. The average number of injections necessary to effect a "cure" was seventeen.

**Patients improved.**—Twenty-nine per cent of all cases receiving treatment were improved but not cured, as for various reasons they
were unwilling to remain in hospital long enough for complete treatment. The stools during the last week in hospital showed ova of *S. japonicum*.

*Cases showing no improvement.*—These patients were unwilling to remain in the hospital for treatment sufficient to cure them.

*Death of patient.*—One patient died from a complication.

The results of treatment by the use of tartar emetic intravenously have been uniformly good when the patients have stayed in the hospital until pronounced cured, and when complications have been avoided.

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**A NEW TYPE OF AMOEBA PARASITIC IN MAN, OBSERVED IN NORTH CHINA***

**Ernest Carroll Faust M.D., Peking.**

So much has been written of late years on human entamoebae, while so little of this great body of data has been found authentic, that one weighs his information for some time before consenting to place it on record. Particularly is this true with regard to creating new species of amoebae pathogenic in man. Dobell (1919) has done an admirable piece of work in showing that the only proved human pathogenic amoeba is *Entamoeba dysenteriae* (or, as he prefers to term it, *E. histolytica*). Yet the form that has come under my observation on four different occasions† this year has proved of such decided interest and uniqueness that I desire to communicate my information to others, believing that they, too, may have occasion to observe it.

**Case Histories.**

**Case i.**—A Chinese farmer of Chihli Province, aged 44, was admitted to the Peking Union Medical College Hospital on September 19, 1922, with an acute attack of dysentery which he said had lasted for ten days, but gave no previous history of any such infection. On microscopic examination of the

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*Contribution from the Parasitology Laboratory, Department of Pathology, Peking Union Medical College. Read in the Section on Parasitology, C.M.M.A. Conference, Shanghai, February 16, 1923. Reprinted from *Journal of Parasitology*, June, 1923.*

†A colleague in private practice in Peking has recently observed this same parasite from examination of one of his cases.
stool large numbers of red and white blood cells were observed and among them many entamoebae, not E. dysenteriae, with red blood cell inclusions. A diagnosis of amoebic dysentery was made and the patient placed on emetine treatment, in the form of emetine bismuth iodide, 0.2 gram per diem for twelve consecutive days. Beginning with the fourth day following the first administration of the emetine the stools were negative for amoebae or amoebic cysts and continued negative through a daily routine examination of all stools passed for the next ten days, at the end of which time the patient was dismissed as cured.

Case 2.—A European, thirty-eight years of age, third-class patient, for a number of years resident in China and in straightened circumstances, was admitted to the Peking Union Medical College Hospital on December 14, 1922, with an acute attack of dysentery. He had first noticed the symptoms three months previous, during which time there had been intermittent blood and mucus in the stools and pain at time of defecation. Only on the fourth day following admission did microscopic examination of the stools reveal large numbers of entamoebae, not Entamoeba dysenteriae, with red blood cell inclusions. A diagnosis of amoebic dysentery was made and the patient was placed on emetine treatment. Emetine bismuth iodide pills (0.2 gram) were first prescribed but were passed unchanged in the stool, following which 0.06 gram of emetine hydrochloride was administered intravenously. On the eighth day following admission the microscopic examinations were negative and continued so until the end of the examination some ten days later.

Case 3.—A Chinese, aged 28, occupation unknown, of Chihli Province, was admitted to the Peking Union Medical College Hospital on October 2, 1922, with a chronic dysentery. He gave a history of dysentery five years previous to admittance, and had suffered intermittently from digestive troubles since that time.

The stool when submitted to the clinical laboratory proved positive for dysentery bacilli of the Flexner type, and on the fifth day following admission revealed, on microscopic examination, specimens of Entamoeba dysenteriae, E. coli, numerous flagellates, and also the new entamoeba to be described later in this paper. The patient was placed on a treatment of emetine bismuth iodide (0.2 gram per diem) for a course of twelve routine treatments. On the tenth day after admission the stools were negative for protozoa, while numerous examinations for two months following failed to show any of the new type of amoeba, although the stools were positive for E. dysenteriae cysts.

Case 4.—A Chinese policeman, aged 42, from Peking, West City, was admitted to the Peking Union Medical College Hospital on October 4, 1922, suffering with acute dysentery. Three years previous to admission he admitted having had dysentery, although his present symptoms had first been noticed three months ago.

Microscopic examination of the stools revealed swarms of Entamoeba dysenteriae, and among them small numbers of the new species. The
patient was placed on a treatment of emetine bismuth iodide (0.2 gram per
diem) for twelve treatments. On the fifth day following admission the stools
were negative for the new form, and on the sixth and succeeding days they
revealed no *E. dysenteriae*. However, the patient died of cardiac failure on
the eighth day.

**Description of the Amoeba.**

The amoeba common to all these examinations in the inactive
state (Fig. 1) was at first confused with *Entamoeba coli*, although
it was measurably smaller than that species. When not quiescent,
it measured from 16 to 17 microns in diameter, but was longer and
more attenuate in the motile state. In Cases 2 and 4, where *E. coli*
was also present, an opportunity for comparison with it was afforded,
while in Cases 3 and 4, where *E. dysenteriae* was the major amoebic
infection, comparison between the new form and the common
dysentery amoeba was made possible.

The ectoplasm of the new form was clear and limpid and
seemed to be confined to occasional pseudopodia. The endoplasm
was thick and viscous. Like *Entamoeba dysenteriae* the Chinese
species contained red blood cells (Figs. 21, 22). In Cases 1 and 2
it was the only known responsible agent for the dysenteric condi-
tion. Like *E. coli*, but unlike all authentic descriptions of *E.
dysenteriae*, it contained at times bacteria within food vacuoles.
Unlike both of these or any other described entozoic amoeba it had
a definite, fixed polarity, so that there was a definite anterior end,
broadly lobose in characteristically active specimens (Fig. 2); it
had also a definite posterior end, away from which the organism
always tended to flow. Careful examination of this posterior end
showed it to be attenuate, with one definite median posterior pro-
toplasmic caudostyle, surrounding which were apparently found at
times several smaller protoplasmic projections. The caudostyle
was observed without difficulty in living specimens (Fig. 3) and
could be identified in stained specimens fixed in Schaudinn's fluid
(Figs. 4, 23, 24). Just anterior to it the cytoplasm was at times in
fixed specimens highly vacuolate. A characteristic of this species
was the entanglement of the posterior end in a mass of fecal débris,
so that individuals in active motion frequently presented the effect
of a viscous object dragging a mass of straw along behind it. The
caudostyle and the accompanying protoplasmic projections were
undoubtedly responsible for this débris entanglement. They not
only increased the load of the organism, but contributed, no doubt, to the elongated shape of the amoeba during rapid movement.

In order to study the movement of the organism with respect to its anteroposterior polarity, a specimen freed of débris and without red corpuscle inclusions was placed on a warm stage and observed for a period of 160 seconds, during which time free-hand sketches of its movement and shape were made (Figs. 5-20). An examination of the sketches demonstrates five points: (1) The movement is always away from the caudostyle; (2) the caudostyle is definitely attenuated (i.e., a definite anatomical structure) even when it is not enmeshed in débris and the body consequently elongated; (3) the anterior end is characteristically broadly lobose; (4) the nucleus always lies in the anterior portion of the organism; and (5) pseudopodia, which consist solely of ectoplasm, occur but seldom. In case the tactic stimulus of the animalcule proceeds from the posterior end, as apparently is the case at times, the amoeba then turns on the caudostyle as a pivot, either twisting around it, as in Figure 3, or turning over it in a plane which is vertical to the observer.

The nucleus is a spherical body in the anterior part of the amoeba. It measures 3 to 4.5 microns in section, and is provided with minute stipplings of chromatin on the inner side of the nuclear membrane, which, in stained fixed specimens, are seen to be connected with achromatic fibrils. The karyosome likewise differs materially from that of *Entamoeba dysenteriae* or *E. coli*. It consists of a star-shaped clump of chromatin, with a hollow centre, in the centre of the nucleus, with radiating lines of chromatic granules. The nuclear structures are, therefore, specifically different from those of either *E. coli* or *E. dysenteriae*.

*In vitro* the amoeba does not survive 40° C., even precystic organisms succumbing at this temperature. Since the temperature of the rectum at times exceeds this degree in amoebic dysentery, it seems probable that under such conditions this amoeba must succumb. While it seems altogether probable that the organism follows the course of all related forms in possessing a cystic stage, in many examinations made, incident to the study of this species, no cysts were found. Division of the organism has not been observed.

Preservation of cover-glass films with Schaudinn's fluid is extremely difficult. Specimens from three of these cases were in
most instances poorly preserved, although *E. dysenteriae* and *E. coli* on the same slides gave excellent demonstrations.

**DISCUSSION.**

I have not been able to discover in the literature any reference to an amoeba, either parasitic or free-living, with the essential characters of the species under consideration. While the free-living species, *Amoeba limax* auct., is usually figured with one end considerably broadened and the other narrowed and covered with villous ectoplasmic structures, authorities on the group, like Dolfin (1916), make no further commitment than that this species, in moving forward, assumes a finger-like contour. No statement is found to the effect that the organism always preserves this same polarity. On the other hand, no parasitic amoeba is described other than the type designated as *Councilmania lafleuri* (Kofoid and Sweezy, 1921), which has been observed to be at the same time phagocytic for red blood corpuscles and bacteria. Even without any specific knowledge of the life cycle of the Chinese species, there is no likelihood of confusing these two forms.

While certain specimens of dysentery amoebae from Cochin China, figured by Noc (1909, Pl. 10, Figs. 15, 20, 21, 22, 23) might, from their contour, be regarded as belonging to the species herein described, the position of the nucleus with reference to the anteroposterior axis is essentially different.

Minchin (1922) raises the question as to the possibility of such forms as *Amoeba limax* being only physiological varieties of other (and, perhaps, less differentiated) species. While that same note of caution may well be kept in mind in the present discussion, there is no evidence that this form in the amoeboid stage with such a pronounced polarity should revert to a more primitive stage, such as Valkampfia does, in which species the differentiation is a flagellation at the anterior end in the retro-amoeboïd condition.

Because of the uniqueness of this species of entamoeba, it seems necessary to regard it as a new species of dysentery producing protozoan, and to create for it a new genus, *Caudamoeba*, designating the species as *Caudamoeba sinensis*.

**CAUAMOEBA NOV. GEN.**

Entamoeba, measuring 16-17 microns in diameter when contracted; parasitic in man; with anteroposterior polarity.
Anterior end broadly lobose, posterior region more narrowed, posterior extremity drawn out into caudostyle, surrounded by villous protoplasmic projections. Posterior region highly vacuolate. Nucleus spherical, measuring 3 to 4.5 microns in diameter; nuclear chromatin consists of minute particles distributed over inner surface of nuclear membrane, and connected by delicate achromatic fibrils; karyosome delicate, star-shaped clump with hollow centre, lying in centre of nucleus which is always near the anterior margin of organism. The amoeba is capable of ingesting both red blood cells and bacteria and is the etiological agent of a dysentery.

Type and only known species, *Caudamoeba sinensis*, with the characteristics of the genus.

**Distribution:** Reported thus far only from North China.

**Clinical Aspects of the Species.**

There seems little likelihood of escaping the conclusion that the organism, *Caudamoeba sinensis*, is an etiological entity responsible for amoebic dysentery. In all four cases under consideration, the organism contained red blood cells. In the first two cases it was the only suspicious organism found over a period of ten days, during which time samplings of every stool passed were examined. In both Case 1 and Case 2 the dysentery abated with the disappearance of this organism from the stool. In Case 3 and Case 4 the preponderant infection with other pathogenic organisms is sufficient to explain the condition following the disappearance of *C. sinensis* from the stool. *Caudamoeba sinensis* is apparently killed by emetine treatment. In Case 1 the organisms disappeared from the stools and the dysentery abated four days after the first treatment with emetine bismuth iodide, and did not appear on subsequent examinations. In Case 2 it disappeared on the sixth day following the first diagnosis and treatment, although the condition was greatly improved on the fourth day. In Case 3 and Case 4, the new species disappeared several days before *E. dysenteriae* was negative in the stool, while in Case 1, Case 2, and Case 3, where follow-up examinations were made, no recrudescence of *C. sinensis* infection was found. The drug administered is, therefore, not only a specific for the infection, but is apparently even more successful than it is in *Entamoeba dysenteriae* infection.
The seat of the infection is not known except from clinical symptoms, which all point to its residence in the tissues of the large intestine.

**Summary.**

1. *Caudamoeba sinensis* nov. gen., nov. spec., a new amoeba from man, is described.

2. The organism is characterized by viscous endoplasm, thin layer of ectoplasm, antero-posterior polarity, lobose anterior and attenuate posterior end drawn out into a caudostyle, which is surrounded at times by a group of protoplasmic projections more or less conspicuous, a constant movement of the organism away from the caudal end, and a nucleus near the anterior end of the body with minute chromatin granules just within the nuclear membrane, together with a karyosome specifically different from that of the described entamoebae of man.

3. The organism was found in fecal examination of four dysentery patients in the Peking Union Medical College Hospital, all from North China. It is phagocytic for red blood corpuscles and for bacteria, and in two instances was the only micro organism in the stool suspected of being pathogenic.

4. Cases containing only this organism in the stools gave typical history and symptoms of amoebic dysentery.

5. Emetine is a specific for the infection. The organism succumbs in the course of a few treatments and does not reappear in the stool after a course of treatments. In this respect it is apparently more amenable to treatment than *Entamoeba dysenteriae*.

**Literature Cited.**


Doflein, F. 1916.—Lehrbuch der Protozoenkunde. Jena. 1190 pp., 1197 figs. in text.


Plate XXII.

NEW AMOEBA IN MAN. (FAUST.)
Plate XXIII.

NEW AMOEBA IN MAN. (FAUST.)
New Amoeba in Man.

Explanation of Plate XXII.

Figs. 1-4)

Fig. 1.—Caudamoeba sinensis, quiescent organism, showing \( n \), nucleus; \( r \), red-blood-corpuscles; \( v \), vacuoles; \( f \), food-inclusions. The caudostyle \( c \) is surrounded by \( d \), a mass of débris.

Fig. 2.—Elongate motile specimen.

Fig. 3.—Specimen of Caudamoeba sinensis pivoting around the caudostyle.

Fig. 4.—Pre-cystic stage of C. sinensis.

Figs. 5-20.—Free-hand sketches of C. sinensis, at intervals of ten seconds, showing relation of nucleus and caudostyle to the antero-posterior axis of the organism.

Explanation of Plate XXIII.

Figs. 21 and 22.—Instantaneous photomicrographs of C. sinensis, showing red blood corpuscles.

Fig. 23.—Photomicrograph of fixed specimen of C. sinensis, killed in active condition. Stained with iron-alum hematoxylin.

Fig. 24.—Photomicrograph of fixed specimen of C. sinensis, killed in active condition. Stained with iron-alum hematoxylin. Note the character of the karyosome.

Fig. 25.—Photomicrograph of fixed specimen of C. sinensis, elongated, killed while quiescent. Note nucleus at anterior end.

Fig. 26.—Photomicrograph of fixed specimen of C. sinensis, pre-cystic condition. Note nucleus chromatin and central karyosome. The dark mass at the posterior end is an area of vacuoles. All the photomicrographs are enlarged 1,300 diameters.

