SOME CURRENT PROBLEMS IN PROTOZOAL DYSENTERY.*

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One of the most satisfactory things that has come about in connection with the Great War, is the impetus that has been given to the prosecution of inquiries into the cause and spread of infectious diseases. The diseases of protozoal origin have claimed the attention of some of the keenest investigators in the world and the results of their efforts have been the clearing up of many undetermined facts that under other circumstances could hardly have been settled yet. Protozoal dysentery was naturally one of the first problems to be attacked and it is largely through the endeavors of Wenyon and O'Connor and other brilliant British protozoologists that we have been able to secure confirmation of many things we all have believed for many years, and to acquire many new facts in connection with the activities of protozoa in the human intestine.

However, the dysentery problem is not settled yet by any means. Methods of transmission have been determined, the pathology is pretty well understood, as is the general nature of the disease. The essential chronicity of the disease is also an established fact, but in other ways the problem of entamoebiasis stands on about the same basis as the problem of malaria. Among other things to be learned are the factors connected with this chronicity and the determination of the cause of relapse.

I have been asked to present a paper on the dysenteries along the lines of my recent work in Manila. I approach the task with diffidence when I recall the brilliant work of this kind that was accomplished in Manila before my arrival. What little we have been able to do within the past year or two has been accomplished in the intervals between teaching and routine and administrative work.

The work that we started in the College of Medicine and Surgery is now being continued at the Bureau of Science. It may be said to

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fall under three general headings: (1) a study of the action of a new drug, benzyl benzoate, on the protozoal dysenteries; (2) an investigation of the tissue-invasive powers and pathogenicity of certain intestinal flagellated protozoa and their capacity for doing harm in portions of the body other than the intestinal tract, and (3) an inquiry into the bionomics and ecology of the intestinal protozoa—that is to say, a study of the parasites in their relation to their surroundings which, of course, means the host or patient.

I consider the last problem the most important of all from the view-point, ultimately, of both the clinician and the protozoologist—to say nothing of the patient. However, the study of a parasitic species in strict relation to its environment presents serious difficulties that are not met in the study of a free-living species. This is a feature in the career of the parasitic forms infesting man that is yet to be developed on a satisfactory scale. To my mind, it holds out great promise of reward to those who may have the hardihood to undertake it.

I. ACTION OF BENZYL BENZOATE IN PROTOZOAL DYSENTERIES.

Our work with benzyl benzoate can be summarized very briefly and for some of the details I shall refer you to our first report that has recently been published. I was prompted to try the drug on reading Macht's pharmacological and therapeutic study of its action on the musculature of the intestinal tract, and his suggestion as to its possible application in the treatment of entamoebic dysentery. Dr. Macht had a supply of the drug sent to me, and wrote me regarding his experiences with it. We gave it a trial, and achieved surprisingly good results. We have been led, as a result of our observations, to conclude that it is a drug of real value in frank protozoal dysentery. We have had only one case that it did not relieve promptly. We have seen no ill effects produced as a result of its use, but we are not prepared at this time to state that it is a specific for protozoal dysentery. In our judgment, many months must elapse before we shall feel ourselves justified in giving an opinion on that point either one way or the other, even in connection with the relatively few cases that we have treated.

What we can say, however, is this: Following the exhibition of the drug, the distressing symptoms of acute protozoal dysentery, such as pain and tenesmus, quickly subside—usually within forty-eight hours, frequently in less time. With the subsidence of these symptoms, the stools diminish markedly in number. Frequently the fall in number is very striking—almost as striking as defervescence by crisis.
The patient sleeps well—an important factor. With the abatement of the diarrhoea, the stools become feculent and usually are well formed within a few days. Almost invariably the parasites disappear from the stools soon after the treatment is started, and we have noted in several cases that encysted forms do not make their appearance within the period of our observation. However, we think it would be premature to cite this as evidence of the amebicidal action of the drug.

So far as these facts are concerned, the drug would appear to accomplish just about what is accomplished by the ipecac compounds. We consider, however, that there are other points in favor of benzyl benzoate. One of these lies in the ease with which it may be taken, for it has none of the nauseating properties of ipecac and its alkaloids. Moreover, it has no depressant effect on the heart or nervous system, and it causes no renal disturbance so far as we have observed. We consider it indicated in those rather rare cases of bacillary dysentery complicated by acute amœbic dysentery where it is necessary to treat both conditions simultaneously, for we hesitate to give emetine to a patient who is suffering from bacillary dysentery. Pharmacologically, the action of the former drug seems to be mainly sedative on the smooth muscle cell, and an explanation of the effects produced by it may develop through the work of Alvarez and his co-workers on the metabolic gradient underlying intestinal peristalsis.

Our supply of the drug has been very limited, and much of that we had was used in the treatment of a case of lymphatic leukemia, so that, altogether, we have employed the drug in slightly under twenty cases. It is now nearly a year since the work was started, and so far only one patient has reported back to us with a relapse. However, inasmuch as it has been impossible to keep our patients under observation, we have no means of knowing how many are still parasitized.

The case that relapsed was of a severe type. The dysenteric symptoms quickly abated under the treatment and within a few days the man felt so well that, notwithstanding his faeces still contained traces of blood and pus and numerous motile Entamoeba histolytica, he insisted on leaving the hospital. We warned him of the danger of a relapse. He turned up at the hospital about six weeks after his discharge, suffering from acute amœbic dysentery. In the interval he had managed to add a trichomonad infection to his collection of intestinal parasites that already included Ankylostoma duodenale. The trichomonad infection was very heavy and the organisms were of the type that ingest red blood corpuscles.
The patient was very sick and although we were able to reduce the number of his stools and restore them to a feculent character as well as to relieve his pain and tenesmus, there was little diminution in the number of amœbæ and the stools continued to contain variable amounts of blood and pus. When he finally left the hospital he had practically recovered clinically, but he was still a sick man microscopically. The flagellate infection was unaffected by the treatment. In fact I have not been able to see that benzyl benzoate exerts the slightest influence on any of the intestinal protozoa except *Entamoeba histolytica* and *Balantidium coli*. This is in complete harmony, of course, with observations in connection with other forms of treatment. Indeed, there seems doubt of the efficacy of remedies acting through the circulation on lumen-dwelling parasites.

It is held by some writers that entamoebiasis when complicated with flagellate infections is resistant to treatment. I have been inclined to suspect this in a number of instances; but there seems no real evidence to prove the point nor, indeed, any obvious explanation of it if it is a fact.

*Benzyl Benzoate in Balantidial Dysentery.*

We have, so far, tried benzyl benzoate on only one case of balantidial dysentery, but the results have been most encouraging. This case is being studied in collaboration with Dr. Elias Domingo, head of the department of psychiatry at San Lazaro Hospital. We cannot give our final conclusions because the case is still under treatment. The patient is a man, seventy years of age, under detention for senile dementia. He has co-existing infections with *Ancylostoma duodenale* and *Trichuris trichiura*, both of them heavy. When Dr. Domingo first referred the case to me, the man was virtually *in extremis*. His bowels were in almost constant motion, he was suffering severely from abdominal pain and tenesmus and his condition was one of extreme exhaustion. The stools consisted of practically pure pus and *Balantidium coli*. Very little blood was present in the stool. Treatment with proctoclysis and antiseptic enemata yielded no results. We regarded it as extremely likely that the patient would die before any treatment could become effective. Nevertheless, we started him on ten drops of the 20 per cent alcoholic solution of benzyl benzoate, three times a day after meals. The drug was given mixed in a little cold water. Within 24 hours there was marked improvement, and at the end of 48 hours the stools were feculent and the pus had completely disappeared. The ciliates were still present in large numbers, however.
The character of the first stool I examined gave every evidence of the presence of an extensive and acute ulceration of the intestinal tract, and I cannot at this time offer an explanation of the total disappearance of the heavy purulent discharge at the end of 48 hours, especially as balantidia were still present in large numbers. Since then, the parasites have shown a steady decline in number and with the decline has been noted the appearance of not a few balantidia that are obviously in distress as shown by the protoplasmic changes characteristic of degenerating protozoa of the ciliate type. At the time of writing (the eighteenth day since the treatment was started) the parasites have been absent from the stools for nearly a week. Undue stress should not be placed on this for *Balantidium* has a tendency to disappear periodically from the stools even when the patient is not under treatment. The patient is making rapid improvement and eats and sleeps well. We shall follow this case for an indefinite period and eventually report on it more completely.

Our experiences in the treatment of ciliate dysentery in Manila in the past have not been altogether happy and we are inclined to view the outcome of this case, so far as it has gone, with a degree of satisfaction. However, I note that quite recently, Mason has treated a case of *Balantidium* infection in China, with oil of chenopodium and olive oil. In the main, he seems to have achieved results as good as ours, but I gather from the context of his paper that his case was ambulant and in other ways was not nearly so acute as ours.

To summarize my impressions regarding this drug, I would state that so far as our work has gone, I consider benzyl benzoate an admirable remedy for the relief of a patient suffering from acute protozoal dysentery. In that respect, it is possibly not excelled by any of the other drugs customarily employed. However, much remains to be discovered regarding its action on the infection, and cases will have to be watched for a long period after treatment to discover if a cure has been effected. It is still too early to form an opinion one way or the other.