A STUDY OF THE VITAL CAPACITY IN CHINESE.*

John H. Foster, M.D., Changsha, Hunan.

The subject of the vital capacity of the lungs in health and disease has been of considerable interest to the medical profession and prominent in medical literature during the past five or six years. The spirometer as an instrument of clinical precision was introduced by Jonathan Hutchinson in 1846, at which time he made careful observations on nearly two thousand individuals and laid the foundations of the present knowledge of this work. The more widespread interest and use of the spirometer of late is the result of the investigations of a number of scientists. Dr. Peabody, who addressed us at the opening of the Peking Union Medical College, 1921, on the subject of "The Clinical Importance of the Vital Capacity of the Lungs," has been one of the foremost of this group.

*From the Department of Medicine, Hunan-Yale College of Medicine, Changsha.
The vital capacity of the lungs is defined by Howell as "the volume of air that can be breathed out by the deepest possible expiration after making the deepest possible inspiration." Anything which interferes with the free movement of the lungs or of the entrance of air into them will decrease the vital capacity. Thus pleural effusions, fluid in the peritoneal or pericardial cavities, emphysema, pulmonary consolidation or edema will do this. It has been shown experimentally that engorgement of the pulmonary vessels, due to back pressure from the left heart, will lower the vital capacity, which may then be considered as an index of the pulmonary circulation. The vital capacity, therefore, is a functional test which tells merely of decrease in the power of the lungs to expand or to collapse. Abnormal changes of the vital capacity do not indicate any specific disease, but merely point to some disturbance which must be explained by clinical findings.

Clinical Application.

Reports of studies on the vital capacity in disease of the heart and lungs have become quite numerous. Meyers, Jennings and Wittich, in an early report from America, found that in pulmonary tuberculosis there was a definite diminution in the vital capacity, but did not find a very constant relationship to the grade of the disease. They urged the further use of this test as an aid in the more accurate classification of cases, also as a help in prognosis and as a guide to treatment. Cameron, in England, in 1922, reported the results of 6,000 observations on patients with pulmonary tuberculosis. He states that the vital capacity is always reduced in pulmonary tuberculosis, and that with certain reservations it is reduced in proportion to the grade of the disease, and that it varies with the state of the patient, increasing when improvement takes place and decreasing during periods of physical retrogression. Meyers, later, reporting 335 cases of pulmonary tuberculosis which had been carefully studied and checked by X-ray examination, found a decrease in vital capacity in groups classified as "far advanced," "moderately advanced," and "early," which corresponded roughly to the grade of the disease. There were numerous exceptions, however, where the vital capacity was normal or only slightly reduced. He made no comment at all on the relation of vital capacity to the progress of the disease.
Patients with bronchial asthma showed very marked decrease in vital capacity, to as low as eighteen or twenty per cent of normal, during the acute attacks, but during the interim there was no uniform decrease.

Pneumonia, Meyers claims, reduces the vital capacity from the very beginning of its course more than any other acute disease of the respiratory tract, and that this test is therefore a valuable aid in early diagnosis. During convalescence the vital capacity is a guide to the clearing up of the lesion and is of great value in determining cure and the patient's ability to work.

Peabody has shown that in cardiac disease the development of dyspnea is accompanied by a decrease in vital capacity, which is roughly quantitative, that it is a valuable index to the tendency to dyspnea, and incidentally to the clinical course and prognosis of the disease.

The following cases from our medical service are illustrative of the value of vital capacity records in cardiac disease.

**Case 1.**—The patient (Fig 1), Chen Yang Shih (陳楊氏), 42 years of age, a Chinese housewife, was admitted to the Hunan-Yale Hospital on April 29th, 1922, with chronic cardio-vascular disease and auricular fibrillation, in an extreme state of decompensation. One week after entrance, when the edema had begun to disappear, the pulse deficit had decreased, and she had begun to take an interest in life, her vital capacity was 600 c.c. She gradually improved. The vital capacity readings, taken about a week apart, show quite graphically the clinical improvement in her case. At the time of discharge, with a vital capacity of 2,500 c.c., she was walking around and went home in good condition.

Fig. 1.—Chen Yang Shih. The rise in vital capacity corresponds to the improvement in general condition after acute decompensation.
Case 2.—The second case, Hu Mali Shiib (胡馬氏) (Fig. 2.), 34 years of age, also a case of auricular fibrillation, was admitted to the Hunan-Yale Hospital on June 24th, 1922, extremely decompensated. One week after admission her vital capacity was 1,500 c.c. Two weeks later, at the time of discharge, when her edema was all gone and she was walking around the ward, her capacity had risen to 2,200 c.c. She was readmitted on the 17th of November with another break in compensation. At that time her vital capacity was 1,200 c. c. Her chart shows an almost daily increase and the rise indicates the clinical response to treatment. At the time of discharge, fifteen days later, she had reached 1,700 c. c. She still attends the out-patient clinic and has remained compensated, although with markedly limited capacity for any physical activity.

![Fig. 2.—Hu Mah Shih. The clinical course of this case on first and second admission to the hospital is well shown by the vital capacity record.](image)

Case 3.—This chart, (Fig. 3.) is the vital capacity record of Lo Fan Shiib (羅范氏), a case of chronic endocarditis with cardiac hypertrophy and decompensation, who was in the ward of the Hunan-Yale Hospital for seven months. She was a woman of 32 years of age, who was admitted on September 21st, 1921, in a badly decompensated and almost hopeless condition. Improvement was slow, but edema gradually disappeared, fever subsided and the dyspnea became less marked. The first vital capacity record, which was taken eleven weeks after admission, was 1,300 c. c. One week later (December 9th) she was allowed out of bed in a chair for the first time. Her vital capacity had risen to 1,800 c. c. During December, January, and February she was out of bed part of each day and symptoms were quiescent, except for a slight rise in temperature, general weakness and some precordial distress. In the latter part of February she had an attack of acute follicular tonsillitis, and soon after developed an acute multiple arthritis. On March 8th there was noted an increase of cardiac symptoms and signs, and by the twenty-first there was a definite break in compensation with signs of an acute endocarditis. There was a return of dyspnea and edema. Temperature and pulse rose. The vital capacity had dropped to 1,200 c.c. and later to 1,000 c.c. The succeeding five weeks
showed increasing weakness, anasarca and anemia, with more marked cardiac signs, and on April 24th she was sent home to die, after 218 days in the hospital.

In the above cases, and in others, the clinical condition of the patient and the progress of the disease is graphically shown by the vital capacity chart. It has proved to be more valuable in cardiac disease as an index of the patient's condition, and of the course of the disease, than the pulse or blood pressure records. It has been as indicative of the course as the temperature record is in typhoid fever.

Peabody⁸ has shown that patients can be classified according to their percentage of the normal vital capacity and that valuable information may be had as to the prognosis and the capacity of the patient for work.

**Normal Standards**

In order to bring the spirometer into more general use we need (1) a simple instrument; (2) accurate normal standards, with appreciation of the normal limits; (3) knowledge of the factors influencing the vital capacity.

The first is well standardized.⁹ There are a number of instruments on the market, which although cumbersome, are easy to manipulate and they are accurate, provided the co-operation of the patient can be obtained.

As to accurate normal standards, the variations in the vital capacity in normal individuals are often considerable, varying, more or less closely, with certain body measurements. Hutchinson
found the body height the most reliable guide, and suggested this as a standard. The relation of the vital capacity to height, weight, body surface and chest volume has been investigated for different groups of individuals. The ratios of the vital capacity to height and to body surface have been accepted as the most reliable, and standards have been adopted in terms of liters per square meter of body surface, and also in cubic centimeters per centimeter of body height.

West, after an analysis of figures obtained from eighty-five Harvard medical students and forty-four nurses from the Peter Bent Brigham Hospital, Boston, decided on 2.5 liters per square meter of body surface for men, and 2.0 liters per square meter of body surface for women as normal standards. Another standard of 25 c.c. per cm. of height for men, and 20 c.c. per cm. of height for women, was given as being almost as accurate. Men with an athletic history were given figures of 2.8 for surface, and 29.0 for height ratios, respectively.

Wilson and Edwards, from a study of 362 school children from six to sixteen years of age, adopted standards for children of 19.3 for surface and 15.5 for height ratios. They found the height ratios slightly more accurate than the body surface.

At present the above figures are the standards in use in America.

There are also a number of factors, aside from the differences in physical development, which affect the vital capacity in health and disease, such as bodily strength, weakness and fatigue, athletics, posture, age, race, occupation and social environment. The proper evaluation of results depends on the knowledge of these factors.

Investigation

In taking vital capacity measurements of Chinese during the routine physical examination of students of "Yale in China," and of the city schools of Changsha, also of patients in the Hunan-Yale Hospital, it was found that the vital capacity of apparently healthy Chinese fell considerably below the standards adopted for Americans. An investigation was therefore undertaken to determine a normal standard for Chinese, and, incidentally, to study the effect of occupation on the vital capacity.

Records of nearly six hundred apparently healthy Chinese were obtained.* The spirometer, a spring platform scales and the measuring rods were taken in a ricksha to a number of shops, soldiers and police barracks, coolie hongs, street corners, the lobby of the city Y.M.C.A. and to a girls' school. The vital capacity, height, weight, and data as to name, age and occupation were obtained from all who could be persuaded to participate in the test. The use of the spirometer was explained and demonstrated, and each person given two or three tries. The heights were recorded in, or transferred to, the metric system and corrections were made for clothing and shoes. Five hundred of the cases were then grouped according to occupation. Body surface was determined by use of the DuBois Chart (Fig. 4.). When the body height is given in centimeters and the weight in kilograms, the surface area, in square meters, can be read at a glance. Ratios of vital capacity to height and to body surface were obtained by simple division.

*Fig. 4.—Chart for determining surface area of man in square meters from weight in kilograms and height in centimeters (DuBois and DuBois, Arch. Int. Med., June, 1916).

The results were then tabulated and averages found for each group and for the totals.

*Most of these records were obtained by Dr. P. L. Hsieh, of the Norwegian Hospital, Yi Yang, Hunan, during his service as clinical clerk in the Hunan-Yale Hospital in the spring of 1922.
Results of Investigation.

Referring to Table 1, we can see in brief the results of this study which has been reported in more detail elsewhere.

Table 1.—A Comparison of Averages of Vital Capacity Measurements in Eleven Occupational Groups of Five Hundred Chinese and Twenty-Five Foreigners.

<table>
<thead>
<tr>
<th>Group</th>
<th>Occupation</th>
<th>Number</th>
<th>Average Vital Capacity</th>
<th>Average Height</th>
<th>Average Weight</th>
<th>Average Body Surface</th>
<th>Surface Ratios</th>
<th>Height Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Soldiers</td>
<td>97</td>
<td>3070</td>
<td>164.0</td>
<td>55.0</td>
<td>1.63</td>
<td>1.89</td>
<td>18.8</td>
</tr>
<tr>
<td>2</td>
<td>Policemen</td>
<td>40</td>
<td>3270</td>
<td>163.0</td>
<td>54.4</td>
<td>1.55</td>
<td>2.09</td>
<td>19.7</td>
</tr>
<tr>
<td>3</td>
<td>Workmen</td>
<td>49</td>
<td>3160</td>
<td>162.0</td>
<td>54.0</td>
<td>1.55</td>
<td>2.03</td>
<td>19.5</td>
</tr>
<tr>
<td>4</td>
<td>Shop Clerks</td>
<td>40</td>
<td>2840</td>
<td>161.0</td>
<td>49.1</td>
<td>1.49</td>
<td>1.90</td>
<td>17.6</td>
</tr>
<tr>
<td>5</td>
<td>House Coolies</td>
<td>43</td>
<td>3320</td>
<td>161.0</td>
<td>54.8</td>
<td>1.56</td>
<td>2.12</td>
<td>20.5</td>
</tr>
<tr>
<td>6</td>
<td>Ricksha Coolies</td>
<td>40</td>
<td>3090</td>
<td>160.0</td>
<td>53.8</td>
<td>1.54</td>
<td>2.01</td>
<td>19.3</td>
</tr>
<tr>
<td>7</td>
<td>Carrying Coolies</td>
<td>40</td>
<td>3240</td>
<td>165.0</td>
<td>56.8</td>
<td>1.61</td>
<td>2.01</td>
<td>19.7</td>
</tr>
<tr>
<td>8</td>
<td>Glass Blowers</td>
<td>40</td>
<td>3280</td>
<td>192.0</td>
<td>52.3</td>
<td>1.54</td>
<td>2.13</td>
<td>20.3</td>
</tr>
<tr>
<td>9</td>
<td>Students</td>
<td>36</td>
<td>3520</td>
<td>167.0</td>
<td>55.2</td>
<td>1.60</td>
<td>2.16</td>
<td>21.0</td>
</tr>
<tr>
<td></td>
<td>Average of</td>
<td>425</td>
<td>3180</td>
<td>163.0</td>
<td>54.7</td>
<td>1.58</td>
<td>2.02</td>
<td>19.5</td>
</tr>
<tr>
<td>10</td>
<td>Women</td>
<td>75</td>
<td>2240</td>
<td>157.0</td>
<td>47.7</td>
<td>1.45</td>
<td>1.54</td>
<td>14.3</td>
</tr>
<tr>
<td>11</td>
<td>Foreigners</td>
<td>25</td>
<td>4360</td>
<td>174.0</td>
<td>69.6</td>
<td>1.83</td>
<td>2.39</td>
<td>25.1</td>
</tr>
</tbody>
</table>

Ninety-seven Hunan soldiers showed an average height ratio of 18.8 and a surface ratio of 1.89. Remember the corresponding American figures are 20.0 and 2.5, respectively. Forty policemen showed slightly higher ratios. A group of clerks in a large silk-shop gave the lowest figures for the men. The workmen group, including carpenters, masons, weavers, farmers and others, gave a height ratio of 19.5, and a surface ratio of 2.03. Groups of carrying coolies and ricksha coolies had almost identical results. The house coolies from the hospital and Y.M.C.A. were considerably higher.
Glass blowers from two glass factories in the city were the highest of any of the laboring groups. The highest ratios of all of the men were found in the group of medical students. The averages for the four hundred and twenty-five men showed ratios of 2.02 for surface and 19.5 for height, quite different from the American standards.

A group of twenty-five foreigners in Changsha were studied for comparison. They gave ratios of 25.1 for height and of 2.39 for surface. This is almost equal to the Western standard and considerably higher than the Chinese.

Seventy-five young women from the Union Girls' School and from the Hunan-Yale Nursing School, from seventeen to twenty-five years of age, gave figures of 14.3 for height and of 1.54 for surface ratios. This is thirty per cent lower than the standard for American women.

After an analysis of the individual and group figures, the flat ratios of 2.00 for surface and of 19.0 for height were chosen as a normal standard for the Chinese of Central China. There was considerable range in the upper and lower extremes, but eighty-one per cent of all the groups were within ninety per cent of the standard. For women, standards of 1.50 for surface and 14.0 for height ratios were taken. The extremes showed about the same deviation from the average as those of the men.

Table 2.—Summary of Normal Standards, Showing the Low Vital Capacity Ratios of the Chinese.

<table>
<thead>
<tr>
<th>Authority</th>
<th>Vital Capacity, Body Surface</th>
<th>Vital Capacity, Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>West</td>
<td>2.50</td>
</tr>
<tr>
<td>Women</td>
<td>&quot;</td>
<td>2.00</td>
</tr>
<tr>
<td>Children</td>
<td>W. &amp; E.</td>
<td>1.93</td>
</tr>
<tr>
<td>&quot;Athletes&quot;</td>
<td>West</td>
<td>2.80</td>
</tr>
<tr>
<td>Chinese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>F. &amp; H.</td>
<td>2.00</td>
</tr>
<tr>
<td>Women</td>
<td>&quot;</td>
<td>1.50</td>
</tr>
</tbody>
</table>
Table 2 gives the standards which have been adopted by different investigators, and shows how low the Chinese stand when compared with others.

Studies on groups in other parts of China should be made, for it is realized that there is considerable sectional variation in the physical stature and development of this people.

COMMENT.

Enough is already known about the vital capacity to appreciate its importance as an addition to our means of clinical observation and record. The spirometer is a simple instrument. The technic is easy. The results are a help in diagnosis and prognosis. Further study of normal individuals is needed, also study of the relation of vital capacity to the progress of disease. It could, and should, be included as a routine in physical examinations, and as a part of the clinical examination and record in cardiac and pulmonary disease.

REFERENCES.

Two Unusual Gynecological Cases.

TWO UNUSUAL GYNECOLOGICAL CASES.

J. R. B. Branch, M.D., Hunan-Yale Hospital, Changsha, Hunan.

1. COMPLETE INVERSION OF UTERUS RESULTING FROM SUB-MUCOUS MYOMA.

The patient, a Chinese woman, aged 47, suffered from the protrusion of a tumor from the vagina.

The family history was negative. Patient indulged in tobacco smoking. Was married at the age of seventeen. Husband is 49 years old and well. No history of disease of ear, nose, or throat; or of tuberculosis, cardiac, renal, or venereal disease. Menstruation began at the age of fourteen; always regular; interval from thirty-one to forty days; duration usually four to five days; it became irregular after the onset of present illness; the last period patient could not remember. She has had three pregnancies. The first when she was nineteen; the child born died of diphtheria when it was 11 years old. In the second pregnancy, at the age of 22, abortion occurred in the third month. At the age of 24 years she had another child, now living and well.

The present illness began eight years ago, when patient was suddenly seized with dull pain in the abdomen, general, and more or less of a continuous character. The condition remained about the same for six days. At the end of that time patient began to notice a bloody discharge from the vagina. The discharge was not profuse, but there was a continuous flow day and night. After this first attack of abdominal pain, she had similar frequent attacks which were accompanied by vaginal bloody discharge. Six months later, in addition to the bloody flow, there was a yellowish, foul discharge. Since then the discharge has varied in amount; frequently it is profuse, occasionally it is scanty, but she has never been entirely free from it. This condition lasted for seven years. About a year ago the bloody discharge began to change in character, becoming whitish instead of yellow. During the past year the pain has been less marked. Fourteen days ago, while patient was straining at stool, she noticed a mass about the size of an egg protruding from the vagina. The mass gradually became larger until at the time of admission to hospital it was about the size of a Chinese rice bowl. It gave her very little pain, and no very marked discomfort.

Physical examination:—Patient is fully developed, but emaciated. No important or positive findings in eye, ear, nose or throat, chest, or abdomen. On examining the pelvis, the patient being anaesthetized, a mass with a pedicle was found protruding from the vulva, about the size of one's fist, filling the vaginal outlet. It was of an angry red colour, with areas of superficial desquamation. The distal end was knobbed and of a dirty,
yellowish-grey colour. It bled easily. On introducing retractors the upper limits of the tumor were seen to pass off smoothly to the vaginal mucous membrane. There was no sign of the cervix. A sound introduced into the bladder showed that this organ was pulled down somewhat on to the anterior surface of the tumor. On bi-manual examination the pelvis was found to be abnormal.

The diagnosis was simple. The history during the past eight years of uterine hemorrhage and of a discharge that has recently assumed a yellowish-white appearance indicated an infected mucous myoma. A complete inversion of the uterus, including the cervix, is rarely seen, which is one reason for reporting this case. The other point of interest is the method of dealing with this condition. It is perfectly obvious that an inversion of the uterus of this duration, following the growth of a myoma in the fundus, should not be reduced; the uterus must be removed. The technique employed in the operation for its removal greatly simplifies the procedure and reduces the possibility of injury to the neighbouring organs to a minimum. By employing the method of bisection which has been used by Dr. Howard A. Kelly, of Baltimore, exposure of the important blood vessels, which would otherwise have been extremely difficult, was used here to great advantage.

The operation is performed as follows. The inverted fundus is grasped with a pair of large Kelly bisection forceps and pulled well down. The bladder is dissected free from the uterus. After applying bisection forceps to each side, the uterus is split down in the middle through the submucous myoma at the fundus, and the peritoneal covering of the uterus exposed. The round ligaments, utero-ovarian, and mesosalpinx are doubly ligated with catgut on each side, and cut. The uterus, having been split down to the cervix and the uterine vessels on each side clamped both from within and without, is removed by amputation through the cervix. The uterine vessels are secured with chromic catgut passed through a portion of the cervix on the cervical needle; the round, broad, and utero-ovarian ligaments are sutured together in the median line and sewn into the cervix, which is then closed with chromic catgut, a cigarette drain having been previously inserted through the cervix into the cul de sac. The vaginal mucous membrane is approximated horizontally with catgut and the vault packed with two gauze gauze sponges.
The patient's convalescence was entirely uneventful and uninterrupted. She was discharged on April 8th, 1923, perfectly well.

2. Calculus in the Female Urethra.

The second case was also unusual. Patient was a young Chinese woman, aged 21. She was born and brought up at Chiao Ho, in Southern Hunan, near the Kwangtung border, and has only recently come to Changsha. Married at nineteen. Now in fourth month of pregnancy. Complains that a hard mass has been in the urethral meatus for five months. Family history and habits good.

Patient's present illness commenced about one year ago, when she began to notice dribbling of urine. The onset was gradual, but the incontinence has increased rapidly during the last few weeks, so that her trousers are soiled all the time. About five months ago she begin to notice a mass situated between the vagina and urethral meatus. It was elliptical in shape, hard, and of about the size of a silver dollar.

Physical examination.—Patient is fully developed and well nourished. On examination the following note was made: "There is a smooth egg-shaped mass nearly filling the vaginal orifice. It extends from the urethra almost to the posterior vaginal wall and separates the labia by its width. It is stony hard and the parts adjacent are tender. One finger can with difficulty be introduced into the vagina posterior to the mass, as it nearly fills the vaginal orifice. A grayish, hard substance is seen and felt at the meatus. It is evidently a urethral stone, about the size of an egg and lying in the urethra."

Laboratory findings.—Urine showed trace of albumin. Ova of ascaris and trichuris in faeces. Blood count, normal on admission. No evidence of malarial infection.

Urethral stones in women are rare owing to the shortness and greater laxity of the urethral canal. This was long ago commented on by Celsus. A review of the literature at our command shows that the condition is extremely infrequent in China. We have in this district very few calculi of the urinary tract. I can only remember three cases in the past seven years. Dr. J. Oscar Thomson, of Canton, has reported (in Surgery, Gynecology and Obstetrics, and in the China Medical Journal) a total of no less than 3,500 cases of stone seen in the Canton Hospital, Canton. Only two per cent of the patients were women, and he found among them no case of urethral stone. In the Hunan case here reported a large vesical calculus had dilated the sphincter vesicae and protruded into
the urethra. In looking over her history one is surprised to note that the only symptom for a long while, until very recently, had been that of dribbling of urine. It is also interesting to note that the patient was four months pregnant, and from examination one would gather that the stone must have grown considerably during this period. Marital intercourse in the condition she was in would, I believe, be extremely difficult. With a calculus of this size we felt that its removal could be done more easily and with less traumatism by an incision along the posterior urethral wall than by attempts to crush and remove it piecemeal. Accordingly, the patient having been anaesthetized, an incision was made over the posterior urethral wall and the stone removed. There was no definite diverticulum. The entire urethra was symmetrically dilated from the external sphincter to the meatus. Some of the redundant urethral wall was trimmed away. A catheter was introduced through the meatus into the bladder and the urethra reconstructed over it as a guide. This was done in three layers, using fine chromic catgut which did not pierce the urethral mucosa. The catheter was left in situ.

The patient made an uneventful recovery, although there is still some dribbling of urine. This is probably due to the stretched fibres of the sphincter which have not yet recovered their tone. If this does not occur spontaneously, a plastic operation on the sphincter muscles will be done later. A cystoscope introduced into the meatus showed that the incision had healed perfectly with no leaking.
CANCER AMONG THE CHINESE.

The cancer problem is not one of race or country, or even entirely of species, for malignant tumours are not confined to *Homo sapiens*. It would seem that their distribution is much more general than was once supposed, and the more that countries are opened up freely to modern medicine the less uneven the distribution of cancer seems to be. While this would appear to be generally true, there is little doubt that civilization has a definite effect in increasing the cancer rate and that primitive races are less frequently attacked by the disease. One factor in this contrast of racial incidence must undoubtedly be that in races with a modern civilization the expectation of life is relatively very high, and as carcinomata, at least, are growths affecting aged tissues, their frequency should increase, and actually does increase, *pari passu* with this expectation. But while this may be a considerable factor, it is very far from being a sufficient one.

Among the Chinese, a people whose recorded history dates back further than almost any other, the expectation of life is still very low, yet the cancer rate is a very considerable one, so mere age must be anything but a deciding factor. Little is known about the incidence of cancer in different parts of China or of the relative frequency with which the disease attacks different organs. What we do know about it only renders the problem more difficult. In Europe and America, for instance, cancer of the breast occurs with appalling frequency and is accounted for by the fact that the mammary tissue degenerates early, that is at the age when its functions are completed. In other words, the rule is maintained that cancer occurs in aged tissues even though the individual may not be old. But how then account for the relative infrequency of breast cancer in Chinese women? Though not extremely rare among them, the incidence is very much less than in European women. Moreover, if there ever was an organ that suffered chronic ill-treatment it is the breast of the Chinese working woman. Children are allowed to suck from one to three years and even longer, certainly long after they have a fairly complete set of teeth, and abrasions
and injuries of the nipple are very common. Why is cancer of the breast less common among Chinese than among European women? And according to Hoffman's statistics (Jour. Amer. Med. Assoc., November 17th, 1923; Ch. Med. Jour., January, 1924), there is also a surprisingly low death-rate from cancer of the breast among the women of Japan.

Cancer of the stomach is appallingly common in the West and relatively infrequent in China, yet among people in the south of China the stomach is chronically overloaded with rice, functional diseases of the viscus are extraordinarily frequent, and gastric and duodenal ulceration by no means rare.

On the other hand, cancer of the cervix of the uterus is probably as common, or almost as common, in China as in Europe, and occurs, we believe, at an earlier average age. We have seen one patient at the age of 24 years in an advanced stage of the disease.

In a paper, an abstract of which is published in this issue of the Journal, Snijders refers to the frequency of primary cancer of the liver as far from rare; but that the disease is primary in that organ seems to us to require very much more careful elucidation.

Snijders also mentions a point of very great interest to workers in parts of South China. He points out the frequency of buccal cancer, apparently the result of betel chewing, in some parts of the Orient and its rarity in others. A recent article in the British Medical Journal, by R. L. Spittel, F.R.C.S., attributes to betel chewing the great frequency of buccal cancer in Colombo, and writers from India have again and again laid stress on this as cause and effect. Now the mixture chewed is apparently the same everywhere, viz., betel-nut split in half, with a little lime and catechu inserted between the halves and the nut wrapped in a leaf. Exactly the same mixture is chewed by a large number of the natives of South Formosa. We are unable to say for certain that the leaf used for wrapping the nut is the same; otherwise there is no difference at all. Yet in Formosa buccal cancer is not specially common and does not in any way compare in frequency with cancer in other situations. Why this difference?

It may be noted, however, that in China we have one form of cancer peculiar to the country. In the province of Kansu the most common form of carcinoma (King, Ch. Med. Jour., 1919) is the epithelioma over the great trochanter induced by irritation from
Cancer in Hongkong and Shanghai.

sleeping on the hot k'ang (brick stove-bed), and this may be very aptly compared to the kangri burn cancer of India. Here we have a common source of irritation and a common resultant disease, which only tends to make the question of betel-chewing cancer more obscure.

It is very evident that the whole subject of cancer, its distribution and incidence in China, requires much more careful study. There is a danger that in the experimental investigation of the disease, though this is undoubtedly of great value, simpler lines of approach to more accurate knowledge should be neglected. Verbum sat sapienti.

James L. Maxwell.

CANCER IN HONGKONG AND SHANGHAI

In the "Journal of the American Medical Association", February 9th, 1924, F. L. Hoffmann writes as follows: Through the kindness of the Statistical Division, Army Medical Library, Washington, D. C., there have recently come to me some rather interesting cancer data for the European and Chinese population of Hongkong, and the European population of Shanghai which may be interesting to the medical profession and to those concerned with cancer investigations otherwise.

The Hongkong data are for the period 1911-1920.

Mortality Statistics of Cancer in Hongkong, 1911-1920

<table>
<thead>
<tr>
<th>Year</th>
<th>Foreign Population</th>
<th>Deaths from Cancer, Foreigners</th>
<th>Rate per 100,000</th>
<th>Chinese Population</th>
<th>Cancer Deaths Among the Chinese</th>
<th>Rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>18,837</td>
<td>5</td>
<td>26.5</td>
<td>354,790</td>
<td>36</td>
<td>10.1</td>
</tr>
<tr>
<td>1912</td>
<td>21,163</td>
<td>6</td>
<td>28.4</td>
<td>446,614</td>
<td>37</td>
<td>8.3</td>
</tr>
<tr>
<td>1913</td>
<td>21,470</td>
<td>5</td>
<td>23.2</td>
<td>467,644</td>
<td>46</td>
<td>9.8</td>
</tr>
<tr>
<td>1914*</td>
<td>20,710</td>
<td>7</td>
<td>38.8</td>
<td>480,594</td>
<td>29</td>
<td>6.1</td>
</tr>
<tr>
<td>1915*</td>
<td>13,320</td>
<td>10</td>
<td>75.1</td>
<td>495,840</td>
<td>38</td>
<td>7.7</td>
</tr>
<tr>
<td>1916</td>
<td>13,390</td>
<td>6</td>
<td>44.8</td>
<td>515,620</td>
<td>42</td>
<td>8.1</td>
</tr>
<tr>
<td>1917</td>
<td>13,500</td>
<td>12</td>
<td>88.9</td>
<td>521,600</td>
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<td>8.6</td>
</tr>
<tr>
<td>1918</td>
<td>13,500</td>
<td>4</td>
<td>29.3</td>
<td>548,000</td>
<td>57</td>
<td>10.4</td>
</tr>
<tr>
<td>1919</td>
<td>13,600</td>
<td>7</td>
<td>51.5</td>
<td>545,500</td>
<td>46</td>
<td>9.5</td>
</tr>
<tr>
<td>1920</td>
<td>14,000</td>
<td>8</td>
<td>51.1</td>
<td>634,150</td>
<td>73</td>
<td>11.5</td>
</tr>
<tr>
<td>1911-1920</td>
<td>163,490</td>
<td>70</td>
<td>42.8</td>
<td>4,949,352</td>
<td>449</td>
<td>9.1</td>
</tr>
</tbody>
</table>

* The tremendous decrease in population (foreign) between 1914 and 1915 is probably due to the departure of nearly every able-bodied man to join the armies fighting in Europe.
It is obvious that the rates shown for certain years, at least, are of doubtful value on account of the uncertainty as regards the correct number of foreign residents since the war. Previous to 1915, however, the data may be accepted with assurance of accuracy, and likewise for the last three years.