*Giardia Infections.*

The problems arising out of the possible relation of the intestinal flagellated protozoa to dysentery, present many difficulties, and notwithstanding they have been under investigation for a long time, very little knowledge of a positive nature has been developed. There is a tendency, justified in my belief, to regard *Giardia (Lambia) intestinalis* as pathogenic to man, and yet there is very little concrete evidence in its support. *Giardia* infections present a troublesome problem to the
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clinician. They occur in the small intestine where they cannot be reached by rectal injections, and, as *Giardia* is markedly adapted to life on the surface of the epithelium, it would be difficult to reach them by remedies administered orally or hypodermically. Kantor's method for the treatment of hookworm infection by the administration of oil of chenopodium through the intra-intestinal tube is suggestive and might work in *Giardia* infections, provided we employed the right drug. However, flagellated protozoa show a marked tendency to collect in the crypts and folds of the intestine where they naturally escape being swept out in the circulation of the fluid contents of the gut. In many cases the reproductive phases occur in these sheltered localities.

**Trichomonad Infections.**

The problem presented by the trichomonad forms is one of considerable interest biologically. I am inclined to regard some of these as being in rather an advanced stage toward obligatory tissue parasitism. The evidence in some of the lower animals is much more convincing than it is in man. Such evidence as we have accumulated in human infections indicates to me that, while they have not achieved obligatory tissue parasitism, nevertheless, under certain conditions some of them are capable of living in parts of the body other than the intestine.

The general run of trichomonads* found in the intestinal tract appear to feed on the bacteria and other lower plant forms found there, as is the case with *Entamoeba coli, E. nana,* and other lumen-dwelling forms; but recently I have been encountering infections in which there occur what, provisionally, might be termed "strains" of trichomonads that ingest and digest erythrocytes. These strains frequently crop up in cases of frank dysentery attributable to other agents, where the stools contain immense numbers of free erythrocytes. Trichomonads are often found in dysenteric stools, and appear to behave in much the same manner as those found in normal stools, but occasionally I come across cases where the trichomonads are greedily devouring the red blood corpuscles. Under identical conditions, other strains do not do this, for one sees the flagellates swimming about amongst the corpuscles and making no effort to ingest them. So far, I have not been able to satisfy myself of the identity of the species in all cases, or to determine if this property is possessed by one species alone. Our first case was presented by a species of *Pentatrichomonas,* probably identical with Chatterjee's

*Under the term "trichomonad," I include *Ditrichomonas, Trichomonas, Tetratrichomonas* and *Pentatrichomonas.*
Peptatrichomonas bengalensis, but subsequent observations have led me to suspect that other species may possess the same faculty.

II. PATHOGENICITY OF INTESTINAL FLAGELLATES.

The ability to ingest and digest erythrocytes suggests to me that the animal has become adapted, to a degree at least, to a carnivorous diet, and that when the conditions favor its entrance to the tissues or to body cavities other than the intestine, it not only can live and prosper, but may exhibit potentialities for harm. Undoubted trichomonads have been reported in the circulating blood of several of the lower animals, and there is no doubt that the organisms can exist there over a period of time. Unfortunately, we have few data as to their mode of nutrition under those conditions, but it must be pointed out that the trichomonads are uniformly holozoic, in which respect they differ from flagellates of the trypanosome and herpetomonad group, that are saprozoic. It will be interesting to discover if they undergo structural and physiological modifications during their life in the blood and tissues.

At present I am studying the material derived from a case of trichomonad infection of the pleura in a Chinese, in which numerous trichomonads were discovered in the aspirated pleural exudate by two of my former students, Drs. Filoteo and de Leon. Dr. de Leon and I are now preparing a report on the protozoological and pathological findings in the case, the patient having died a few hours after the discovery was made. Flagellates have been reported from the lungs of man in the past, but very few informative data have accompanied these reports. We believe that this case will form an interesting addition to the evidence that is accumulating regarding tissue invasion by the trichomonad flagellates.

I am of the belief that these flagellates will, under certain circumstances, leave the intestine and spread to other parts of the body, but, at the same time, I am inclined to regard the occurrence as probably fortuitous so far as the parasites are concerned. I regard the phenomenon as indicating a growing degree of adaptation to tissue parasitism, for it has involved a radical change of diet on the part of the parasite. At the same time, we must regard the existing condition as rather unfavorable to the parasite which is faced with the serious problem of transmission to another host after it has entered the circulation or penetrated to some body cavity that lacks a natural outlet to the outer world. This, of course, suggests the necessity for insect vectors, but the suggestion carries us into the discussion of a problem in
evolution that extends so far into the future as to make speculation on it a little out of place at this time.

For the present, then, I believe we must regard the intestinal flagellates with increasing suspicion, and watch for cases where they show a tendency to wander from their normal habitat. I believe many more of these cases occur than we have record of, but the clinician is forced to wait on the laboratory worker for more definite information.

III. BIONOMICS OF INTESTINAL PROTOZOA.

The foregoing naturally leads to our third line of attack. The use of benzyl benzoate in the treatment of protozoal dysentery adds another to the long list of drugs with which one can successfully control acute entamebic dysentery. It is an open question as to whether we can regard any of them—ipecacuanha and its alkaloids not excepted—as a specific for the disease. It is also questionable as to whether any of them are actually amoebicidal when therapeutically applied. Under the cover glass, it is easy to kill protozoa by solutions of a number of poisonous and non-poisonous substances. Within the body of the host, the conditions change. A drug that is strongly amoebicidal in vitro, may be useless in treatment, and, vice versa, a drug that is less toxic in vitro may bring complete relief when administered to a patient suffering from acute entamebiasis. I have long held that in vitro experiments on parasitic protozoa were of doubtful value and have warned my students and assistants against laying too much stress on the results of therapeutic experiments on laboratory animals inoculated with strains of human parasites. The experimental work of Dale and Dobell on the therapeutics of amoebic dysentery indicates that there is justification for these views and, furthermore, has added to what we are growing to believe regarding the reactions of hosts on their parasites.

Moreover, the work of these two investigators strongly indicates, as they state, "that the therapeutic efficacy of emetine is a result of its action upon the host rather than upon the parasite."

One naturally speculates as to what becomes of the parasite in the course of this interesting process. If the drugs we employ are not amoebicidal, and the patient ceases to exhibit clinical symptoms of dysentery and fails to discharge cysts in his faces, are the parasites in the tissues still living, or has something else brought about their destruction? Had we a more complete knowledge of the life histories of Entamoeba histolytica and Balantidium coli, and were we able to combine that knowledge with information regarding their daily life and the influence exerted upon it by changing physiological conditions in
the host, we might be able to make a start toward the solution of the whole problem. Unfortunately, we lack that knowledge.

This is a piece of work calling for collaboration between specialists—the physician, the protozoologist, the pathologist, the physiologist, and the pharmacologist. The burden of the work is fairly distributed among them all. As a protozoologist I am of the belief that a knowledge of the ecology and bionomics of the parasitic protozoa is necessary before the conditions to which they give rise may be thoroughly understood and treated. From the viewpoint of the parasite the problem might lie in the development of additional knowledge on three of the dominant physiological activities of the organism, viz.: food-getting, or the general problem of nutrition and adaptation; reproduction, including fertilization and allied phenomena; and, lastly, irritability, including an inquiry into the response of the organism to varying stimuli received from the host.

Three pieces of investigation carried out on free-living protozoa within the past few years promise to help us. I refer to the work of Woodruff and Erdmann on nuclear reorganization or endomixis in *Paramaecium*; to a process that seems to be somewhat similar, described by MacCardy as occurring in the testate rhizopod *Arcella vulgaris*, and to Calkins' recent important work on *Uroleptus mobilis* in which he has demonstrated that protoplasmic rejuvenescence is a consequence of fertilization. All of these I believe are destined to be of importance to us in the development of our knowledge of the parasitic protozoa infesting man, particularly those that are known to be tissue parasites. The self-limitation of coccidial infections, through the development of the sexual phase of the life cycle, has already become recognized as an application of this.

Our knowledge of the life histories of *Entamoeba histolytica* and *Balantidium coli* are far from complete. As regards *Entamoeba*, we have no information of a definite character concerning fertilization or its equivalent—if, indeed, there can be any "equivalent" to fertilization. In *Balantidium*, we know that conjugation occurs, although the details have not been worked out. We are also told that cysts containing two or more individuals have been observed, but it is uncertain, in the first place, whether these actually were cysts of *Balantidium*, and secondly, if they were, whether they were copulation cysts or reproductive cysts. The occurrence of more than two individuals within a cyst would seem to indicate that the process is reproductive rather than syngamic.

Infections with both these organisms tend to run a chronic course. Dobell and Stevenson have traced the histories of cases of entamoeb-
biasis that continued for from 16 to 34 years, and we know that Balantidium infections run a long course. In cases such as those described by Dobell and Stevenson, it seems to me necessary to consider the question as to whether they represent long periods of true chronicity, or the sum of periodic auto-reinfections of the patient through the reingestion of the cysts he has, himself, been discharging.

In any event, this chronicity tends to be punctuated at intervals, by acute exacerbations—true dysentery, later lapsing back to the chronic state. Two questions, therefore, arise: First, how does the organism maintain its vitality over these long latent periods? Secondly, what is the cause of relapse in protozoal dysentery?

I see no reason to doubt that the need for fertilization is just as pressing, if not more so, with the parasitic as it is with the free-living protozoa. How is this need met?

With Entamoeba there are, of course, at least three possibilities: an autogamous process similar to that described as occurring in Entamoeba murs; nuclear reorganization such as MacCardy seems to have demonstrated in Arcella, a closely related species, or an exogamous process similar to that described by Schaudinn in Centropyxis aculeata. Unfortunately we have no evidence of any of these. Perhaps an opening may be found in an interpretation of certain cyclical changes that have been described in the nuclei of the parasitic amebae, that later may be determined to be in the nature of an intranuclear reorganization process or endomixis, for it must be recalled that the promitotic nuclear division in amebae of this type occurs uniformly within the nuclear membrane or, when that is absent, within the nuclear area.