In view of the fact that the actual mortality is very small, it should not be difficult to subject the returns to a qualified analysis, especially as regards organs and parts of the body affected and according to sex.

The data for the Chinese population are more uniform and not suggestive of very material changes during the period under observation. Nevertheless, the highest rate is recorded for the year 1920, which is several points in excess for seven years of the ten-year period. Here, again, the data regarding organs and parts of the body affected with a due regard to sex would throw much light on doubtful questions concerning the incidence of malignant disease among the Chinese population. The age distribution among the Chinese in question, of course, differs essentially from the foreign element.

**Mortality Statistics of Cancer in Shanghai, 1911-1921**

<table>
<thead>
<tr>
<th>Year</th>
<th>Foreign Population</th>
<th>Deaths from Cancer Among Foreign Population</th>
<th>Death Rate from Cancer per 100,000 Among Foreigners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>13,770</td>
<td>9</td>
<td>65.4</td>
</tr>
<tr>
<td>1912</td>
<td>14,000</td>
<td>7</td>
<td>50.0</td>
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<td>1913</td>
<td>14,250</td>
<td>10</td>
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<td>14,300</td>
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<tr>
<td>1915</td>
<td>18,519</td>
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<td>81.1</td>
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<td>1916</td>
<td>19,050</td>
<td>9</td>
<td>47.3</td>
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<td>1917</td>
<td>19,750</td>
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<td>1918</td>
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<td>90.5</td>
</tr>
<tr>
<td>1919</td>
<td>22,000</td>
<td>13</td>
<td>59.1</td>
</tr>
<tr>
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<td>23,307</td>
<td>15</td>
<td>64.3</td>
</tr>
<tr>
<td>1921</td>
<td>24,000</td>
<td>12</td>
<td>50.0</td>
</tr>
<tr>
<td>1911-1921</td>
<td>203,946</td>
<td>135</td>
<td>66.2</td>
</tr>
</tbody>
</table>

The average cancer rate for the European population of Shanghai for the period under observation was 66.2, which is considerably higher than the average high rate reported for the European population of Hongkong. How far this is the result of the possibly more accurate ascertainment of the population is, of course, open to question. In some years the rate has been
The Cancer Problem in the Tropics.

In a recent report of the Far Eastern Association of Tropical Medicine, E. P. Snijders, of Sumatra, gives the following outline of a paper on "The Cancer Problem in the Tropics," read by him at the Fifth Annual Congress of the Association, held in Singapore, September, 1923:

1. Among the Javanese and Chinese in Deli (East coast of Sumatra) all kinds of tumours occur.

2. In Deli, tumours are not at all rare. As to the malign new growths, the number among our coolies (Javanese as well as Chinese) is not lower than among comparable groups in Europe. The sentence of R. Williams: "In Borneo, Java and Sumatra a single example of a malign tumour is esteemed a great rarity," is certainly obsolete.

3. There are two reasons for this apparent rarity: (1) The tumours do not come under observation because of the failing contact with the indigenous population; (2) the age incidence is not taken sufficiently into account (an orphan asylum is to be distinguished from an asylum for old people). It must be granted to Hoffmann that "even a low cancer death-rate is not necessarily evidence of the intrinsic untrustworthiness of the returns." (vide the relative rarity of cancer of the breast in Japan); but without further investigation we cannot accept his positive conclusions: "the local variations in cancer-frequency throughout the world are primarily conditioned by local causes and not by faulty methods of diagnosis or defective methods of death registration," and "cancer-frequency decreases with diminishing distances from the equator." These conclusions are not yet proved. The available data are insufficient. New and exact investigation is wanted.

4. The site-incidence of the tumours of our list is very remarkable in some respects and merits a thorough consideration.
5. The most striking feature is the high frequency of primary cancer of the liver among the Javanese as well as among the Chinese (in 90 per cent of our cases in cirrhotic livers). The age-incidence is rather low.

6. Cancers of the stomach occur, however. Among the Chinese they hold but the second place, and among the Javanese they seem to be rare. Ulcers of the stomach are very frequent among our Chinese; very rare among the Javanese.

7. Cancers of the buccal cavity are rare among the Javanese; perhaps rather frequent among the Singhalese.

8. Carcinomata of the intestines are rather rare, which is noteworthy in connection with the high frequency of inflammatory affections of the intestines.

9. Penile cancers are rather frequent among our Javanese; probably also among Chinese and Singhalese.

Carcinomata of the portio uteri are rather frequent among Javanese women. The age incidence of both is relatively low.

10. Melanotic new growths are rare.

11. Cystadenomata of the ovary are frequent among Javanese women; fibromyomata uteri, rare.

12. "Simple mixed tumours" are frequently seen (orbita, salivary glands).

13. These conclusions are in accordance with those of other workers in the tropics, especially Daniels and Degorce (for Chinese and Annamites), and as to the primary cancer of the liver, also with the Japanese figures, and the recent figures from Africa concerning the negroes (Mouchet et Pol-Gerard, Appel, a.o.)

14. So the great question: "Why, in general, are malignant tumours rare in the tropics?" is incorrectly posed.

It must run: "Why is the site-incidence of the malignant tumours quite different from that in Europe?"

To get further, for the present we must split up the cancer problem in separate well-posed problems for the separate organs. For example, why is primary cancer of the liver so frequent in many tropical countries as compared with Europe? Why is cancer of the buccal cavity so frequent in Travancore and Saigon, and probably much rarer in Tonkin and the Dutch-Indies, though betel chewing is common in all these countries? Why is mammary cancer rather rare in Japan and probably also among the Javanese, etc.? Only by exact investigation and by well-posed questions can we get exact notions.
Medical Reports.

SHANGHAI: SHANTUNG ROAD HOSPITAL.

Report for Year 1923.

Hospital Staff.—Eleven physicians and surgeons, one dental surgeon, six foreign nurses.

The Report contains an interesting history of the hospital since 1843, when it was founded.

The annual meeting was held on February 29th, 1924. Mr. S. Barton, C.M.G., H.M. Consul-General, presided. He testified to the admiration which the residents of Shanghai had for the great work of healing and service carried on by the hospital, and their respect for the hospital staff who were labouring under disheartening conditions arising from very cramped and inadequate quarters. He referred to the very welcome legacy of Tls. 50,000 from the estate of the late C. S. Taylor. Unfortunately, a considerable portion of this money had to be expended on much-needed repairs to the old buildings.

Sir Edward Pearce proposed the vote of thanks to the visiting doctors and to the hospital staff, and expressed the hope that the Chinese community will subscribe liberally towards the building of a new hospital.

In the report by the Medical Superintendent, Dr. Cecil J. Davenport emphasized the urgent need for modern, fire-proof, convenient hospital buildings to be built as soon as possible.

In the Nurses' School, sixteen male and eleven female nurses are in training. It was one of the pleasing features of the year, indicative of progress in the usefulness of the hospital, that in the summer three nurses passed the examination of the Nurses Association of China and obtained their graduation certificates.

Total number of in-patients, 2,902; out-patients, 104,662. The casualty list shows that patients brought to the hospital injured by vehicular accidents during 1923 numbered 1,455. Cases of attempted suicide, 982: 310 men and 672 women. The principal methods chosen were the swallowing of opium, 416; of match-heads, 341; of gold-earrings, etc., 105; of mercury, copper, glass, and other substances, 97.

The total hospital expenditure was Taels 81,278.17.
CANTON HOSPITAL, CANTON.

REPORT FOR THE YEAR 1923.

The Canton hospital has completed eighty-seven years' service to sick and disabled of all nationalities, creeds, and classes. The large number of 2,000,000 people, chiefly Chinese, have in this institution received the benefits of modern scientific medicine and surgery, and have heard the Christian message. The sum of over one million dollars has been contributed for the work.

The hospital staff includes 17 physicians, 36 nurses, five business officers, three evangelists and 59 non-professionals.

Number of hospital beds, 238; 180 of these are in the public wards. In-patients numbered 20,864, 80 per cent being males and 20 per cent females. Thousands of soldiers of the various Chinese armies at war with each other have been treated in the hospital and dispensaries.

The operations performed were 15,184. The total number of vesical calculi removed in this hospital is now 3,727. Hospital receipts, $87,578.08 Hospital expenses, $118,341.89. Excess of expenses over receipts, $30,763.81. Income from other sources covered this deficit and left a balance of $7,958.12.

As part of the work of the recently organized Health Service, a campaign has been conducted for the prevention and cure of trachoma in the schools; also a campaign against hookworm disease.

In the nursing department there are now 25 pupils, 17 female and 8 male. Six boys and seven girls graduated last year.

As their contribution to the important work of medical education, all the members of the medical staff give lectures and clinics to the students of the Hackett, Kung-Yee and Kwong-Wu medical schools. Plans for organising the medical educational work in Canton on a sound and comprehensive basis are under consideration.

Notwithstanding many difficulties, the great work of the Canton Hospital goes steadily forward, and we must all hope that very soon the hospital with its finances will be in a perfectly satisfactory condition and that all the local physicians and surgeons will heartily support a union scheme of medical education.
Number of Members of Faculty and Instructors, twenty.

The most important feature in the development of the schools during 1923 has been the progress of the plans for putting the institution on a co-educational basis. The minimum amount of capital funds required for this undertaking is G. $165,000. The China Medical Board has promised G. $50,000 and the supporters of the school are to find the balance.

The standard of education is being steadily raised. A larger knowledge of the English language is now required as a preliminary to entrance, and further instruction is given during the medical course, so that it will be possible for students more and more to use English medical text-books and periodicals.

The student enrolment for the fall term was 84, and for the spring term 77. In January, 1923, a class of 13 graduated, and all are serving as internes in various hospitals in China. It is gratifying to note that a large proportion of the alumni are serving in mission hospitals although they could obtain a much higher income elsewhere. Of the 107 graduates of the last five years 94 are in mission hospitals, 11 are in government service, and 2 in private practice.

Included in the report are notes on the work of the hospital and of the Nurses’ Training School. Dr. Houghton, of the China Medical Board, who recently visited the school, reports that the new buildings which house the women of the staff and student body are attractive and substantial and that the new co-educational step appears to have been made with smoothness and mutual satisfaction. The growth of the School of Medicine also impressed Dr. Houghton as holding promise that its work will become a model of union enterprise in the missionary programme.

WEIH SIEN, SHANTUNG.

REPORT OF AMERICAN PRESBYTERIAN MISSION HOSPITAL FOR 1922-1923.

HOSPITAL STAFF: DRs. Ewers, Murray, and ten Chinese physicians. NURSING STAFF: Miss R.A. Brack, Mrs R. M. Mateer, 6 Chinese female nurses, and 7 Chinese male nurses.
Funds to the amount of $30,000, U.S. currency, have been received for the building of a new hospital. As prices have gone up over 40 per cent. since the original estimate was made, the plans have had to be revised. Instead of sixty beds the new hospital will have forty, and the purchase of an expensive X-ray plant must be deferred. Work among the students has been continued and the incidence of trachoma and other communicable diseases reduced. Kala-azar is prevalent in the district. Out of 70 patients, 30 were cured, 7 did not improve, 13 died, and 20 are still under treatment. The deaths were the result of complications; seven patients died from tuberculosis. Number of in-patients treated during the year, 590; average stay in hospital, 20 days. Operations performed, 677. Hospital expenditure, $18,580.07.

THE TREATMENT OF SPRUE: BASED ON A NEW THEORY OF CAUSATION.*


Early in 1923 my preliminary communication on a New Theory as to the Causation of Sprue was published in the Transactions of the Royal Society of Tropical Medicine and Hygiene. By the kindness of the physicians to the Hospital for Tropical Diseases, Endsleigh Gardens, I have within the last few months been given opportunity for putting the treatment based on that theory to the test in several cases with such marked success that I think the time has come to place a few of them on record and to speak in a little more detail of the theory and its application.

Sprue is a disease which appears to be considerably on the increase in recent years, especially in the East; it leads to much sickness and incapacity, is the cause of extensive invaliding from the tropics, and is responsible for not a few deaths. Treatment of the disease is almost entirely empirical, and the results very uncertain, return to the tropics being, in a large majority of cases, followed by relapse usually within a short space of time.

Case 1.—Male, aged 48, born in England; in South Africa 1902-05, in the West Indies (Jamaica) 1910-19, in China 1919-21. With the exception

of an attack of enteric fever in 1918 he enjoyed excellent health until the
onset of symptoms of sprue in 1920. During the next 18 months practically
every known form of treatment was tried—milk, the Salisbury diet, liver
soup, emetine injections, vaccines, yellow santonin, with only temporary
benefit, any attempt to pass on to ordinary diet causing a relapse. This
case was severe, all the typical symptoms being present—acidity, flatulence,
marked mouth symptoms, large, pale, frothy, pultaceous motions, trouble­
some cramps in the limbs, loss of over 3 stone in weight. At one time,
 apart from general tenderness of the tongue, there were over 30 aphthous
patches on the tongue, fraenum, and buccal mucous membrane, and, judging
from the pain on swallowing, probably along the oesophagus also.

New Treatment.—The patient was invalided to England, arriving
March 22nd, 1922, and was taken into hospital the following day. Improve­
ment followed a strict milk diet, but within six weeks of leaving hospital a
relapse occurred in July, another in September, and a third in December, by
which time the condition was almost as bad as it had ever been. There was
troublesome acidity, with aphthae in the mouth, a tender, raw, red tongue,
and cramps. The weight had decreased by nearly 2 stone; the stools, which
had become a little darker in the intervals between the relapses, though
never normal, were again pale, large, and frothy. Calcium lactate, 10 gr. in
cachets, was given twice daily, the dose being increased to 15 gr. a few days
later, and then thrice daily. Some improvement followed, but in another
fortnight, in spite of the continuance of the calcium, matters returned to
their former state. Blood tests showed that the total calcium content was
not diminished and the inference was that, if the calcium was at fault, the
error lay somewhere in its regulation and metabolism. On Jan. 8th, 1923,
the calcium lactate was reduced to 10 gr. three times a day, and a small dose,
1/20 gr. parathyroid extract (Parke, Davis and Co.) morning and evening.
The symptoms were checked, but there was no definite improvement, so on
the 16th the latter dose was increased to 1/10 gr. twice daily. There were
then four very painful aphthæ in the mouth and a small tender papule.
The latter usually preceded the ulcer stage by 48 hours or so. By January
22nd the papule had not developed, but had disappeared, three of the ulcers
had completely healed, and the other, the largest, was nearly well and was
no longer painful, and the tongue was very slightly tender. Two days later
the stools were formed, brownish in colour, and rarely more than one a day.
There was a feeling of well-being, and there had been no cramps since the
20th. On January 30th the parathyroid was reduced to half the dose, and the
diet, which had been restricted to milk till the 24th and milk pudding subse­
quently, was increased to include fish, chicken, and vegetables. By February
10th ordinary full diet was being taken, and on the 12th both drugs were
discontinued. There had been no fresh aphthæ or cramps, and the stools were
formed and almost normal in colour. The weight rapidly increased, and by
March 10th had reached 2 lb. above the normal for the previous 15 years.
Since then the patient has been on ordinary diet, doing full work, and there
has been no set-back whatever, nor sign of any relapse.
This case has been recorded fully because it was the first in which the new treatment was tried. The remainder may be described more briefly.

**Case 2.**—Female, aged 40, married, two children. Born in Ceylon, came to England at the age of 12 years, returning to Ceylon in 1912 and staying there for three years, during which period she had an attack of dysentery and of dengue. In 1919 she went again to Ceylon, and had good health until May, 1921, when she suffered for a week with a sore and tender tongue. For the succeeding two months she was free from this, but thereafter had frequent recurrences, together with indigestion, heartburn, and flatulence, with large, pale, frothy stools.

**New Treatment.**—This state of affairs continued until September, 1922, when the patient was sent to England. A week later her condition was recorded as follows. Tongue sore, tender and red, with ulcers on frenum, cheeks, and gums, motions large, pale, frothy, especially in the early morning, but not infrequently during the day also. She was treated at home by restriction to milk diet, but though the number of motions was reduced they remained very pale, and the weight steadily diminished. She came into hospital on Feb. 15th, her weight then being 107½ lb. She was given calcium lactate, 10 gr. t.i.d., with parathyroid, 1/10 gr., morning and evening, together with a plain milk diet; in a week the aphthae had cleared up and no fresh ones had appeared. The stools on admission were typical. At the end of the month—i.e., a fortnight after starting the treatment—the colour was coming back in the stools, though they were still pale. She was then given Benger's food in addition, and the heartburn and flatulence returned, but ceased when the food was taken off. The weight improved, and by March 11th was 111½ lb., and she was taking biscuits, fish, milk puddings, and eggs. She left hospital a fortnight later. All medicine was stopped during the first week of April. The weight continued to increase till it reached her normal (9 stone), and there has been no return of symptoms.

**Case 3.**—Male, aged 62. Born in Scotland; went to the tropics (San Domingo) in 1888. In 1896 suffered from "ulceration of the mouth," which cleared up with local treatment. He had yellow fever in 1896; and returned home in 1898. Was in the West Indies again in 1905, 1910, 1912, and 1921. In 1909 he suffered from recurrent attacks of diarrhoea, with a tender and painful tongue and loss of weight. These symptoms recurred intermittently for the next 11 years. By 1921 the diarrhoea was persistent; the condition was diagnosed "intestinal catarrh," but did not yield to treatment. The following year a specialist diagnosed "chronic pancreatitis," but no treatment proved of any avail. In 1923 a third physician told him that the disease was sprue, and he was put to bed on strict milk diet. He remained there for four months; the diarrhoea was checked in some degree, but returned whenever an increase in diet was attempted. For two months he lived on milk and strawberries and thinks he benefited at first, but a relapse came on while this diet was being continued.
New Treatment.—On May 11th he came to the Hospital for Tropical Diseases, and, by the kindness of Dr. P. Manson-Bahr, I saw him. He started the calcium lactate and parathyroid treatment on May 13th. The symptoms were typical—a sore and tender mouth and tongue, acidity, flatulence, large, pale pultaceous stools. Within a week the diarrhoea ceased, the motions were formed, and the colour brownish. In a fortnight he was taking eggs, toast, Mellin’s biscuits, milk puddings, baked apples, and bananas. Progress was uninterrupted, and he left hospital in June, having put on over a stone in weight. He went to stay at a hotel in Tunbridge Wells, and in September wrote to me saying that, as directed, he had gradually reduced the medicine and stopped taking it four weeks after leaving hospital, and had not had to return to it. "My diet," he writes, "has been just the same as that of everybody else in the hotel . . . It seems to suit me quite well . . . My weight has increased by another 4 lb., and I feel well." After five weeks in hospital he has apparently recovered from a disease which has troubled him for over 14 years.

Case 4.—Male, aged 21. Contracted sprue in India; in July, 1922, at Bombay, he suffered from diarrhoea with large, pale, porridge-like stools, indigestion, acidity and flatulence, and a raw tongue. This continued; he went to Simla in March, 1923, having then four or five of these motions daily. Emetine injections were given without producing any benefit.

New Treatment.—He was invalided to England, arriving June 7th. On admission to a nursing home he showed: Tongue raw, red and tender, fungiform papillae prominent, abdomen distended, especially the lower part; he was passing very large stools (20-30 oz.), pale, frothy, and loose. Weight on June 19th, 111 lb. He started calcium and parathyroid treatment on June 12th. By the 21st the soreness of the tongue had disappeared, and there were no dyspeptic symptoms after the 24th; by the 26th the stools were light brown in colour, only one a day, and the weight of them varied between 6 and 13 oz. He expressed himself as feeling very much better generally. At the end of the month he was well enough to go out for walks daily. His weight in successive weeks from June 26th to July 23rd, when he left the nursing home, was 112, 113, 118, 122½, and 128 lb. He ceased taking the medicine a fortnight later, and reported two months afterwards; he then looked and said that he felt thoroughly well; he was taking full diet, his weight was 154 lb., and he is about to return to India.

I have notes of six other cases, but to record them in detail would be practically a repetition of the above. The following case, however, ought not to be omitted as a set-off against the almost uniform success obtained in cases treated up to the present. This patient was in extremis when first seen, and the treatment was tried solely to satisfy the heart-rending request of the patient’s husband that "something might be done, as she seemed to be
dying." Even here an unexpected temporary improvement followed:—

**Case 5.**—Female, aged about 50. Had suffered from sprue for many years; was in hospital on that account five years ago and improved, but relapsed very soon afterwards and had never been well since. Normal weight about 126 lb. When seen on April 14th she said she felt very weak, and her weight was only 79 lb.; her mouth was very sore, there were several aphthae, and she was taking hardly any nourishment at all because of pain and weakness. She was intensely anaemic and very short of breath. She was passing five to six motions daily, pale, bulky, pultaceous, and frothy.

**New Treatment.**—She was at once put on the calcium and parathyroid, and a week later expressed herself as feeling "better in herself" than she had done for many months; stools three daily, less bulky, some formed, becoming darker in colour, not frothy; the flatulence was much less troublesome, and the ulcers in the mouth had cleared. In another week the stools were reduced to two or three daily and were more formed. Although she said she felt better and would like to get up, she was too weak and was obviously losing strength. Her weight on April 28th was only 73 lb. She became progressively weaker and unable to take nourishment, and died a few days later.

**Remarks.**

The average stay in hospital of the cases recorded above has been five to six weeks, and none so far have relapsed. The intervals since cessation of treatment vary between two and eight months. This is in marked contrast with the usual histories of as many months in hospital as weeks in the above cases, succeeded by a prolonged period of restricted diet and a constant tendency to return of symptoms, if not, as in many cases, an actual relapse.

The theory, as stated in my preliminary communication referred to above, is this: In the endemic areas of the disease conditions are such that there is an excessive proteid diet (in India, Ceylon, and other parts of the East), or a diet containing an excess of fat largely contributed to by the method of cooking the food (in China and the West Indies). Excess of proteids stimulates over-production of acid in the gastric juice and may lead to habitual over-acidity. The entrance of acid into the duodenum stimulates the production of secretin, which in turn leads to over-stimulation of the pancreas, and, secondly, to an upset in the balance of other endocrine glands, among them the parathyroids and salivary glands. Evidence is accumulating that endocrine disturbance and
Treatment of Sprue.

alimentary toxæmia are frequently associated, and all acute and chronic toxæmias react in some degree on the parathyroids, causing disturbance of calcium metabolism and a consequent decrease in tissue resistance, a vicious circle being thus set up. It will be of interest to speak of a few of the chief questions here raised in a little more detail.

1. Evidence of Over-stimulation of the Pancreas.—In the faeces the ratio of neutral fats to fatty acids is normally as 1 is to 2. In cases of pancreatic disease and insufficiency this relation is more than reversed and may be as high as 15 to 1. In conditions of increase of pancreatic action one would expect a greater splitting up of neutral fats and the proportion of these to fatty acids would be less. Now, in a mild case of sprue, the proportion is found to be as 1 : 3 or 1 : 4; in a moderately severe case as 1 : 4 or 1 : 5, and in graver cases even up to 1 : 9. Confirmation is also obtained clinically. In several instances, as improvement took place, the nutriment was increased by the addition of pancreatised food with the idea that this would help digestion and enable the patients to put on weight. Within a very short time—in some at least, especially in those with hyperchlorhydria—symptoms reappeared, and such patients have again and again stated that they wished to go back to milk as they felt worse after each meal of this food. Again, the work of others has shown that the internal secretion of the pancreas reacts on other endocrine glands and on the salivary glands. I suggest that the sore and aphthous condition of the tongue and mouth may in part be due to altered salivary secretion, for the reaction of this in severe cases is acid to litmus. The glossitis and stomatitis are also ascribable to alimentary toxæmia (see below). In Case 1 it was a notable feature that a bout of excessive acidity preceded an aggravation of the mouth condition, and a fresh crop of sore spots would appear within 48 hours.

2. Evidence of Errors in Calcium Metabolism.—This term is preferable to "calcium deficiency," because in the majority of cases in which blood-calcium estimations were carried out the total calcium content was approximately normal. Decrease of calcium, as the researches of Vines have shown, may be of two types: It may be absolute when the total amount in the serum is lessened, or it may be relative when the total is unchanged but some of the calcium is bound, so that the complex formed is not assimilable by
the tissues. In either case the effect on the somatic cells is the same; they suffer from a deficiency of calcium which they can utilise. The "ionic" calcium of the blood becomes deficient in cases where chronic toxaemia is present, and this is what, in my belief, occurs in sprue. The striking factor common to the tetany, cramps, oedema (in severe cases), the loss of weight, excess of excretion of calcium salts in the faeces, the ulcerative condition of the alimentary tract is their relation to deficiency or faulty metabolism of calcium. As stated, the total calcium proved normal or nearly so in the cases tested, and the coagulation time is not extended, so that the probability is (further tests are to be carried out to confirm this) that there is a change in the normal relations of the "ionic" calcium to the "coagulative" or "combined." When calcium is administered in sprue the increase makes up temporarily for the deficiency and the symptoms improve, but it was found repeatedly that this improvement was transient, and the dose had to be increased. The total calcium of the blood being about normal, one naturally inferred that it was the regulation of the calcium which was disordered; accordingly, the dose prescribed was reduced, but parathyroid extract was given at the same time, with the results detailed. The parathyroids have two functions, (1) detoxication, and (2) control of calcium metabolism; but these cannot be rigidly separated. The action of parathyroid substance is physiological and is not apparently specific against any one organism or toxin. "Its action is to place the tissues of the patient under conditions more suitable for the performance of their normal functions and for combating the effects of toxic processes"; also "when there are lesions due to such (toxic) states healing does not commence until the ionic calcium of the blood approximates the normal figure" (Vines). Hence, the rationale of the treatment above—bed, on a diet of milk (partly because of the ulceration, partly because of the calcium content), and the administration of calcium and parathyroid until the mouth ulcers are healed, when one may infer that the intestinal ulcers are on the mend also, and an increase in diet is then allowed. It is essential that the parathyroid should be guaranteed. The antagonism between thyroid and parathyroid is well exemplified in this disease. If an impure product is used the symptoms return almost at once.

3. Evidence of Alimentary Toxaemia.—This condition is practically self-evident. The acidity, the flatulence, the secondary
Treatment of Sprue.

anaemia, sometimes of severe degree, and the ulcerative state are all indicative of this. Further, the bacterial examination of the faeces reveals unusual organisms, monilia in one case, special forms of streptococci in another, aberrant coliform bacilli in a third. Such toxæmic conditions react, as Vines has shown, on the parathyroids. Possibly the special organism isolated constituted, as it were, the last straw which broke down the function of the over-worked parathyroid, and hence the benefit reported by some from the injection of autogenous vaccines in sprue cases (see below).

A few words may be written relative to the modes of treatment chiefly in vogue at present.

(a) Milk.—This, as already stated, constitutes a non-irritating food, allows the ulcers to heal, and is a good method of administering calcium. During the first fortnight or so it is practically the only food under the form of treatment indicated in the present paper, and nothing further need be said.

(b) Salisbury Treatment.—This diet, consisting of scraped meat and hot water, would probably act best in cases associated with hypochlorhydria, as by a radical alteration of diet it may bring about a change in the intestinal flora and so remove the source of the toxæmia. The régime is persisted in for six weeks or so, and then an increase of diet is very cautiously permitted with warnings to return to it at the first sign of recurrence of symptoms. Cure is rarely prolonged.

(c) Emetine Injections.—Emetine was probably given primarily because many cases give a history of previous dysentery. Its action as regards sprue in those cases which have come within my cognisance has been nil.

(d) Liver Soup.—This is perhaps given on the erroneous idea that, because the stools are pale, bile is absent and the liver is not acting; the prescription is analogous to that of ovarian extract for sterility, and similar barbaric empiricisms. Some writers, it is true, report good results, but we must bear in mind the fact that it is usually given with milk and other nutriment, while no reason has been given for ascribing any specific beneficial effects to the soup.

(e) Vaccines.—These, as has been pointed out, probably prove beneficial (in the rare instances in which they do so) by putting out of action the chief organism responsible for the toxæmia and so relieving the overworked detoxicating function of the para-
This gland is again enabled to cope with its work, but the effect of vaccines is uncertain and relapses are common. Thus may be explained the fact that the vaccines employed and found beneficial are so varied, one finding a streptococcus of some sort, another a monilia, a third some form of *Bacillus coli*. Those of the above-recorded cases who had had vaccines derived no benefit at all; moreover, these organisms are probably only subsidiary, because nearly all the above cleared up without the use of any vaccine, with great rapidity, as the histories show, and so far there have been no relapses.

(f) *Strawberry Cure*, and (g) *Santonin.*—These are given empirically. I know of no rational explanation of their actions. They are never employed alone, so it is difficult to say, in fact it is merely a matter of conjecture, as to what degree the amelioration, if it occurs, is ascribable to the fruit or the drug.

Finally, though the clinical results have been so fortunate, there are several questions as to the pathogeny of the disease still calling for elucidation. Such, for example, as:

1. Why does not the disease occur in Europe? Possibly it does.* Pellagra was for a long time overlooked in this country. All of the cases of undoubted sprue which I, personally, have seen have resided abroad, though some had returned from the tropics several years prior to the onset of symptoms. But the condition spoken of as *coeliac diarrhoea* bears a strong resemblance to sprue—the loss of weight, the bulky, pale, frothy stools, the flatulence, and *dyspepsia*. One patient who had suffered for months in this way was put upon the same line of treatment as that indicated above and told to report again later. She, however, sent word to say that the symptoms had cleared up in less than a fortnight, and that she felt well, but would come again should the symptoms recur. Several months have elapsed, but there has been no recurrence.

2. Why are no cases reported from Africa? Whether the disease is really unknown in Africa I am not able to say, but none have come to my knowledge.

3. What changes take place, or fail to take place, in the bile to bring about the pale colour of the stools? It was formerly believed that this was due to absence of bile, but chemical

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*Van der Scheer states that it does occur in Holland and Germany.*
examination shows that bile is not absent but is present as leucourobilin, and the gall-bladder contains normal-coloured bile.