In Balantidium, we know that conjugation apparently occurs. This is aside from the rather remote possibility that what has been observed and reported as conjugation, might merely have been plastogamy. But, apparently, this process is very rare, for it is yet to be described in anything approaching detail. I have studied many cases of balantidiasis, but I have yet to see a pair of conjugating balantidia. That leaves us with the possibility that endomixis may occur in the tissues, and be the means by which Balantidium maintains its vitality over these long periods of chronicity.

This brings us down to the question as to the cause of relapse from a chronic to an acute stage in the protozoal dysenteries. Is it due to heightened vitality resulting from some sexual process that raises the division rate of the organism to a pitch where parasites are produced

* I regret to state that I have seen MacCardy's paper in abstract only, so I make the above statement with due reservation.
more rapidly than can be compensated for by the normal reparative processes occurring in the tissues of the host? Or does the division rate rise as the result of the removal of some inhibitory influence, or the application of a stimulating influence, either of them derived from the host?

We, perhaps, can conceive of some substance in the body of the host, possibly the product of an internal secretory gland, that inhibits the division rate of the parasite and keeps it within bounds, the removal of which leaves the parasite free to range through the tissues in greater numbers. Or, on the other hand, can we not think of some substance, elaborated at irregular intervals, by the host which raises the division rate of the organism and precipitates an attack of dysentery? In this connection the work of Bayma and others on the role of the adrenals and the application of epinephrin in the treatment of amebiasis is interesting.

All this is more or less speculative, to be sure, but it seems to me to indicate some interesting lines of inquiry.

Rarity of Entamöebiasis in Filipino Children.

One or two other points occur to me before closing. One of these is the apparent rarity of amebiasis and balantidiasis we have noted in Filipino children under fifteen years of age. This has been noted clinically by every practitioner in the Islands with whom I am acquainted. Is there anything in the physiology of the child that inhibits infections with the obligatory tissue parasites?

Hepatic and other Complications of Amœbiasis.

The factors underlying the incidence of hepatic and extra-intestinal involvement in amœbiasis remain to be discovered, as has been pointed out by other writers. In some instances, hepatic complications appear to develop soon after the initial infection. In other cases, they may be deferred for years. I recall one case that came under my observation a few years ago. The patient had suffered from a primary attack of intestinal amebiasis from which he had, in due time, recovered. He showed no clinical symptoms of amœbiasis over a period of twenty-five years. At the end of that time he became very ill, and subsequently the surgeon was called upon to evacuate a huge amœbic abscess in his liver. He narrowly escaped death. The question is complicated by the difficulty of determining the probable time at which a given amœbic infection occurred. People may be infected with Entameba histolytica for many years before they show clinical evidence of it.
The Different Strains of Entamoebæ.

Dobell and Jepps have recently demonstrated the existence of distinct strains of *Entamoeba histolytica* as shown by the constant size of the cysts they produce. These authors claim to have demonstrated five separate races of the organism. Other workers dispute the existence of more than two strains, but it seems evident that there is more than one strain or race. So far, we have no evidence that these strains differ from one another except in the sizes of their cysts, but it would seem desirable to make long and careful studies of the clinical symptoms and other phenomena exhibited by dysenteries infected with the several strains, with a view to discover if the strains vary in virulence or other characteristics.

*Entamoeba histolytica* is in danger of losing its reputation as the sole pathogenic species in man. In a personal communication to me, Professor G. C. Chatterjee, of the Calcutta Medical College, states that he has discovered a new pathogenic amoeba of man. Professor Chatterjee's paper is now in press so it would be improper for me to anticipate his report with either discussion or criticism. This amoeba, which appears to be of the limax type and which, in some respects, resembles *Entamoeba nana*, he has named *Entamoeba paradysenteria*. It apparently is the cause of a peculiar type of lesion in the small intestine, and also appears in a remarkable involvement of the peritoneal aspect of the intestine.

The problem of laboratory diagnosis is one of great interest to the practising physician so I presume it is appropriate to say a few words here regarding it. I regret to have to state my conviction that the differential diagnosis between *Entamoeba histolytica* and *E. coli* is little, if any, easier today than it was several years ago. If the encysted forms of the amoeba are present, diagnosis is relatively easy. Those who are unfamiliar with the characters of the various cysts can secure assistance from the article on protozoan cysts by Matthews. The difficulty lies in the fact that cysts are frequently absent from the stools at the time when it is most necessary that a diagnosis should be made.

The task of the identification of the trophozoites is one that often taxes the resources of the trained protozoologist, and I am of the opinion that diagnosis can best be made by such a man, especially when the question arises as to whether a given patient has been cured or not.

Notwithstanding the discouraging statements made by Yorke and Macfie in their recent paper, I believe we are still justified in laying considerable stress on the inclusion of erythrocytes in the cytoplasm.
This belief is strengthened by recent observations we have made in Manila, in connection with the ingestion of erythrocytes by trichomonads. We have granted, for the present, that *Entamoeba coli* and other intestinal protozoa may, under certain circumstances, ingest blood corpuscles, but we advance the view that this is less important than the determination as to whether or not the ingested corpuscles are digested. Digestion of the corpuscles, evidence of which may be seen in any acute *Entamoeba histolytica* infection, presupposes a certain degree of adaptation to a carnivorous diet, which would appear to lie on the threshold of tissue parasitism, for it must be recalled that the lumen-dwelling forms (with *Giardia* and some others which are saprozoic, excepted) are vegetarians, and such other matter as they may take in, such as corpuscles, cysts of other protozoa and the like, are not digested, but appear to be carried about in the cytoplasm for a while and then expelled.

Until this question is settled by more extended observations than those made by either Yorke and Macfie or ourselves, we shall continue to make our diagnoses on the morphology of the organism (including the cysts when they are present), the inclusion of blood corpuscles, and the general character of the cellular exudate in the stools as outlined by Willmore and Shearman. We shall also continue to take into account the presence or absence of Charcot-Leyden crystals which Acton has shown have a very high association with entamoebic dysentery. In this way one can build up a composite picture which, in our experience, seems to be borne out, in the greater number of instances, by the clinical developments in the case. But, in spite of all this, we are frequently forced to admit our inability to make a definite diagnosis and we report: "*Entamoeba histolytica* not found; character of the stool suggests amoebic [or bacillary] dysentery. Furnish another fresh specimen."

The Chronicity of Amoebic Dysentery.

The proverbial chronicity of amoebic dysentery and the tendency of the acute symptoms to subside under a great variety of forms of treatment, carries the lesson of caution in discharging a patient as cured. When it is possible, I like to follow these "cured" cases for at least six months. This sounds troublesome and discouraging to the physician and the patient, but it is only simple justice to both, besides which, it is less troublesome and discouraging than liver abscess or other extra-intestinal involvement. Examination of these cases should include the careful extraction and centrifugation of the stools by the
method of Cropper and Row by which means small numbers of cysts may usually be detected.

The rules laid down by Dobell in his study of cases and carriers of amebic dysentery, are well thought out with a view to practicability and a reasonable degree of thoroughness and for that reason I quote them:

"Untreated cases may be examined six times on any six days convenient to the examiner. Since there is no evidence of any periodicity in the occurrence of positive or negative examinations, i.e., since the distribution of these appears to be at random — there is no reason why the examinations should not be made on any days selected at random. The chances of finding the infection, if present, are as great for any one day as for any other day.

"Treated cases should be examined six times on six appropriate days — not at random. No negative examination made during or immediately after treatment should be included. The first of the six examinations may appropriately be made three or four days after the end of the treatment. (By this procedure many cases unaffected by the treatment will be quickly detected.) The second examination may be made one week after the first (i.e., about the tenth day.) The four remaining examinations will be most profitably made a week later, when the infection, if still present, will probably have returned to normal, and will therefore be detected more readily than during the earlier part of the period following treatment. A typical case examined on this system would thus be kept under observation for a period of not less than three weeks after treatment. During this time it would be examined six times on approximately the following days after treatment: 4th, 11th, 18th, 20th, 22nd, 24th. (The last four examinations could be made on the 18th, 19th, 20th and 21st if necessary, or extended with advantage over a longer period.)"

This entire subject is one of great interest to me and I offer that in extenuation of my having presented it to you at such length. It is a matter of great regret to me that I cannot read this paper to you myself, and participate in any discussion it may provoke. However, let me thank you in all sincerity for your courtesy in asking me to present it and for the patience you must have exercised in listening to it.

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SURGERY OF A WAR HOSPITAL IN ENGLAND.*

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The hospital at which the writer was stationed during the great war, and where he had charge of some five hundred beds, is situated on the south-west of England and had previously been a lunatic asylum. It received its cases at first almost direct from the trenches in France; but later, as the French organization was improved, more and more came after previous treatment in a hospital on the French side of the water. With a few exceptions, practically all classes of cases were received, from mere clean bullet wounds to the most extensive visceral and bone injuries; later, having made good in the work, the hospital was made a centre for orthopedic operative cases and some of these will be referred to later. The main exceptions as to cases admitted to the hospital were plastic face and jaw cases, which were removed at once to special hospitals; and fractured femur cases, which after the first few months were treated only in special hospitals. Head injuries almost disappeared from our admissions after the adoption of iron helmets, the remaining cases being either so severe as to be rapidly fatal or else treated almost entirely in France. Visceral wounds were more and more treated throughout in France as the war proceeded and we finally saw them in little more than their convalescent stages. What we did see gave us a very high opinion of the wonderful abdominal surgery carried out at the C. C. S.

I understand that equally fine work was carried on in the special femur hospitals and it would be of no little value to the Association if a paper on this subject could be published in the JOURNAL from some member who had worked in these hospitals. Perhaps what impressed one most was the extraordinarily low death rate among the m.n. admitted to hospital, many of them suffering from extremely severe wounds. Of course it has to be remembered that the bulk of the men were young and in fine physical training. Our own figures for four years are as follows: admissions—which included, especially in the winter time, a fair sprinkling of medical cases—29,000 odd. Deaths, 133. Of these deaths, 42 were not directly due to war service, as six were due to malignant disease and seven to influenzal pneumonia, and the rest were mainly due to pre-existing visceral disease.