4. Are there two distinct classes of sprue? As already mentioned, cases arising in India and some other parts of the East are often associated with an excess of proteid diet and hyperchlorhydria; these are the patients who complain most of a recurrence of symptoms when given food with liquor pancreaticus. Others develop on a fatty diet with organic hyperacidity and hypochlorhydria. Both suffer from dyspeptic and toxæmic symptoms, and so both do well on the calcium and parathyroid treatment, but the latter can take pancreatised food, sometimes at least, and it would appear, therefore, that in both there is intestinal toxæmia with upset of calcium metabolism and parathryroid function, but that in the former there is in addition the endocrine disturbance secondary to pancreatic over-stimulation. If organic acids (and not merely inorganic, as hydrochloric acid) can also bring about excessive production of secretin on entering the duodenum, then this difference vanishes.

It will be of interest to know whether similar felicitous results can be obtained when the treatment is carried out on patients in countries where the disease is endemic.

References.

Hygiene in the Far East.—The Committee on Hygiene of the League of Nations, at its recent session at Geneva, discussed questions pertaining to the sanitary administration of the Far East. It recommended the creation of a bureau of epidemiologic information in some port to be designated by agreement between the governments concerned. It recommended that the report of the commission of inquiry, containing the draft of a sanitary convention between these countries, be transmitted to the governments of the Far East.
OBSERVATIONS ON KEROSENE AS A DELLOUSING AGENT.

S. D. Joffick, M.D., Director of the Clinical Diagnosis Institute, Shanghai.

In April, 1921, while engaged in the Famine Relief Work of the American Red Cross I had occasion to carry on the delousing of coolies (famine sufferers) on a large scale. The billets were disinfected by coal tar solution (3.5 per cent). The bedding was put in the sun and sprayed with kerosene. The clothing was ironed. The coolies themselves were given a kerosene bath. Their clothing was frequently also treated with kerosene. This was the routine used for disinfection.

I was not altogether satisfied with kerosene as a delousing agent. Much trouble was experienced with the coolies, who objected strongly to it. Often they feared it. There were rumours abroad that many of their fellow coolies had died from a bath of kerosene. I tried to convince them of the safety of the procedure by bathing myself in kerosene. When example did not help, I found that many consented to take the bath when they were told that we were using a drug which had only the smell of kerosene. In spite of this assurance several gangs left the work, refusing to undergo this method of disinfection. There was also the objection that living vermin were sometimes found on the bodies of the coolies who had just been disinfected by kerosene. Evidently further investigations were necessary, so in 1922, while carrying out experiments with steam disinfection, certain additional experiments with kerosene were also undertaken. The experiments were done in the way used to disinfect clothes, bedding, and men, described in a previous paper (China Medical Journal, January, 1923.)

Experiment No. 1.

1. On a Chinese shirt, hung on a clothes line, thirty lice were placed in various parts, including the seams. For these experiments only such lice were used as were strong enough to turn over when placed on their backs.

2. Kerosene was sprayed on all parts of the shirt, including the seams.

Result: The lice walked freely for several hours; some of them fell off the shirt, but when placed in an open bottle recovered after two or three hours.
Kerosene as a Delousing Agent.

Experiment No. 2.

Thirty lice were placed on a blanket and three to five drops of kerosene were dropped on each.

Result: The lice walked about for nine or ten minutes (the smaller ones for five to six minutes), after which time their movements became slower; after five or six minutes more, the lice stopped their movements entirely and were apparently dead. The lice were then placed in an open bottle and examined frequently during a period of 20 hours. At the end of this time eighteen had recovered and twelve were dead. Three hours later the surviving eighteen were fed. Four of them first turned pink, then red, and died from overfeeding. The remaining 14 were fed by the box method and began to lay eggs (nits), but only after three to four days.

Experiment No. 2 was repeated several times. In one experiment with 180 lice, no less than 103 recovered, and 59 of them laid nits, but not until three to four days afterwards.

In view of such unexpected results it was necessary to determine how long a louse could be immersed in kerosene without being killed by it. Therefore the following experiment was performed.

Experiment No. 3.

One hundred lice were divided into groups of twenty and immersed for periods varying from one or two to five minutes in American kerosene "Socony". After this they were placed on blotting paper to remove completely the kerosene remaining on the body and placed in an open bottle. This experiment was performed with female lice only.

Result: 1. After one to two minutes' immersion, out of the groups totalling 100 lice, 86 recovered, and 72 of these laid eggs after being fed.

2. After three minutes immersion, out of a similar number 42 recovered, and 11 of these laid eggs after being fed.

3. After four minutes immersion, 8 seemed to recover, but soon died.

4. After five minutes immersion, none recovered.

Discussion.

Kerosene as a delousing agent has been known to the medical profession for a long time. But after the large experience gained
The China Medical Journal.

during the Great War, when it was found that lice were the
conveying agents of typhus, relapsing fever and trench fever, all
delousing methods were carefully reviewed. Many were discarded
because they were found to have no real value. On the value of
kerosene as an insecticide not all authors agree. Paul and
Castellani and Jackson assert that kerosene destroys lice almost
instantly. The above experiments show very clearly that lice even
after being covered with five drops of kerosene were not all killed
by it. Some had died, but others were still able to walk, and after
twenty hours some of those recovered which had been immobilized
by the kerosene. The experiments of Castellani and Jackson were
done by placing lice in a closed box, where the vapour of the
kerosene could be held for a long time. In carrying out disinfection
in practice the vapour is not contained in a closed space; therefore
I believe its killing power is diminished. According to Strong,'
"the very extensive practical use to which petroleum was put in
Serbia in connection with delousing enormous number of people has
shown it to be a very satisfactory disinfectant in connection with
an epidemic of typhus". The successful combating of the Serbian
typhus can be accounted for by the other preventive measures taken
by Strong and his co-workers, such as "general house-to-house
inspection and disinfection, the establishment of quarantine and
bathing throughout the country, cleaning and disinfeestation of
public vehicles, cabs and railway stations, a campaign of education
with printing and distribution of circulars in the Serbian language
regarding the nature of the disease, the manner of its spread, and
the precautions to be taken to avoid infection," the establishment
of sanitary trains with a steam disinfection car for clothing and a
bathing car, permanent bathing and disinfecting plants in villages,
the spray of kerosene being used only after a good bath. The
success of combating the epidemic may be, and I believe was, due
to the other drastic measures, and does not show the effectiveness of
kerosene as a disinfecter. Barrie recommends the daily anointing
of the entire body with kerosene "thick enough to be seen;"
wearing "boots, not shoes, which are wet daily with kerosene;"
applying the same to the openings in the coat sleeves of garments;
and if obliged to sleep in the daily clothes (as is often the case with
Chinese), making "a liberal night application of kerosene." All
this is impossible to carry out with the average Chinese. Even if
nothing else is tried than the wetting of the body with kerosene,
Kerosene as a Delousing Agent.

this is difficult to enforce, as mentioned at the beginning of the present paper. This whole method may be dangerous to some persons, because the "chemical composition of commercial petroleum varies and idiosyncrasy must be taken into account." Further, the inflammability of kerosene makes such a method absolutely impracticable. Nuttal is of the opinion that "petroleum quickly immobilized lice; it does not kill them 'almost immediately,' as Castellani and Jackson assert. Body lice when immersed in kerosene were killed in 1½ minutes (in the present author's experiments in 4 minutes); nits survived 20 minutes; the vapour had no effect on nits in 15 minutes. Lice were killed in 24 hours." Bacot and Lloyd using kerosene as supplied at retail shops, immersed lice for 5 minutes at 20° C. "Most of the lice made active movements while immersed, and one or two made slight movements immediately after removal." As an explanation of the experiments just mentioned, Bacot says that "lice are not passive, but active factors in process of immersion, protecting themselves against the entrance of fluids by closing the spiracles." If the period of immersion is short, no penetration occurs; but when it is prolonged, or the temperature is too high, the need for oxygen leads to attempted breathing and the fluid finds entrance through the tracheal passages, killing the louse. In the case of nits, the question of penetration "seems rather to be a matter of surface tension due to the nature and temperature of the fluid."

As is well known, petroleum belongs to the saturated hydrocarbons, containing 5-16 atoms of carbon. At ordinary temperature it is a liquid. The American petroleum, as well as the other kinds, is made by fractional distillation and contains hydrocarbons with boiling points from 50° C. to 150° C. In order to find out the insecticidal power of kerosene, Hailer performed experiments with its principal fractions having the above-mentioned boiling points. His experiments were as follows:

1. He placed three drops of hydrocarbons with a boiling point of 50° C.—60° C. (petrol ether) in a closed bottle of 40 c.c. space. Lice previously placed inside were not even immobilized. After adding a few more drops the lice were immobilized, but recovered after three hours even when the bottle was closed.

2. Two drops of hydrocarbons with a boiling point of 80° C.—90° C. caused immobilization, but the lice recovered after
24 hours even in a closed bottle. Lice which were placed in a mixture of two drops of such hydrocarbons with air for one hour were immobilized for more than three hours, after which time they recovered.

3. Two or three drops of hydrocarbons with a boiling point of 90° C.—120° C. in air space of 40 c.c. killed the lice after five minutes, but in a closed bottle only. The same results were obtained with hydrocarbons of a boiling point of 100° C.—150° C. To the same space, one to three drops of the same hydrocarbons were added and the bottles were kept closed for 24 hours. At the end of this time lice were placed in the bottles. Under these conditions such hydrocarbons showed no insecticidal power at all. This was due to the evaporation of these compounds, even in a closed space. For this reason, Hailer recommends the use of kerosene as an insecticide for clothing in a closed space only, when we can be sure of the equal distribution of the vapour. "There is no question of the use of petroleum for treatment of the person because of the very quick dissipation of its action due to its evaporation."

As was shown in the first part of the paper, the experiments carried out confirm those which were performed by the authors just mentioned.

CONCLUSIONS.

1. Kerosene very often immobilizes, but does not always kill lice.

2. Kerosene used as an insecticide for clothes is effective only in a closed space where its evaporation is prevented.

3. Methods recommending a spray or even a complete anointing of the body are not safe, and in no case should they be applied as the single method of disinfestation.

REFERENCES.

RESULT OF DELAY OF TREATMENT OF CANCER.

Five hundred and thirty-nine cases were studied by Simmond and Daland. The average duration of the disease from the time it was first noticed until the patient was admitted into the hospital was 11.6 months. The delay on the part of the patient from the time the disease was first noticed until the first consultation with a physician was 4.6 months. The average delay from the first consultation to the time operation was advised was 2.9 months. In ninety-seven cases of carcinoma of the breast it was 1.8 months. Fourteen per cent of all patients, and fifteen per cent of the carcinoma of the breast patients are known to have received poor advice from the first physician consulted. The average delay on the part of the patient from the time operation was advised until entrance into the hospital was one month. Only 43.6 per cent of the cases admitted to the hospital were considered suitable for an attempt at cure by radical operation. The operative mortality in cases in which a laparotomy was performed was 34.6 per cent. Sepsis in some form was the most frequent post-operative complication and caused 47 per cent of the deaths. The authors point out that from this study it would appear that the mortality from cancer is high and the percentage of cures relatively small; much smaller, in fact, than one is led to believe from reading the report of a series of cases. They urge that more be done to educate the public to consult a competent physician for any suspicious tumour, ulcer or other symptom, and to educate a certain group of practitioners to insist on immediate appropriate treatment in any suspicious cases. The figures suggest that the educational campaign in regard to cancer carried on during the last few years has had more effect on the laity than on the general practitioner.

SYPHILITIC DISEASE OF THE LIVER.

Four cases described by D'Arbela illustrate the remarkable variety of the clinical pictures that may be presented by syphilis of the liver. In one woman continuous fever with daily remissions and intense prostration, jaundice, ascites and signs of partial obstruction of the bile duct prevented a diagnosis at first, although the free effusion and the enlargement of the spleen and liver might have suggested cirrhosis of the liver. In this case headache, worse at night, had been noted for nearly two years. In the second case the symptoms were all digestive except that the abdomen enlarged until advanced pregnancy was assumed. Complete recovery
followed tapping and forty mercurial inunctions. The diagnosis in the third case had been in turn Malta fever, malaria, tuberculosis and angiocholitis during the four years of symptoms, but a clinical cure was realized at last with mercury. In the fourth case an eruption accompanied the digestive and liver disturbances, and they all yielded to prompt mercurial treatment.

LABORATORY DIAGNOSIS OF SMALL-POX.


1. In slight epidemics of small-pox, clinical observation is not sufficient to warrant the early discovery of first cases with all the reliability which is absolutely necessary for sanitary measures. Because the etiological methods are not yet available, experiments were made to see if by laboratory methods a higher degree of sanitary efficiency might be obtained.

2. After the experience of three years' work in a small-pox epidemic two methods are recommended which seem to fulfil all the requirements of practical service.

3. The inoculation of the cornea of the rabbit gave a simple method of making the diagnosis of small-pox from the positive result, which is to be expected in the great majority of small-pox cases. A negative result in a suspicious case does not absolutely exclude the diagnosis of small-pox.

4. The study of the blood of the patient—white count and differential count—gave an especially simple and reliable method, which, from the characteristic and regular changes, permits the making of a diagnosis of small-pox, and especially a differential diagnosis from chicken-pox. If the typical changes are missing, this will exclude the two diseases with the highest degree of probability.

5. The two methods are so simple and practical that they seem indispensable for the sanitary service and should be required in every suspicious case. In suspicious cases a definite and early diagnosis is possible immediately, or in one or two days. On no condition can small-pox be excluded without having applied these methods.

THE BLOOD IN SMALL-POX AND CHICKEN POX.


Blood studies were undertaken by Hoffmann in sixty cases of variola and forty cases of varicella. The differential count in both diseases revealed pronounced but identical changes, characterized by high lymphocytosis with a corresponding reduction of the number of polymorphonuclears, high increase of eosinophils, presence of myelocytes, changes in the Arneth Index. Those
changes show a distinction from other diseases with similar clinical symptoms. For the differential diagnosis of the two diseases it is decisive, that in variola the number of the leucocytes is regularly highly increased for weeks, whereas in varicella there are normal numbers or only a slight increase from the eighth to the tenth day. If in a clinically suspicious affection the typical blood changes are missing, the diagnosis of varicella or variola can be excluded with a fair degree of safety. The changes are marked in variola for forty days and in varicella for twenty days at least. The degenerative changes in the red blood-cells and the hemoglobin, though present, are slight, and of no great specific importance, especially in the tropics.

**TRANSMISSION OF LEPROSY.**


Investigation has led to the belief that healthy human beings living in a healthy climate and sanitary surroundings do not develop leprosy, even when inoculated with it. This conviction has been strengthened by several cases which Muir has seen. The habits of lepers and of those who come in contact with lepers are largely responsible for transmission, especially in house and bed infections; and a hot, moist climate, by leading to scanty protection of the skin by clothing and to irritation of the skin by insects and skin diseases, promotes auto-inoculation. The degree of body resistance is most important and tends to be higher in temperate, healthy climates and in natural sanitary surroundings. It is lowered by concurrent or intercurrent diseases, constipation, unsuitable diet, pregnancy and many other causes, and it is commonly in connection with one of these predisposing or exciting causes that leprosy first shows itself. Improvement in sanitation, the introduction of dairy farms and market gardens and the development of individualism stamped leprosy out of England.