* Read at the C. M. M. A., Conference held in Peking, February, 1920.
Statistical Summary of Surgical Operations.

It is impossible in a paper like this to deal with the whole of the surgical work that passed through one's hands and I must content myself with dwelling on a few of the more salient features especially in connection with subjects that have given rise to considerable discussion. Before doing this, however, a brief statistical summary of the operative work in my own half of the hospital may prove of interest to the meeting.

There were, in the four years, 3,342 operations under a general anaesthetic in my operating theatre. These can be roughly divided as follows:—

**UNCLASSIFIED**: 292. Mainly minor operations for removal of toenails, moving of joints, breaking down of adhesions, etc.

**GENERAL**: 1,600. Including 701 for the drainage of abscesses and the curettage of sinuses; 609 for the removal of foreign bodies; and 175 for the secondary suture of wounds.

**OPERATIONS ON HEAD**: 15. These consisted of 8 craniotomies and 7 operations for acute mastoid disease. This really gives no indication of the number of such cases admitted to the hospital. Brain operations have never come in my way abroad and I was only too thankful to hand over, as far as possible, all such cases to my colleague in charge of the other half of the hospital who was very skilled in this work.

**OPERATIONS ON SPINE**: 3. Laminectomies.

**AMPUTATIONS**: 1st and 2nd, 253.

**TENDON OPERATIONS**: 30.

**JOINT OPERATIONS**: 55. Of these, 22 were for removal of loose semilunar cartilages, results being very satisfactory; 11 were for excisions of the elbow.

**BONE OPERATIONS**: 601. Including 438 sequestrectomies; 34 platings; 26 wirings; and 9 bone graftings.

**OPERATIONS ON BLOOD-VESSELS AND FOR HAEOMORRHAGE**: 114. Including 20 for aneurysms, and 54 for secondary hemorrhages.

**NERVE OPERATIONS**: 91. Including 60 for freeing nerves from scar tissue; and 28 for suturing of nerves.

**CHEST OPERATIONS**: 20. Drainage of empyema, 13 cases; and 7 cases of thoracoplasty.

**ABDOMINAL OPERATIONS**: 167. The conditions necessitating abdominal operations were nearly all not directly the results of
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war service. The operations included 79 for radical cure of hernia; 59 appendicectomies; and 10 gastro-enterostomies.

**RECTAL OPERATIONS:** 68. Mostly for piles or fistulae.

**URINO-GENITAL OPERATIONS:** 33.

Total 3,342.

*Treatment of Septic Wounds.*

I now propose to deal particularly with some of these groups of operations, suggesting lessons that have been learned from them and illustrating with detailed reports of a few of the cases. General operations include a large bulk of the simple septic cases. The problem of rendering these wounds free, or relatively free from pyogenic organisms of the more virulent types, was one which early attracted a large measure of attention in the surgical world and gave rise to a variety of new antiseptic preparations and novel methods of treatment. Each as it came was widely advertised as the final specific for all forms of septic infection, but none of them has carried conviction to the majority of the surgeons at home. The Carrel-Dakin treatment was undoubtedly the most successful and the most promising of these, but the skill and attention that the treatment demands must prove a formidable barrier to its successful use generally. Certainly the patients who were sent back from France with the tubes still in position were a poor advertisement of this treatment. The wounds were, as far as my own experience went, without exception heavily infected with pyogenic organisms, the tubes frequently leading into dependent bags of pus, which needed counter incision and effective drainage to clear up. An application in great use at one time for infected wounds was Bipp (bismuth, iodoform and paraffin paste). I have no doubt that it had its value in certain cases, but the number of cases of bismuth poisoning that at one time we had in hospital hardly spoke well for the uncontrolled use of this preparation. Many of the cases were only slight but the condition added considerably to the discomfort of an already wounded man.

Among the antiseptics that, for a time, had a great vogue, there was none more popular, for a brief period, than flavine. Its actual antiseptic properties were, however, small. We were able to carry out an experiment soon after the drug came on the market which early convinced me of this. I think the case is worth recording. A man was admitted under my care with a severe and septic wound of the right shoulder joint. The day after admission he complained of pain in the left knee joint which was slightly swollen. The following day
the joint was more swollen and aspiration of the fluid showed a short-chained streptococcus to be present. The joint was then opened; turbid synovia was present. Thorough irrigation with normal saline was carried out; this was followed by irrigation with fresh 1:1,000 solution of the drug mentioned and the capsule was sutured. Here, apparently, one had as near an approximation to an "in vitro" experiment as one could possibly obtain in the human body. The result was entirely disappointing; after an apparent improvement for a day or two the joint again became distended with fluid, and aspiration showed the fluid to be teeming with the same kind of streptococci. Incision and drainage of the joint had to be carried out and the usual result of a stiff knee followed. Despite this experience we still regard flavine as a valuable drug, and it might have been regarded as still more valuable had fewer absurd claims of its antiseptic virtue been made. There is no possible doubt that when applied to an open septic wound on gauze wrung out in the solution and frequently changed, the wound usually cleans up quickly, takes on an appearance of rapid healing and the bacterial content is speedily reduced. This, however, appears to be due not to any special antiseptic virtue but to the property the drug possesses of stimulating cellular growth and activity, the cells themselves dealing with the bacteria. Continuous use of the drug cannot be carried on very long or ulceration of the newly formed granulative tissue ensues. As a preparatory treatment for the secondary suture of wounds it proved of considerable value.

Secondary Suture of Wounds.

The question of secondary suture of wounds with a view to early healing and the avoidance of excessive scar, proved of great importance. This was especially so owing to the large drainage incisions and the extensive excision of dead tissues which these highly infected wounds required. The time when such suture should be performed gave rise to no little discussion. A number of writers have placed special importance on the value of bacteriological examinations in this connection, insisting that suture should not be carried out until the germ content of the wound is reduced to a few harmless staphylococci. In my own experience, I have found that there is considerable danger that while one waits for this ideal consummation the best time for suture has been missed. If possible, the more virulent forms of cocci, and especially anaerobic organisms, should be cleared from the wound before suture is undertaken; but the following is an example of the satisfactory results that may be obtained even when conditions are not ideal.
A man was admitted under my care with a superficial wound of the back of the right forearm. Cellulitis had supervened and extensive incisions had been made, perhaps not wisely but too well, along the outer part of the arm. The incised skin had retracted to each side so as to reveal many of the muscles and tendons. Some suppuration still persisted and examination showed a mixed infection with a few streptococci still present. It was evident that if suture were to be delayed until the wound was quite clean, much granulation tissue would form and the subsequent adhesion of muscles and tendons would be very serious. In addition to this the lateral retraction of the skin would make delayed suture very difficult. I decided to suture the wound at once and chance the ensuing suppuration. The result was most satisfactory. A few small local pockets of pus formed and stitches had to be removed here and there, but from a clinical point of view the effect was excellent, the man got good use of the arm and hand, and subsequent massage practically freed the tendons from all important adhesions. The rule we came to was to leave the wound, if possible, till a perfectly successful result was certain, unless clinical reasons made early suture important. In the large majority of cases suture could be successfully carried out even in the presence of sepsis if tension on the flaps could be avoided, though naturally the final healing was considerably delayed by the formation of local septic foci.

Amputations.

Amputations, as already stated, numbered 253. The majority of these were of course secondary operations, the primary amputation having been performed in France either for damage to vessels or for gas-gangrene, shortly after the patient had been wounded. Many of them were but minor operations on fingers and toes; but some 150 were major amputations of arm or leg, and these were sufficient to give one considerable experience in this particular line. For a time fierce controversy raged over the question of the so-called guillotine amputations and there was a time when practically all the cases coming over from France were of this nature. A guillotine amputation was one in which a circular amputation was carried through the limb, dividing bones, muscle, and skin all at the same level, the wound being left open. The advantages claimed for it were speed in execution, the saving of tissue by performing the amputation close to the site of the injury, and the freedom from spreading sepsis and secondary hemorrhage ensured by leaving the wound completely exposed. The objections from the point of view of the surgeon in England were, the amount of pain
the patients suffered during the dressing of the wound, the necessity for a second amputation in every case, and the amount of tissue that often had to be sacrificed owing to the frequent retraction of the skin of the stump, which it was often impossible to prevent. Extension applied to the skin flaps was advocated to prevent this retraction; but in our experience such extension was often very painful to a patient whose nerves had suffered badly from the extensive injuries he had sustained and it could seldom be employed. Further, we English surgeons pleaded that gas-gangrene being an affection of the muscles only, there was no reason why skin flaps should not be left even if these were stitched back so as to leave the wound fully exposed. No doubt there was much to be said on both sides and it was a great pity that the Medical Department of the War Office did not arrange a regular interchange of surgeons between France and England that the difficulties on each side might have been more fully appreciated. In the end it would seem that the surgeons on our side won, as towards the end of the war patients upon whom guillotine amputations had been performed came over in very much smaller numbers.

Two lessons we learnt in the course of the work in regard to amputations. One of these was in regard to septic cases where amputation had to be performed through definitely septic areas or where sinuses ran through the field of operation. In these we cut skin flaps of more than usual length, often irregular so as to avoid damaged areas, but the essential was that they should be considerably longer than the ordinary flaps for a clean amputation. At the end of the operation these were trimmed to make a good apposition of skin at the terminal portion of the flaps which were then carefully sutured. The flaps were left quite unsutured at the sides. The cavity between the loose flaps and the rest of the stump was packed with gauze in long strips and a through-and-through drainage tube inserted from side to side. Every few hours the tube was irrigated with Dakin’s solution, the gauze being thus kept constantly wet with fresh antiseptic lotion. The plugs were never removed in the ordinary, way but the strips gradually began to wash out with the constant irrigation and as a piece came out it was cut away from the rest. In the course of about a week the whole of the gauze thus came away without disturbing the wound and leaving clean, healthy granulations behind it. The flaps gradually contracted down, the tube was finally removed and the side wounds granulated. I can highly recommend this as a very satisfactory method giving good results with a minimum of pain to the patient.
The other lesson was on the after-treatment of leg stumps. Unfortunately, it was only learned towards the end of the war. It consisted in fitting temporary plaster limbs—or pylons—as soon as the operation wound was healed, sometimes even before it was completely healed. In case of amputation of the thigh the only requisites were:—plaster bandages and plaster of paris—good ordinary plaster for the greater part, and best dental plaster to finish off with; two flat strong sticks (pieces of old crutches were often used), the inner of these reaching almost to the crutch, the outer almost to the crest of the ilium; these were strengthened about where the knee should have been with a cross-piece and fitted into a rounded block at the foot; to the bottom of this was nailed a round piece of rubber, such as the rubber heel of a boot, to prevent slipping. The method of fitting was to make the patient stand upright on his sound leg; the stump was then thickly spread with vaseline; a few turns of plaster bandage were then placed round it and the wooden skeleton put in position; short strips of plaster bandage were then applied, making figure of eight turns round the sticks on either side till the whole of the sticks on either side of the stump were completely buried, crevices being filled up from time to time with wads of wool soaked in a mixture of plaster the consistency of cream. The plaster was carried well up to the fork on the inner side, to the crest of the ilium on the outer side, and moulded well under the tuberosity of the ischium behind. The mould which now had attached to it the wooden skeleton was removed and put in a warm place to dry. The next day the patient came again to be fitted. Where the edge of the plaster was rough to the skin it was cut away, the edge above was bent over, and the whole finished off perfectly smooth with small strips of muslin soaked in a plaster mixture. The result was a light artificial limb, costing almost nothing, which bore the weight of the body with no pressure at all on the wound; the lower end of the plaster case was usually left open. A knitted stocking was fitted on the stump to prevent rubbing. It should be added that an iron hook was fixed in the plaster on the outer and posterior side when the rough mould was made. From this a webbing brace was carried across the shoulders to keep the limb in position. Crutches were not allowed to be used for more than two days, by which time the patient could easily walk with a stick and before long even without the help of this. In the case of amputations below the knee a similar device was used, the weight being borne on the lateral prominences of the tibia and fibula below the knee; but in this case a jointed piece of iron was fixed in the plaster below the knee on either side and carried to a strap or board.
fixed round the thigh. The enormous advantage of these contrivances was that they were cheap and easily replaced, and as the stump changed in shape the plaster part of the limb was broken up and a new mould made. Above all, the long period of invalidism with the wasting for want of use that stumps ordinarily undergo was completely avoided. Finally, the stumps were in a far better condition for fitting with a permanent limb when the time for that arrived.

_Tendon Operations._

There was one particularly fascinating class of cases under this heading—the operation for replacing paralysed extensors of the forearm by transplanting flexor tendons. Among injuries to the nerves one of the most common was damage, more or less complete, to the musculospiral nerve. This was often accompanied by serious wounds of the humerus which were usually very septic. In not a few cases, the damage to the nerve was so extensive as to make repair quite impossible, resulting in complete extensor paralysis of the forearm and a practically useless hand. The tendon transplantation for this was one of the most interesting and successful of our operative procedures. At first we followed Murphy's clinical procedure; but Murphy to my mind throws too great a strain on the flexor carpi radialis in requiring it to bear the brunt of the action of the whole of the extensor tendons of the hand. Jones' operation is the most satisfactory where the hand will be needed for manual labour. On the other hand, Jones' incisions do not give good access to the tendons. Finally, I employed Jones' modification but with incisions that approximated pretty closely to Murphy's original description. One other small tendon operation that I did seemed to open a new, if limited, field, and its success was so striking that I should like to describe it in detail.

A young man was admitted with a small wound of the right hand. A bullet had struck a glancing blow on the back of the index finger just distal to the metacarpo-phalangeal joint. The bone was uninjured, but a small piece of tissue a little larger than a sixpence had been taken off right down to the bone, including the whole thickness of the extensor tendon. The finger was useless and in the way, yet it was a serious matter for a man in his position to lose the right index finger. A simple suture of the tendon would have been useless as it was hardly possible to get skin to cover the wound, and nothing could have prevented the sutured tendon from becoming adherent to the underlying bone which was quite stripped of all soft tissue, including periosteum. The plan I adopted was the following:—the wound
was allowed to granulate and heal, and no operation was attempted till sufficient time had elapsed to secure primary healing at the time for operation. The finger was then incised and the divided ends of the tendon found and lengthened till they could be approximated without tension. The median cephalic vein, which was a large one, was next dissected out and a suitable piece removed. This was slipped over one end of the tendon, the splicing of the tendon was seen to, and the sleeve of vein pulled down to cover the part of the tendon crossing over the bare area, the upper and lower ends of the vein being fixed to the tendon sheath above and below the wound. Finally, by lateral incisions of the skin a cutaneous covering to the wound was obtained. The result was most satisfactory and the patient was discharged with excellent extensor movement of the finger.

**Bone Operations.**

Among these were 488 operations for removal of dead bone, mainly from the arms and legs. In themselves such operations were, as a rule, of minor importance, but in heavily infected war wounds they frequently proved a source of some anxiety, in that they were often followed by fresh septic infection and a more or less serious reaction due to the unavoidable opening up of fresh healthy tissues. The question arose whether anything could be done to mitigate these unfortunate results. I was sorry that a very important and interesting book on the use of vaccines for this purpose came into my hands only very late in our work in the hospital. However, we began at once to experiment on the lines therein laid down and with some measure of success. There is no doubt that in suitable cases a mixed autogenous vaccine, made from the infecting organisms of a wound, can control to a very marked extent the objectionable reaction that follows on necessary surgical interference. There is, however, an important limitation to the treatment in the case of war-wounds. Many of these are infected with spore-bearing organisms, and it is almost impossible to destroy the vitality of such organisms by the methods usually employed in the preparation of vaccines of killed germs without destroying the efficacy of the vaccine itself. The preparation of sensitized vaccines of living germs I did not myself attempt, and in any case there are serious objections to the use of vaccines of living organisms where spore-bearing germs are concerned.

Under the heading of bone operations comes also the consideration of bone-plating, wiring, and grafting. When I began my war work a fierce controversy was raging over the question of the plating of septic
fractures of long bones. On the one hand, were those who advocated plating all difficult fractures whether septic or not; on the other, those who regarded it as a crime to insert a plate unless the wound were quite aseptic and maintained that nothing but disaster would follow the attempt in a septic wound.

The truth, as often, lay between the extremes. It is seldom wise to insert a plate in a septic case; it is occasionally necessary, however, to do so if a good functional result is to be obtained, and the risk is not very great if a simple rule is followed. I propose to illustrate the necessity and prove the possibility of doing this safely, not by detailing a case, but by including with this paper two X-ray photos of a case I so healed. The first shows a very extensive and comminuted fracture just above the elbow. I believe that no ordinary treatment would have got a union here in satisfactory position without a resulting stiff elbow. Even in much simpler cases it was surprising to see the number of men that were sent home from France with stiff elbows owing to unwise or prolonged splinting in septic cases of compound fracture. My second photograph shows the same arm after plating. The result as to position speaks for itself; the functional result was good, movement at the elbow joint was good and steadily increasing under massage when the patient left the hospital. The last that I heard of him was that he was back on active service with his regiment in France. But there is just one all essential rule in cases of plating septic fractures. No stitches whatever must be put in the wound, which must be left open right down to the bottom and loosely packed with gauze-plugging down to the plate, frequent antiseptic dressings being applied. If this rule be followed there is little danger in the plating, though it does not follow on this that the plate will necessarily hold long enough to ensure good union of the fracture. Plating of a septic fracture should very seldom be necessary and whenever possible wiring of the broken ends should be substituted for it. For some reason or other wiring of a septic fracture seems without the risks that attend plating in septic cases. Why this should be is not quite clear unless it is that the screws convey infection into the bone without leaving drainage space, whereas there is always plenty of room for drainage through any hole that carries a wire. We wired many such cases and none of them caused us any anxiety.