**RESULTS OF LEPROSY TREATMENT AT CULION.**


A total of 4,067 patients had received anti-leprosy treatment at Culion between July 1st, 1921, and September 30th, 1922. The time of treatment varied from fifteen months as a maximum to less than three months. A total of practically 56 per cent of the entire group, including those most recently put under treatment, are reported as improved, while 36 per cent are stationary. The most favourable groups, taking the various influencing factors into consideration, are: females, the young, those recently infected, those who can tolerate large doses, those who can and do take the treatment regularly, and those who do not develop reactions or serious complications.
RELIABILITY OF POST-TREATMENT DIAGNOSIS OF HELMINTH INFECTIONS.


The toxic effect of anthelmintics on the ovulation of hookworms is generally believed to last for a period of ten days. Mhaskar, as the result of extensive experiments, has ascertained the period that must be allowed to elapse if a reliable diagnosis of hookworm and other helminth infections is to be made after treatment. His conclusions are as follows:

1. Betanaphthol, thymol, carbon tetrachloride, and santonin have a fleeting toxic effect, lasting for three days, on the ovulation of hookworms and roundworms.

2. Oil of chenopodium is more toxic to these worms, and its effect is evident up to the twelfth day of treatment.

3. None of these drugs in the customary doses are toxic to whipworms.

4. The diagnosis of hookworm, roundworm and whipworm infections can be reliably carried on after the fourth day in the cases of betanaphthol, thymol, carbon tetrachloride, and santonin treatments. With oil of chenopodium, the diagnosis, to be reliable, should not be undertaken until the twelfth day after treatment.

PRE-OPERATIVE DIGITALIZATION FOR REDUCING POST-OPERATIVE SHOCK.


In post-operative shock there is a marked fall in pressure, and it seems rational to suppose that if the pressure lever can be maintained a large group of patients may be spared this complication, or at least that it may be distinctly lessened in gravity. It was with these theoretical considerations in view that Geist and Goldberger determined to try the value of some drug that would be a cardiac stimulant and would help maintain the blood and pulse pressure levels. Digitalis was selected. At the time of the publication of their original paper they used two methods, the slow and the rapid method. They have found that the slow method had certain advantages, namely, ease of administration and absence of the digitalis nausea and vomiting, and for these reasons, of the hundred cases of the second series all but eight were digitalized by the slow method. In the slow method, digitan tablets, 1½ grains (0.1 gm.) each, were used instead of the standardized tincture of digitalis. One tablet of digitan per 15 pounds of body weight is the total amount. The first dose is given twenty-four hours before operation, and then every two hours until the entire amount is taken. On the morning of operation two more such doses at two hour intervals are given, and occasionally twelve or twenty-four hours after operation another dose can be administered. The digitaliza-
tion effects last from ten to fourteen days, so that if operation is deferred a few days patients should not be digitalized. Aside from the improved subjective symptoms and the general better impression of the post-operative convalescence, the pulmonary complications were definitely lessened from 15 per cent in the non-digitalized cases to 0 per cent in the digitalized cases. In a series of 100 cases, there were 3 per cent complications, an improvement over the reported percentage by others ranging from 8 to 27 per cent in non-digitalized cases.

**MILK INJECTIONS IN EYE DISEASES.**


Stevenson believes that sterilized milk is one of the most useful analgesics. Generally the initial dose is 3 c.c. Later the dose is doubled. This can be given at least three times a week. Milk injections do not cure trachoma cases, but they do relieve the corneal irritation and lessen secretion. Photophobia is a symptom which will often markedly lessen under milk injections. Vitreous opacities and turbidity of the aqueous and cornea will clear. It gives great relief in the early irritation of interstitial keratitis.

**SMOKE PRODUCTION AS A MEASURE OF MOSQUITO CONTROL.**


The principle of this measure against mosquitoes in stables, rooms, etc. is to fill the place with smoke quickly in order to drive them out of the corners and then to attract them to one area of light and air where they can be destroyed. The room to be smoked should have all entrances of light and air except one eliminated. The door should be covered with a white sheet made as taut as possible. A pile of dry straw should be lighted and then covered with damp straw or manure. In the case of wooden floors or a tent the smoke may be generated in a tin pan. It should be made simultaneously in the centre and in two or more corners. When the smoke fills the place the mosquitoes fly to the sheet on the door, which is the only visible spot of light. When large numbers appear they should be killed promptly. In stables smoking can be carried out at any time, but in living rooms it should be done in the early morning.

**SULPHUR DIOXIDE TREATMENT OF WOUNDS AND ULCERS.**


In this paper a treatment is advocated which has hitherto been mainly confined to the sphere of the veterinary surgeon. It consists of applying an ointment or a liquid impregnated with
sulphur dioxide to wounds and ulcers and to whitlows and carbuncles after they have been incised. The author’s experience with this treatment covers a period of about a year, during which he has given it in about 60 cases. In no cases was any harm done, and in several marked improvement resulted; sluggish varicose ulcers which had persisted for years responded in a fortnight in a remarkable manner. The first effect of an application of powder impregnated with sulphur dioxide is a tingling, stinging sensation, which is not, however, worse than that associated with the application of tincture of iodine to a raw surface. The tissues respond at first by an increased discharge and become less sodden and swollen; the discharge, at first dirty brown, becomes a light yellow, the offensive smell and sloughs vanish, the surface of the wound becomes flatter, and there is a rapid growth of new epithelium. The sulphur dioxide is liberated as soon as the powder comes into contact with a wound or ulcer, and to prevent the gas escaping too soon the powder or liquid should be covered with a non-porous dressing such as some indifferent ointment.

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**CHAPARRO AMARGOSA IN AMEBIC DYSENTERY.**


Chaparro amargosa (meaning “bitter bush”), *Castela nicholsoni* Hook, is supposed to belong to the family Simarubacea. Chaparro amargosa is a small thorny bush indigenous to South-west Texas and Northern Mexico. All parts of the plant, from the root to the berry, possess the characteristic bitter taste and medicinal properties. Goldsmith and Greene do not believe that this drug should supplant ipecac and its alkaloid; however, there are certain cases which are rebellious to the usual treatment, and in these cases this drug should be given a trial. Six or eight ounces of the infusion are given by mouth, one-half hour before each meal; rectal enemas of from 500 to 2,000 c. c. of the infusion are given in the knee-chest posture twice daily, and the patient is instructed to retain the solution as long as possible. It is advisable to continue the treatment for a week or two after the subsidence of all symptoms. Chaparro amargosa seems to be specific for *Entameba histolytica*. It has no effect on other intestinal parasites, and also is not at all efficacious in other forms of dysentery.

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**CHLOROFORM ANESTHESIA FOR YOUNG CHILDREN.**


Roello’s research on the blood and urine of thirty-six children before and after chloroform anesthesia has confirmed our knowledge of the extreme tolerance of even young children for this anesthetic. The most appreciable effect is the drop in the hemoglobin percentage as the hemoglobin combines with the chloroform.
Book Reviews.


In this work on the diseases of the breast and their treatment, special attention is given to malignant tumors of the breast. In considering the etiology of carcinoma the author expresses the opinion that the parasitic theory of the origin of malignant diseases is the only one which can offer an adequate explanation of all the phenomena to which a malignant growth gives rise. The operations for the complete removal of all affected tissues are fully described. It is said that X-rays should never be employed in an attempt to treat a case of carcinoma of the breast in which a successful surgical operation is possible, though the rays may be employed after the removal of a tumor to prevent recurrence, in the attempt to remove a recurrent carcinoma, and in the treatment of inoperable cancer. It is held that radium, as at present used, cannot do much for malignant tumors of the breast, though it may sometimes be of use in assisting to remove recurrent nodules. Because of its importance the whole subject of malignant disease of the breast is treated very fully. The illustrations are numerous and instructive. The volume is commended to surgeons, as it gives a full account of the present state of our knowledge of the malformations, diseases and surgery of the breast.


The objective of this book is to present within reasonable space the most important features of the anatomy, etiology, symptoms, diagnosis and prognosis of the different forms of hernia, together with descriptions of the various surgical operations as performed by leading modern surgeons. The author indicates his own preferences. For inguinal hernia he performs the regular Bassini operation up to the point where the cord is transplanted, and then adopts a procedure of his own to reinforce the parts left weak by the Bassini operation and so do more to prevent recurrence. Much space has been devoted to the anatomy of hernia in order that the reader may have the material accessible, and make it unnecessary to search through the works devoted exclusively to anatomy. A brief historical sketch is incorporated in each of the more important chapters. The bibliography is very full and has been selected carefully. The work closes with a chapter on the Medico-Legal Aspects of Hernia. The illustrations, made especially for this work, are numerous and good. Surgeons will find the volume very useful as an immediate guide to diagnosis and treatment, and for reference to the literature of the subject.


The purpose of the authors is good, as they aim at comprising in one small volume all the more established modes of research in all the branches of clinical pathology which are otherwise only to be found by search in various expensive textbooks and books of reference. The size of the book
enables this information to be at the service of general practitioners and medical students, as well as laboratory workers. Wherever possible the interpretations of the results of the different tests, based on comparisons with the normal, are shortly stated in order that reports of pathological conditions may be translated into practical clinical information. The book contains an immense amount of accurate, practical information.

Publishers: Baillière, Tindall & Cox, 8, Henrietta St., Covent Garden, London. 1924.

This little book is written as an aid to the student who is presenting himself for examination, and who has already attended lessons and practical courses in experimental and chemical physiology and in histology. As the authors say, it cannot in any sense replace the physiological textbook, lectures or practical work. In this edition important additions have been made to the sections on the chemical regulation of respiration and the sympathetic nervous system. Students, and physicians who wish to review their physiological knowledge, will find the work very useful, as within its small limits the subject of physiology is covered with accuracy and clearness.


The sterilization of "measly" beef and pork is important not only to prevent loss to farmers, cattle-dealers and others, but to prevent infection of human beings. As the result of a very thorough investigation, the author states that "freezing at temperatures ranging from -5° C. to 18° C. for a period of about ten weeks appears to destroy the vitality of all the cysticerci in carcasses of beef and pork. For safety a margin should be allowed on this period of freezing, and it is suggested that at least a period of twelve weeks' freezing, of slightly infested beef or pork at a temperature of 14° F., that is, -10° C., should be undergone before the meat may be regarded as sterile, and the cysticerci as dead.


This number of "The Caduceus" opens with an instructive paper on dysentery, by J. Anderson, in which he records his original work on cellular exudates to find a rapid method of differential diagnosis between the different forms of this disease; the Surgical Unit furnishes notes on eighteen cases of epitheliotoma of the penis; Yue Man Kwong discourses on the post-mortem evidence of congenital syphilis in Hongkong; K. H. Digby, president of the Hongkong Society, presents his presidential address on Clinical Research, and surgical notes and various items of general interest complete the number. From two or three cryptic utterances we gather that "The Caduceus" is about to undergo a metamorphosis, passing from the stage of an informal journal, intended mainly for medical students to the severely scientific stage of the mature medical journal. We shall welcome the change and hope it will bring unalloyed joy to the editor.
C.M.M.A. South China Branch.

REPRINTS

Child Mortality with reference to the Higher Education of Parents.


Hospitals in Japan.— H. J. Howard, M.D., and W. J. Lennox, M.D. Modern Hospital, February, 1923.

C. M. M. A., SOUTH CHINA BRANCH.

A meeting of the South China Branch of the C.M.M.A. was held in the Canton Hospital, Canton on January 10th, 1924. Seventeen members were present.

It was reported that the committee appointed to investigate the deplorable condition existing among the sick and wounded soldiers in Canton had interviewed the Civil Governor, Secretary of War and the City Mayor. These officials had agreed to erect matsheds and give further aid for the relief of the soldiers. Thus far, however, nothing has been done.

Dr. Kirk reported that preliminary plans for the Scientific Programme of the 1925 Conference of the C.M.M.A. had been made. These plans were adopted. Drs. Cadbury, John Kirk, and P. J. Todd were appointed to serve as a Committee of Arrangements for the conference, to serve in connection with a similar committee appointed by the British Medical Association of Hongkong.

Dr. Oldt reported that the Kwangtung Christian Educational Association desired to have uniform records and forms prepared for the physical examination of school children. Drs. Cadbury and Oldt were appointed to prepare such forms for submission to the forthcoming conference.

It was also reported that Dr. W. W. Cort, of the School of Hygiene of Johns Hopkins University, was expected to arrive in Canton about February 13th, 1924, for a six weeks' campaign to
estimate the intensity and extent of hookworm infection in South China. Country hospitals were urged to send representatives to study his methods.

The Treasurer's report, which showed a cash balance on hand of $45.81, was approved.

The election of Officers for the ensuing year resulted as follows:

President: J. L. Harvey.
Vice-President: Wong Man.
Secretary-Treasurer: H. B. Turbott.
Chairman Programme Committee: P. J. Todd.
Chairman Health Committee: F. Oldt.

Dr. J. L. Harvey exhibited a number of excellent radiograms. Several members remained to examine interesting cases in the wards of the Canton Hospital.

J. Oscar Thomson,
Secretary.

ANATOMICAL AND ANTHROPOLOGICAL ASSOCIATION OF CHINA

The first meeting of the Anatomical and Anthropological Association of China of the year 1924 was held Friday afternoon, February 29th, 1924. The Association was addressed by Dr. C. U. Ariëns Kappers, the eminent anatomist and neurologist from Amsterdam, Holland, on the subject, "A Simian Feature of European, Indonesian, Philippine, and Chinese Brains". Owing to their interest in the speaker and his subject the members of the Biology Journal Club adjourned its meeting, originally scheduled for the same day and hour, and accepted the invitation of the Anatomical and Anthropological Association to make the occasion one of a joint meeting of the two societies.

The following is a brief abstract of Dr. Kappers' address:

A long time ago Huxley stated that the difference between the brain of monkeys and that of man was greater than the difference between the brains of monkeys and those of lower mammals. This idea was based chiefly on the supposed absence in man of a feature of the simian brain, which is very conspicuous and which has been
known for many years, namely, the so-called Simian Sulcus. The simian sulcus, according to Huxley, never occurred in the human brain. When Elliot Smith was working in Cairo he examined about 2,000 brains of Egyptian fellahs, and found that the simian sulcus does occur in the Egyptian fellah in a very striking way. When this paper appeared Dr. Kappers took up the study of Dutch brains to see if the simian sulcus occurred in these also, and he found that it did, certainly in about 15 to 20 per cent of the brains examined. Dr. Black has described one of these cases in one of his excellent papers in the "Journal of Comparative Neurology."

A very striking feature which Dr. Kappers noticed when he studied the brains of Chinese and Filipinos is that the simian sulcus is more conspicuous on the left than on the right hemisphere. In ten brains taken at random out of about thirty Chinese brains in the anatomical collection here in Peking, this feature was noticed. The same holds good for the brains of Filipinos which the Peking Union Medical College has received from Manila; the simian sulcus was found in a large percentage, although Dr. Kappers did not examine them all. In these also the sulcus was more conspicuous on the left side than on the right. Further, in the fifty Dutch brains which Dr. Kappers brought with him the simian sulcus was more conspicuous on the left side, but some of the right hemispheres showed it very plainly.