*Operations on Blood-vessels.*

The various traumatic aneurysms were the most interesting cases but they did not reach us in sufficient numbers to enable us to draw definite conclusions as to lines of treatment. By far the common-
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The rest of operations connected with the vascular system were those for the control of secondary haemorrhage. These haemorrhages were, I suppose, the terror of all surgeons in the war; certainly they were mine. Occasionally with previous warning of a slight blood-stained discharge, but often without any warning at all, there would suddenly occur a tremendous rush of blood from a wound, soaking the patient's clothes and his bed. That so very few of these cases were fatal was due entirely to the promptness and efficiency of the sisters in charge of our wards. Practically all the cases were serious and many of them critical, yet we had only one directly fatal result, a case of bleeding from the common femoral artery. One of the most frequent and troublesome sources of haemorrhage was the gluteal artery and its branches. Details of a single severe case of this will illustrate some of the difficulties of the problem better than any other description I can give. A young man was admitted to one of my wards suffering from a shrapnel wound of the left buttock. The piece of shrapnel had been removed in France, a sinus led down towards the sciatic notch, the wound was slightly septic and the man's temperature somewhat irregular. The next day I was called suddenly to the case on account of haemorrhage. By the time I reached the man the haemorrhage was well under control; the wound being firmly packed with gauze plugs. The following day, an attempt to remove the plugs was followed by fresh bleeding. I had the man brought to the theatre and explored the wound. The condition found was as follows:—a septic sinus led down to the sciatic notch; just above the notch there was a hole in the bone through which the piece of shrapnel had passed; the haemorrhage came from well inside the notch, was arterial, and very severe. It could not be efficiently controlled with plugging. The bleeding evidently came from damaged gluteal vessels and these could only be reached by removing the edge of the sciatic notch, during which operation it would have been impossible to control the haemorrhage. The wound was rapidly and very firmly packed and the patient turned over on his back, an abdominal incision made and the internal iliac artery isolated and ligatured. Again the man was placed in his original position and the plugs removed. The bleeding was then found to be greatly reduced but not by any means entirely stopped, venous blood welling steadily up into the wound; evidently the gluteal vein as well as the artery had been damaged. Happily, this bleeding was quite easily controlled by plugs, so the wound was plugged and the patient sent back to bed. The following day the patient was dressed under an anaesthetic but bleeding recommenced and firm plugs had to be again inserted.
This line of treatment had to be followed for more than a fortnight, the patient being daily dressed under a general anaesthetic. The bleeding then ceased and the patient gradually picked up strength. He left the hospital quite healed and walking well.

Operations on Nerves.

My paper has spread itself out longer than I had intended but I cannot close without some reference to operations on nerves. This was easily the most fascinating of all the work of a war hospital, with the possible exception of tendon transplantation. For myself it was entirely new work and one's technique improved enormously before the work ended. Also one gave up some of the fancy operations of nerve anastomosis and implantation and the joining up of nerves with vein sleeves, etc., none of these being really successful, at any rate not under the circumstances in which we were placed. Finally, one came to the conclusion, borne out by other surgeons, that satisfactory results could only be expected if the ends of the nerve could be brought together and that without undue tension. In practically all cases we transplanted the nerve after suture to some fresh fascial plane or pulled over a piece of tissue to separate the nerve from the old scar. Cargill membrane we very early abandoned. I do not think it ever did any harm, but it was definitely a foreign body not easily absorbed and so added to the risks of operation. In one case seen by me, after the wound had apparently completely healed by primary union and remained so for a fortnight, a small watery blister formed at one end of the scar and a corner of the piece of Cargill membrane appeared there. On pulling it the whole piece came away. The wound happily remained aseptic and the case did well. Unfortunately, it was impossible to follow up these cases for more than a limited period and we are unable to say in what proportion of them there was anything like full recovery. The most satisfactory cases, as far as we saw them, were those in which the external popliteal nerve was involved. I know of two cases of suture of the nerve where the men were able to return to work in France. The reason for this good result was, I believe, that in this position by the fitting of a toe-raising spring the patient could be kept on his feet practically all the time, the muscles generally of the limb were kept moving, and little wasting from want of use ensued. One of the most striking features was the variability in time in which reaction reappeared in a divided and sutured nerve; in a few, reaction began to return in a few weeks; in others it would be many months and there seemed to be no accounting for this variation. In some cases, at any rate, the results were most
satisfactory. A man was admitted to one of my wards with a shattered elbow joint, the olecranon and inner condyle being blown away and the ulnar nerve completely severed. Some time after healing of the wound was complete, I excised the elbow joint, found the ends of the nerve, shifted the nerve to the front of the elbow to avoid tension and sutured the nerve. I happened to meet the man in a train about a year later. The movements at the elbow were fairly satisfactory, all anaesthesia had disappeared from the fingers, the movements of which were perfect, and the hand had regained its shape. Indeed, it was difficult to believe that the nerve had ever been affected.

Causalgia.

Of all the trying cases with which we had to deal there were none more obstinate and distressing than the cases of causalgia and these were, unfortunately, rather common. Causalgia was a word, let alone a disease, that I had never come across before I joined the army. It implies a neuralgic pain at the site of the distribution of a nerve due to an incomplete lesion of the trunk of the nerve. Generally speaking, the slighter the lesion, the more severe the pain. For example, I operated on one man with slight causalgia in the foot and removed a ragged piece of shrapnel imbedded in the great sciatic nerve; the pain was cured. I operated on another man with severe median causalgia of the hand and removed a small piece of shrapnel that was lying against the trunk of the median nerve which appeared uninjured. The man recovered but only slowly. The worst cases were those in which the nerve was apparently uninjured but was involved in the scar tissue of a wound. Functional paralysis of such a nerve would appear in some cases with little or no pain, while in others there would be, at first at least, little motor involvement but excruciating pain. The cases were particularly bad in men who seemed to be of neurotic temperament, but there was no question about the pain. In the daytime they would escape whenever possible to the bath-room and keep the hand for hours in cold running water or cover it with wet cloths until it was sodden. Only in some cases did operation and freeing the nerve from the scar give permanent relief. In others, with the lapse of time, the pain would get easier and functional recovery would ensue. In a few, the constant pain seemed to lead them to the borderland of insanity, though one was probably right in supposing that these were men with some hereditary nervous weakness. In one case, to preserve the man’s mental condition, I was compelled to divide the trunk of the median nerve in the arm. I sutured the nerve at the same
operation after dividing it. The immediate result was that the man completely regained his normal balance, though what happened to him when impulses again began to travel up and down the nerve I do not know. But the strangest case of all was one related to me by a distinguished surgeon. He had recently divided the median nerve for causalgia in an officer whose mental balance seemed likely to be upset by the continual extreme pain. A few days later the officer confessed that all pain had ceased from the time of the operation, but he was afraid that it was starting in the other (uninjured) arm!

In closing, I humbly apologize for the length of this paper and for my inability to present it in person to the meeting.

LETHARGIC ENCEPHALITIS IN CANTON.*

WM. W. CADBURY, M.D., Canton.

Early in 1917 a strange disease appeared in Europe characterized by profound somnolence. Economo, of Vienna, first applied the term lethargic encephalitis to it; perhaps a better name is epidemic encephalitis. A similar syndrome was described during the influenza epidemic of 1890 and was spoken of as nona. Many other names have recently been applied.

Cases appeared in England in 1918 and by autumn were reported from the United States. The disease has been well described in various medical publications during the last two years (Medical Annual, 1919; Journ. Amer. Med. Assoc., Vol. lxxii, p. 794, etc.) The etiology remains obscure except that there appears to be a definite association of the disease with influenza. As to its incidence, age and sex seem to have little influence.

Pathologically, minute hemorrhagic areas are found scattered irregularly in the brain. Spinal puncture has revealed nothing characteristic in the spinal fluid.

The symptoms of the disease include drowsiness or stupor, from which, however, the patient can be aroused. There may be restlessness and more or less purposeful movements. Headache, vertigo, and vomiting may be present. Local symptoms showing involvement of the intrinsic and extrinsic ocular muscles are common. There is a distinct preference for motor as opposed to sensory cranial nerve nuclei. There is no characteristic change in the reflexes.

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The disease may end fatally in a few days from the onset or it may be prolonged for weeks or months. Mortality is reported to be 25% to 50%. There is no specific treatment.

The following case, observed in the Canton Hospital, presented many of the phenomena of the disease described in the literature, and I consider it was a typical case of lethargic encephalitis. So far no other case in China has come to my notice.

Hist. No. 19-425, K.S.C., male, aged 7 years, Chinese, resident of Kwangtung Province. Admitted to the Canton Hospital, March 21, 1919.

Family history: Parents living and well. No disease of importance in family. Previous history negative.

Present illness: About one month ago some deafness of the left ear was noted. Fifteen days ago he developed fever with slight cough. There was pain in the left arm and in the throat. Four days ago the patient became restless with constant movements of the legs and arms. There has been slight hemoptysis. Two nights ago patient became stuporous. Good appetite.

Physical examination: The patient is constantly moving his arms and legs, the movements being choreiform in type. The tongue is constantly being protruded. In spite of the movements the child is evidently very drowsy. There is marked flattening of the naso-labial fold on the right side of the face and there is ptosis of eyelid. The patient acts at times as though he saw visions. Examination of the heart, lungs, and abdomen negative. There is no Kernig's sign and no rigidity of the neck.

Urine. Color, yellow; reaction, acid; sp. gr. 1.004; no albumen and no glucose.

Feces. Ova of ascaris.

Following an enema five ascaris worms were passed, after which fecal examinations were negative. In reaching a diagnosis the following conditions were thought of: (1) chorea; (2) acidosis; (3) tumor of brain.

Chloral was given per rectum to control the movements, which ceased two days after admission; sodium bromide was also given for a day or two, and sodium bicarbonate by rectum till the urine became alkaline when it was continued by mouth.

On March 27 Dr. C. A. Hayes reported that both pupils were equal. In the left ear was impacted cerumen. He concluded that there was no evidence of a cerebral tumor.
The temperature ran an irregular course for five days, varying from 38°C. to 39.2°C. From the 26th of March to the time of patient's discharge on April 7 there was practically no fever. The pulse, which was at first 100 to 115, dropped to an average of about 85. The rate of respiration was about 20.

The child left hospital on April 7. There was slight weakness of the left arm, but it was better than it had been. The head tended to rotate to the left, and the naso-labial fold on the left was still flattened. There was no tendency to choreiform movements and the drowsiness was much less pronounced.

On April 21, the temperature was 38.5°C. and the drowsiness was much more pronounced.

On April 22, he was again admitted to the hospital and remained for five days. The temperature remained normal, the pulse averaged 90, and the respirations, 20. The urine and feces were normal. Sodium bicarbonate was given by rectal drip and by mouth, but he became progressively more drowsy. With effort, however, he could be aroused and would speak rationally.

The patient was removed and put under the care of a Chinese doctor. On June 13 he again came to the dispensary. After leaving the hospital on April 26, the drowsiness gradually disappeared. He sleeps more now than is usual with most children, but is awake the greater part of the day.

The diagnosis of this case is based on the fact that it occurred when influenza was still present in Canton; on the profound sleepiness, with no sign of tumor of the brain or of meningitis; on the early choreiform movements; the unilateral palsy of the face; the slight fever, and the ultimate recovery. The symptoms coincide with many of those ascribed to lethargic encephalitis, and the picture coincides with that of no other disease.

ENCEPHALITIS LETHARGICA IN HWAIYUAN.*

HERBERT A. JUDSON, M.D., Hwaiyuan.

Lethargic encephalitis is of interest chiefly because it has so recently been described as a distinct disease entity, and because so little is known of its etiology and epidemiology. It first appeared in Austria in the winter of 1916 and has gradually spread westward through the European countries and British Isles, the United States, and has now

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evidently reached China. Following is a report of two cases treated in Hope Hospital this spring.

CASE I. Male, aged 26, day laborer.

Previous history. The patient had always been well and strong and was in good general health before the present illness began.

Present illness. About March 10, 1920, the patient began to see double and his people, thinking him possessed by an evil spirit, sent him to a native eye doctor, who treated him for a week without improvement. During this week he had no symptoms except a slight dizziness and the double vision. On March 18, he suddenly became weak and faint and had to go to bed. He said he felt very tired and that he could not open his eyes. From that time until recovery he remembers nothing. From his family we learn that after going to bed he lay as one asleep, without movement and without delirium. On March 19, retention of urine set in and it was this complication that brought him to the hospital the next day.

Physical examination. The patient lay flat on his back, hands folded across his abdomen, eyes closed, and face mask-like in its lack of expression. He was perfectly quiet with no muscular twitchings nor muttering. He awakened when spoken to, partly opened his eyes, recognized people, and answered questions with a fair degree of intelligence. There was partial bilateral ptosis and both pupils were much contracted. No nystagmus. There was no diplopia at this time. No definite paralysis of facial muscles. Tendon reflexes normal. The neck and limbs offered strong resistance to passive motion, and he would maintain any awkward position his arms or legs were put into until the muscles tired. Heart and lungs negative. Temperature 101°F. Pulse, 88. Respiration, 24.

Laboratory tests. Urine: no sugar, albumin, or casts. Blood: leucocytes, 10,500; blood pressure: systolic 110, diastolic 80 Spinal fluid clear, normal pressure, 70 cells per c. mm. Wassermann test, negative. Spinal puncture repeated March 25, showed 60 cells, and on April 5, 20 cells per c. mm.

Clinical course. The lethargic stage, with waxy flexibility and without voluntary change of position, continued unabated for about two weeks, when the patient began to notice his surroundings a little and volunteer remarks. He was awakened to be fed four or five times a day and had no difficulty in swallowing. Dizziness was his only complaint. There was marked constipation during this time and catheterization had to be repeated until April 16. The temperature stayed between 100°F. and 101°F. for the first six days, then gradually
came to normal. The first day of normal temperature was the first day on which he showed signs of returning consciousness. He was discharged April 26, and when last seen was still generally weak and dizzy, but slowly regaining strength and showing no diplopia nor ptosis.

**Case 2.** Male, aged 18, student.

Previous history. There was no history of preceding illness and the patient was in his usual state of health until the onset of the present trouble.

Present illness. On April 9, the patient came to the out-patient clinic, stating that for the past two days he had not been able to see clearly. The examination at this time was negative. The next day he suddenly became faint and apparently unconscious. That night he was very delirious and restless. He entered the hospital the next day, April 11.

Physical examination. The patient was unconscious, with constant twitchings and jerkings of face and limbs and was markedly delirious. When called to and shaken he quieted down and was able to answer a few questions. There was almost complete bilateral ptosis so that the lids had to be held open to see the pupils, which were narrowly contracted. There was definite diplopia in both lateral visual fields. No stiffness of neck; Kernig's sign absent. No evidence of paralysis in face, arms, or legs. Knee jerks absent on both sides. No ankle clonus; Babinski's reflex, negative. Temperature, 102.6°F. Pulse, 84.

Laboratory tests. Urine: negative. Blood: leucocytes, 6,600; blood pressure: systolic, 120, diastolic, 85. Spinal fluid clear, pressure slightly increased, cell count 240 per c. mm. (The highest count we have seen recorded is 105.) Spinal puncture repeated on April 22 showed a slight increase of pressure; fluid clear, but accidental contamination with blood vitiated the cell count.

Clinical course. The patient remained in profound lethargy until his death on April 23. It was possible, however, to awaken him until a few hours before he died, and when awakened he showed fair intelligence and could recognize people. During his stay in the hospital he took food when urged to, and his restlessness and delirium quieted after a few days. There was incontinence of urine until three days before death, when retention set in. Knee jerks remained absent. A petechial rash appeared over chest and upper arms, with a few clear vesicles. The average pulse rate was 80. Temperature varied between 102°F.-104°F., until the day before he died, when it increased still further, reaching 109°F. (rectal) two hours before death. The
heart remained strong until just before the end, the pulse being only 120 with a temperature of 107°F.

COMMENT.

We wish to call attention to the following points:

1. The absence in each case of a previous attack of influenza and the apparently physically fit condition of the patients preceding the onset of the disease.

2. The rather abrupt onset of the lethargic stage in each case.

3. The proportionally low pulse rate during the febrile stage.

LETHARGIC ENCEPHALITIS IN PEKING.*

By WM. G. LENNOX, M.D.

In such an unusual disease as lethargic encephalitis it is important that record should be made of its appearance in various parts of the world. For this reason, the following case, the only one which has come under our observation, is reported.

The patient was a married Chinese, aged thirty-three years, a servant in a foreign family. He entered the hospital on December 26, 1919. At this time there was a mild recrudescence of influenza in Peking and two of the patient's fellow servants had been in our hospital with mild attacks of this disease.

The patient's initial symptoms (beginning twelve days before entrance) were those common in influenza, viz., cough, headache, aching of muscles, abdominal pain, nausea and vomiting. These symptoms lasted three days, after which he felt better; but on the day before entrance the anorexia and malaise returned.

Physical examination at time of admission was negative. Particular note was made of the absence of signs of meningitis. Urinary and faecal examinations, negative. White count, 7,750; hemoglobin, 85%. Wassermann test on blood serum, negative. Stained blood smear and blood culture, negative. Widal test, negative. His morning temperature was always subnormal; his afternoon temperature ranged from 100°F. to 101°F. for the first ten days, after which it fell to normal.

On the evening of his admission the patient was delirious, though temperature was only 99°F. In the morning he appeared normal. In

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the evening, he was drowsy and hard to arouse. Pupils were pinpoint in size and equal. Neck very slightly rigid. Reflexes normal.

From this time on, for about two weeks, he would appear bright and entirely himself in the morning, asking to go home on the plea that he was cured; but in the evening he would be so drowsy that he could with difficulty be aroused sufficiently to answer questions. He was so dull that his ears were examined and found normal, except for slight chronic catarrh.

On the fourth day of his stay in the hospital spinal puncture was done to rule out tuberculous meningitis. Pressure was 10 c.m. of water (lying position). Globulin, negative; cell count, 51 per c.mm. Wassermann test on spinal fluid, negative; sediment, negative for tubercle bacilli.

On the seventh day a second spinal puncture was done. Pressure, 14 c.m. water. Globulin +; cells, 20 per c.mm.; smear, negative for tubercle bacilli. A second Widal test was negative.

On the fourteenth day a third spinal fluid examination was made. Pressure, 9 c.m. water. Globulin, negative; cells, 35 per c.mm.

Though the patient's spinal fluid did not show evidence of increased irritation, the signs of central nervous system involvement increased. His pupils remained small and he showed slight lateral nystagmus on left lateral fixation. Three weeks after entrance and after his temperature had been normal for a week, he showed diplopia, athetoid movements, nystagmus and a continuance of his dizziness and asthenia. He was given tuberculin (O. T.) subcutaneously. He failed to react to 1, 3, or 5 mg., but his temperature went to 102°F. with 7 mg. His white count on discharge was 9,800.

Dr. J. H. Korns was the first to suggest the diagnosis of lethargic encephalitis. Because of the delirium and marked drowsiness, athetoid movements, nystagmus, diplopia, slight leucocytosis and spinal fluid pleocytosis, it is felt that the diagnosis is clear, the case falling in the second group of McNalty's classification (those showing third nerve paralysis and general disturbance of the central nervous system).

The patient left the hospital able to walk and talk freely and attempted to return to work. It was found, however, that he was apathetic and vacant-minded; he complained of dizziness and weakness and apparently was hopelessly unfit for work. After lying about idly for several weeks he was sent to the country for two months. He came back showing mental improvement, which continued to increase, until his employer felt that, except for being slower about his work, he had regained his former health. On May 4, 1920, three and one-half
months after his discharge, he was again taken into the hospital for examination. His reflexes were normal. His spinal fluid examination showed: cells, 0; Wassermann, negative; Globulin test, faintly positive.

SUMMARY.
This is the report of a case of lethargic encephalitis in a Chinese, occurring nearly a year after cases first appeared in the United States. The points of interest are that the lethargic encephalitis occurred after an attack of mild influenza, a disease which had attacked two of his fellow servants a short time before. The stupor was preceded by the occurrence of delirium. The lethargic condition was profound in the afternoon and evening, but it disappeared to a considerable extent during the morning. The spinal fluid cell count was increased (51-20-35) during the patient's stay. After 3½ months the cell count became normal, but globulin was present, and patient was just getting back to his health of four months before.