A simian sulcus is, therefore, a very constant feature in all the human brains Dr. Kappers has examined, though it is not as constant as in the simian. But this feature is not restricted to the primates. When the brains of lions and tigers are examined, traces of the simian sulcus are found, and this brings us on the way to explain the character of the sulcus. We may say that the simian sulcus is not restricted to the visual area, but that it goes higher up in man, and this also is seen in some carnivorous animals. If we examine the brains of these animals histologically this sulcus is found to be near the anterior limit of the striate area of the brain, or the visual projection area. If we examine the brain of Atelcs we find the same thing. It is indeed a striking fact that the simian feature in man bears the character shown in Atelcs and not in the higher anthropoid monkeys. After all, this is not so strange if we consider the position of man's central and relatively undifferentiated position in the line of evolution.
From June 1st, 1924, the Association’s offices will be in the Missions Buildings, Yuen Ming Yuen Road, and all communications should be addressed there. For letters by post, however, we keep our postal box No. 1121, so that for these there will be no change.

The Missions Buildings have been put up especially on behalf of the National Christian Council, and the offices of most of the Mission Bodies in Shanghai will be located in this building, which will be a very great advantage in the matter of intercommunication, a very important point in an interdenominational association such as the China Medical Missionary Association.

We trust that the members of the Association will take the first opportunity that they can to visit the new offices, that we may ourselves have the pleasure of getting to know them better and that they may learn accurately our new location. The Buildings are situated immediately behind the British Consulate.

In addition to the Secretary’s and Editor’s offices, we are securing an extra room for the use of the members when visiting Shanghai, and we trust that full use will be made of this. We are proposing to fit the room up as a library and writing room, and hope that the members will find this of real value for any work that they want to do in Shanghai. It is our aim to supply them here with all that we can in the way of Journals and books of reference that will allow members to complete any investigations in which they are interested or to refresh their memories on practical points of treatment.

We should like to gather here lists and samples of materials that might be of help to physicians fitting out their hospitals, and sample plans of buildings, but such will of course take some time to collect.

It would be of considerable interest if we could gradually get together a collection of books and pamphlets dealing with the early history of medicine and of medical missions in China, and we would appeal at once for any gifts that might help to form a basis of such a collection.

For the first year at least the rent of this room has very kindly been provided by a few friends in England.

The Secretary would again remind the members that many of them are still behind with the dues for the current year; he will be glad to receive these at an early date. It adds considerably to the work of the office and is an added expense to the Association when personal notices have to be sent out, so please remit without undue delay.
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.

Cancer in China

The following correspondence appeared in the British Medical Journal, January 19, 1924.

Sir:—As throwing light on the etiology of cancer, all information on its occurrence in foreign countries is welcome. I therefore do not apologize for asking you to be good enough to publish the following summary of his observations, which I have received from my nephew, Dr. S. G. Peill, of the London Missionary Society, Tsangchow, North China.

"Carcinoma of the breast is very common, also of the cervix, etc. Next comes cancer of the oesophagus—though I have never had an opportunity to publish the following summary of his observations, which I have received from my nephew, Dr. S. G. Peill, of the London Missionary Society, Tsangchow, North China.

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This is all the information I have been able to obtain, and it does not much help those of us who are searching for some connection between cancer and the habits of civilized life. The hospital at Tsangchow is in the midst of a large city population, though it also serves a wide agricultural district. The patients are drawn from all classes, rich and poor. Obviously the poorer Chinese are not likely to indulge much in eating pork or smoking tobacco. We need further and more detailed observations as to cancer and habits of life in all countries whose civilization differs markedly from our own.

I am, etc.,

Sidney Davids.

P.U.M.C., Pathological Laboratory: Free Examination of Specimens.

It is desired to draw the attention of missionary physicians in China to the work of the Department of Pathology of the Peking Union Medical College, as it is of great value to all. It sometimes happens that we are uncertain in our diagnosis and are hindered from reporting highly interesting cases (the editor is writing) because unable to confirm the tentative diagnosis by microscopic examination of the diseased tissues. This may be owing to lack of time, necessary facilities, and perhaps occasionally lack of technical knowledge and skill. The Department of the P.U.M.C. will do this work for us free of charge and furnish the diagnosis. Further, the material sent will be kept in the Peking museum for the benefit of medical students and research workers. The following circular letter has been received recently from Dr. Ralph G. Mills, of Peking:

Dear Doctor:—There is reason to believe that many of the circular letters sent out two years ago from the Central Pathological Laboratory of this institution failed to reach their destination. May we, therefore, draw your attention to the enclosed letter and to the advantages...
which its contents may bring to your hospital. Accuracy and rapidity of diagnosis may mean a great deal to your patients, and assist you in holding the confidence of your clientele. This service is extended to you free of charge, but with the earnest request that you make the material you send as useful to others as possible. We hope that many doctors in the Orient will avail themselves of the opportunity of studying series of specimens, and those who do so will thank you for any care you exercise in sending clinical notes with your specimens.

Attention has been drawn to the acidity of the formalin obtainable in the Orient and the injurious effects which free acid may have on certain delicate specimens. This can be counteracted by adding a little powdered calcium carbonate or sodium bicarbonate to the formalin before specimens are placed in it. Very large masses of tissue, or those in which large areas of skin would prevent the entrance of the fixing fluid to the inner portions, might be cut a little to assist in preservation.

As indicated in the previous letter, the Service is prepared to pay the overhead expenses on gross material sent here, provided a bill of the same is presented by the sender. It is, of course, expected that the cost of telegraphic diagnosis will be paid by the recipient. The commoner sorts of specimens are not so desirable as those in which a diagnosis is uncertain, or where special interest centres in the material. This applies especially to long-distance shipments, but tumors of the malignant or unusual sorts are greatly desired.

Hoping to extend to you the service rendered acceptably to many practising physicians in the East,

I remain,

Yours respectfully,

Ralph G. Mills.

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NEWS AND COMMENT.

Mission Hospital Looted in Szechuan.—At Tungchuan, Szechuan, on January 28, 1924, the Men's Hospital of the Friends' Foreign Mission was looted. The cause was that a great enemy of the 21st Division, a Colonel Dai of the 1st, was there mortally wounded. His enemies in revenge looted all the wounded soldiers, and also stole about $100 worth of goods from the hospital stores, besides an even larger amount from the house of the nurses.

Red Cross Conference.—An invitation to hold the next International Red Cross Conference in Japan will be presented to this year's conference by the Japanese delegation, the personnel of which has now been announced.

Canton Hospital Aided by Provincial Government.—The Government has presented to the Canton Hospital a splendidly located site of 127 mow in area. The hills dominate the country around, the ground can be readily graded, it is very close to and overlooks the river, and is about half a mile from the station on the Canton-Hankow Railway, nearest to the Canton terminus. A new motor road, which will pass the new site, is to be immediately constructed. All surveys have been made. The Government is anticipating the organization of a co-educational medical school by co-operation between the Hackett Medical School and the Canton Hospital, and have given a site sufficiently large for medical school buildings. Parts of the present two institutions can
be retained as "feeders". The new site is less than two miles away, and can be reached by motor-car within fifteen minutes. Many motor buses are running in the city, and they will use the same route, as the traffic is heavy. The gift is in recognition of the services rendered by the Canton Hospital to South China.

**Epidemic Disease in Shansi.**—The usual epidemic diseases are this year claiming a very large proportion of children, and fatal cases of measles and other infectious diseases of children are exceptionally common.

**Salvation Army and Medical Missions.**—"The War Cry," the official organ of the Salvation Army, for February 2nd, 1924, contains references to the medical work carried on by this organization throughout the world. In India, where there are three large hospitals, 51,254 patients were treated during 1922, and 451 major and 1,989 minor surgical operations were performed. During a recent year 43,650 patients attended the William Booth Eye Hospital at Semarang (Dutch East Indies). Leper settlements, maternity homes, and children's clinics are scattered throughout the Dutch Indies, and a new hospital for eighty patients is approaching completion at Soerabaja. In China also the building of a large hospital is planned, and in the Salvation Army hospitals in Tokio 21,995 patients were treated in 1922. Other large hospitals exist in Capetown, Canada, Australia, New Zealand, and in the United States. On the first page is an illustration of the William Booth Memorial Hospital in Covington, Kentucky, and another of the Mothers' Hospital in Clapton, in which, during the last year, 1,729 births took place.

**Chinese Medical Registration.**—In the native city of Tientsin it is a municipal regulation that all who desire to practise medicine must satisfy the police as to their qualifications, and secure a duly endorsed official certificate. But the examination is a mere form; all that has to be done by the applicants is to pay a fee of two or three dollars, and be examined by an official who has not even an elementary knowledge of medicine. Three years ago 400 candidates received certificates; last year 80; and this year 40. To judge by the diminishing figures the supply is overtaking the demand.

**Widening of the Field of Missionary Medical Service.**—The number of patients treated gives a very imperfect idea of the service rendered by a hospital to a community. For example, the number visiting dispensaries fifty years ago was larger than that reported last year. The explanation of this is the number of private drugs stores and the hospital drug store which have become the outgrowth of our missionary work. The decrease really means a healthy development, and reveals the widening of the field of service.—Annual Report, A.B.C.F.M., 1923.

**American Hospital in Jerusalem.**—According to an announcement by Dr. Nathan Ratnoff, president of the American Jewish Physicians' Committee, a modern medical college and hospital will be erected at a cost of $1,000,000 on the Mount of Olives in Jerusalem on an eight-acre site purchased by American physicians and philanthropists. The university, it is stated, will become part of the general scheme of Palestine development undertaken by the American Keren Hayesod. The chemical and biologic laboratory buildings already under construction, will be opened about June 1st.—*Jour. Amer. Med. Assoc.*, June 12, 1924.

**Irregular Practitioners in the United States.**—There are about 55 different kinds of irregular
medical practitioners in the United States. The list, compiled by Health Commissioner Monaghan, is as follows:—Aerotherapy, astral healers, autotherapy, beautifier establishments, biodynamochromatic therapy, blood specialists, bone setters, cancer cures, chromotherapy, Christos (blood washers), chromopathy, diet therapy, diathermy, drugless healers, electrotherapy, electrotone methods, electric light diagnosis, electronic methods, electrotomapro-therapy, geotherapy, hypnotist, hydro-therapy, herbalist, helitherapy, irido-therapy, diagnosticians, Kneipp cure, Leonic healers, mental healing, medical gymnast, mechanotherapy, naturalist, natureopath, neuro-therapy, naprapath, optical institutes, obesity cures, patent medicine men, phototherapy, physic-therapy, psychotherapy, pratotherapy, quartz therapy, Spondylo therapy, sanipractor, spectrochrome, special food faddists, special drug faddists, spectro-therapy, tropho therapy, telathermy, vacuum and serum causes, vitopath, zodiac therapy and Zonet therapy.

This list does not include chiropractic, Christian science, Conesim, physical culture, and new thought. It also totally ignores the old grandmother remedies, and the jumbled advice given by practical nurses, which lack only classification and advertising to be raised into the dignity of cults.

Death of Famous Physiologist.—Jacques Loeb, head of the division of general physiology in the Rockefeller Institute for Medical Research since 1910, and known throughout the world as one of the great medical investigators of the United States, died of heart trouble February 11, 1924, aged 64, at Hamilton, Bermuda, where he had gone to undertake experiments at his Marine Laboratory.

Hospital Control in U.S.A. by Religious Organizations.—The third latest group, but the second largest in bed capacity, is that of hospitals under church control. Hospitals maintained by churches are found in every State except Delaware. Religious organizations for ages have supported hospitals the services of which were usually extended to all classes regardless of their beliefs. The acquiring of converts has almost invariably been a motive secondary to that of relieving suffering. The current opinion of the public, church members and others alike, is that the care of the sick is a burden that should be borne by the whole community, regardless of what organization may take the lead in any hospital project.

Counting the hospitals that are under direct control of the church as well as those that bear the name and have some certain degree of connection, there are 893 with a total capacity of 77,941 beds which care for an average of 49,046 patients.—Jour. Amer. Med. Assoc., January 12, 1924.

Average Cost of Hospital Patients in U.S.A.—In order that we may come to some sort of factual basis, it may be interesting to note that the United Hospital Fund of New York, whose constituent hospitals present to it similar statements, reports that for the year 1922 the average per diem cost for all patients cared for in eighteen general hospitals was Gold $5.15, the highest being $7.75 and the lowest $4.10. In Chicago, taking two hospitals representing two distinct types, one a smaller hospital with a larger proportion of lay patients and the other a larger hospital with a larger proportion of ward patients, we find that their average per diem costs for the first ten months of 1923 was Taels 5.00 and $ 5.87, respectively.—Jour. Am. Med. Assoc., January 12, 1924.

Rinderpest in Shansi.—The cattle disease now diagnosed as rinderpest continues unabated. We hear of villages all round and far afield where from 50 to 90 per cent.
of the cattle have died. The flesh of these diseased animals is invariably sold for human consumption. Outside the south gate of this city and in villages we pass through, the unrestricted public slaughter and sale goes on in a most disgusting and loathsome manner, despite protests by more enlightened Chinese.

Chinese Belief in Demons as Causing Disease.—Another factor that we, who have been born and bred in a Christian land, can scarcely realise, is the psychic relief that inheres in the teaching that there is a God who cares, a God who loves. Many of our patients are oppressed with the belief that they are the victims of the cunning of malignant demons and that their sickness is the manifestation of the wrath of these offended spirits. The idea of God as the Father, whose ever-open ear may be reached by the prayer of the humblest, removes this haunting fear of the unseen, and the psychic relief is of real therapeutic value in the cure of their disease.—L. M. S. Hospital Report, Tientsin, 1923.

Ridding the World of 300,000 Lepers.— Lord Chelmsford, in an address before the Rotary Club, on "Ridding the World of 300,000 Lepers," said that they had now sufficient evidence to come to the public and say that leprosy was curable under certain conditions. The head of the American establishment in the Philippines had told them that when lepers had been treated for three months 26 per cent. seemed to show an appearance of cure, and that when the treatment had been extended for a year or 15 months the percentage was 93. There were two factors in the cure. First they must try to get at the leper in the earliest stages of the disease, and in the second place the treatment must be as long as possible. Leprosy could only be cured if the public would come forward and back up the Association. It was computed that there were something like 300,000 lepers in the Empire, India having the largest share with about 200,000. They believed that if the disease was tackled in earnest, in 30 years they could stamp out leprosy in the British Empire. The Association was asking for £250,000 for that purpose.

To Young Medical Missionaries. — "You will explore for yourselves the mystery and misery, the glamour and the potential glory of other lands and civilisations. Fresh fields wait you in the interests of your Science. You will have opportunities of research and experience such as meet few of your medical associates at home. It will be yours in large measure to pioneer in the interests of social and national well-being to raise the entire standard of life, more especially for women and children. Said a Hindu to a missionary at Amritzar: "'We do not fear your preaching, we need not listen: We do not fear your schools, we need not send our children: but we fear your women and your doctors, for your doctors are winning our hearts, and your women are winning our homes.' In the exercise of your healing art you will overcome prejudice, destroy superstition, undermine caste; while by your life you will commend the love of God in Christ. And these are noble dreams." — Missionary Herald, March, 1924.

Editor's Appeal for News Items. — Members of the C.M.M.A. are asked to be so good as to send in little items of interest for this part of the Journal. News concerning medical missionaries and mission hospitals, reports of some of the queer sayings and doings of Chinese patients and of the strange incidents, — some perhaps of scientific or other value—that happen so often in China, all will be very welcome. To send in a few lines will be very little trouble. Proper credit will be given.
The China Medical Journal

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