TETANUS NEONATORUM: A STUDY IN PROPHYLAXIS.*


My object in presenting this short paper to the Conference is two-fold: (1) to ascertain in the discussion which follows how far the occurrence of tetanus neonatorum is general, and how far it is confined in its incidence to certain districts and localities; (2) to suggest a simple means of prophylaxis which will save life and at the same time create an unsurpassed opportunity for instructing parents in infant hygiene.

In the earlier years (1909-1912) of my work in Ko T'oung Market, the center of an agricultural district some fifteen miles to the north of Canton city, I saw on an average one case of tetanus neonatorum every week and I noted that the disease was uniformly fatal. I remember a Chinese merchant bringing me his eighth child with the statement that each of the previous seven had died of this disease.

Information gleaned from patients in the hospital wards revealed the same wide-spread incidence of infant tetanus, or "lock-throat" disease, in our neighbourhood. Another common name for it in this locality is "seven-day wind," a title which throws interesting light on its incubation period. In 1913, my brother, Dr. E. W. Kirk, formed a
plan for combating the serious infant mortality caused by tetanus in our district. He prepared a short pamphlet which stated the cause and method of prevention of the disease. Parents were invited to send their newly-born infants to the hospital for prophylactic treatment within twenty-four hours of birth. A guarantee was given that no child so treated would develop tetanus.

*Method of Prophylaxis.*

When a child is brought to the hospital, first of all the stump of the umbilical cord and the surrounding area of skin is thoroughly saturated with tincture of iodine. The cord is then re-tied and re-cut proximal to the original ligature. The cut surface is again treated with tincture of iodine.

The cord in the majority of cases is found to have been treated with various native medicaments before admission of the child, although as the result of our propaganda this custom has latterly gone somewhat out of fashion. Various forms of powder ("sealing-umbilicus powder") are sold in the native medicine shops, while the soot of burned ginger-root, and the soot from the under-surface of the pan used for cooking rice, are also commonly used. In our treatment of the child no attempt is made to remove this powder with soap and water (which would diminish the penetrating power of the iodine) until the whole area has first been thoroughly treated with the tincture and allowed to dry. The child then receives its first bath, and the officiating nurse instructs the mother as to the cause of tetanus and how to avoid it by strict attention to cleanliness, the use of sterilized instruments to sever the cord at time of birth, and by the rejection of native powders to "seal the navel." Last, but by no means least, a copy of Dr. S. M. Woo's pamphlet on "Infant Hygiene" is given to the child's parent or to the attendant who brings the child, with instructions that the book should be read by the father or, should he be illiterate, that the contents should be read to him.

The child is brought to the out-patient department for a daily bath for a period of eight days. This is a period of observation as well as of further opportunity for instruction which is fully taken advantage of.

*Results of Preventive Measures.*

In the short time I have at my disposal I can only briefly outline some of the results of this small effort in preventive medicine carried out in an up-country hospital during the past five years. I have collected the statistics of 550 infants who were brought to the out-
patient department during this period either suffering from tetanus, or because the parents feared tetanus. These cases did not include those seen in connection with the maternity work of the hospital.

**Table showing incidence of Tetanus in Chinese Infants, Canton.**

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Infants</th>
<th>Tetanus Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1915</td>
<td>89</td>
<td>30 = 33.7%</td>
</tr>
<tr>
<td>1916</td>
<td>93</td>
<td>22 = 23.6%</td>
</tr>
<tr>
<td>1917</td>
<td>99</td>
<td>18 = 18.1%</td>
</tr>
<tr>
<td>1918</td>
<td>135</td>
<td>17 = 12.5%</td>
</tr>
<tr>
<td>1919</td>
<td>134</td>
<td>7 = 5.2%</td>
</tr>
<tr>
<td>Total, 550</td>
<td></td>
<td>94 = 17%</td>
</tr>
</tbody>
</table>

In 1915, only 28% of the infants brought to us came within 24 hours of birth; in 1919, 63% were brought to us within 24 hours of birth.

Of the 550 infants treated, 293 were brought to us within 24 hours of birth and not one single case of tetanus occurred in this class.

A glance at the foregoing Table will show the steady rise in the number of infants brought to us, and the steady fall in the incidence of tetanus treated in the out-patient department.

**Incubation Period of Tetanus.**

Of the 94 cases of tetanus which were noted, the average incubation period was seven days.

The shortest period was three days (72 hours); the longest, ten days. One case, to which prophylactic treatment was given 35 hours after birth, developed tetanus on the 8th day. It will thus be seen that 48 hours or even 36 hours is too long an interval of delay if prevention is to be certain.

**Source of Infection.**

The commonest source of infection is undoubtedly the instrument used to sever the cord at time of birth. Another source, probably, is the native powder used "to seal the umbilicus," but I have conclusive proof that children upon whom such powder has never been used may develop tetanus.

It may be of interest to mention some of the instruments used in our locality for severing the umbilical cord. In 309 cases the nature of this instrument was ascertained. Scissors were used in 170 cases, and in 100 a broken piece of porcelain or earthenware pottery was used.
Tetanus Due to Ear Infection.

In such circumstances a rice-bowl, plate, or teacup is deliberately thrown upon the floor and one of the broken fragments used to sever the cord. In 23 cases a reaping-hook was used, and in 13 an ordinary knife. In one case a mussel-shell was used, and in one other the cord was bitten through by the child's mother.

Of the 550 infants brought to us for treatment 384 (69.8%) were males. This majority may indicate a relative preponderance of the male sex in the local birth-rate; or, on the other hand, it may only suggest that in our part of the country boys are considered to be of more value than their little sisters.

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TETANUS DUE TO EAR INFECTION.


In China it is the custom for barbers to remove polypi or wax from the ears. Owing to ignorance, carelessness, and the dirty instruments used serious results not infrequently follow this practice (vide CH. MED. JOURN., 1918, p. 158). In the particular case here reported, tetanus was the result.

The patient, Chinese, aged 23, a carpenter's apprentice, came to this hospital on February 11, 1920, complaining of being unable to fully open his mouth and of his right temporo-mandibular joint being stiff. He said that a month previous to the date of his coming a barber had scraped his ear.

On examination a large mass of polypi was seen in the external auditory meatus. In order to do the caloric reaction, I cut one large polypus near its base with a snare. I told the patient I would do a mastoid operation on the following day. Eight days later the patient returned and then I recognized he had tetanus. The patient could not open his mouth, so he was unable to protrude his tongue. The angles of the mouth were drawn out, causing the risus sardonicus. The muscles of his neck and back were stiff and his back was slightly arched. His abdominal muscles were rigid. The only focus of infection was the ear. There was no anti-tetanic serum in the hospital, so I performed a radical mastoid operation without giving, what war experience has shown to be necessary, a dose of serum before operation. Immediately after the operation the patient had a violent spasm, his body assuming the opisthotonous position. Later in the day he had two similar spasms and had difficulty in micturition. These spasms were relieved by morphia.
Three days after the operation, through the kindness of Dr. Kuno, of the Japanese Medical School in Moukden, I obtained anti-tetanus serum. I injected 150 units (15 mils) intraspinally and 250 units (25 mils) subcutaneously and seven days later I repeated the injections, giving 200 units intraspinally and 200 units subcutaneously.

After the first injections the patient experienced abdominal discomfort, the rigidity of the abdominal muscles having increased. He also complained of difficulty in breathing. After the second injection his temperature rose to 102°F., but fell to normal on the third day.

After these injections the patient's condition rapidly improved and his convalescence was uneventful.

COMMENT.

The points of interest in this case are:
1. The long period of incubation, one month.
2. The point of origin of the infection, the tympanum.
3. The source of the infection, the instrument of a Chinese barber.
4. The increased intensity of the symptoms following the operation.
5. The ease with which the infection yielded to operative and serum treatment.

A CASE OF CYSTIC DISEASE OF THE FIBULA.

W. CHALMERS DALRYM, M.B., B. Sc., Wukingfu.

The literature of cystic and fibrocystic disease of the long bones is comparatively recent. There is a summary of it in an instructive paper by H. W. Meyerding (Collected Papers of the Mayo Clinic, Vol. x, 1918). Virchow, in 1876, described a cyst of the humerus and ascribed its formation to liquefaction of a chondroma, a view which was then generally accepted and is still given a place in classifications known by his name. Rindfleisch, in 1886, and Hirschberg, in 1889, described cysts occurring in osteomalacia. Von Recklinghausen, in 1891, described general osteitis fibrosa cystica of the long bones and the pathologic changes associated therewith (von Recklinghausen's cystic degeneration of the long bones). Beck, in 1901, described two cases of cystic disease of the tibia which he believed were due to trauma. Muller, in 1906, and Pfeiffer in 1907, reported 43 and 49 cases respectively. Bloodgood, Beck, Silver, Freiberg, Murphy, and Percy are among the American writers on the subject. Bloodgood reviewed 69 cases in 1910. Silver reviewed 97 cases in 1911, and
reported a case of cyst in the femur of a boy aged four years, who was cured after a second operation. Elmslie has published two most interesting papers, the later one, in 1914, being a thorough review and study with case reports. Lotsch's monograph of 127 pages, in 1916, is a thorough study of the general fibrocystic types. It is to be remembered that the radiograph has been a most useful aid in the diagnosis of, and the differentiation between, single and multiple cystic disease. Heineke, in 1903, reported its use in his cases; previous to that time most material was reported from necropsy findings. Cysts frequently are discovered only after fracture, and the radiograph, as commonly used to-day, aids materially in the early diagnosis.

As Meyerding observes, the etiology of fibrocystic formation is obscure, the general fibrocystic types remaining unsolved. The theory of trauma is most generally accepted, but there are reasons for believing infections to be the etiologic factor. The theory of inflammation has many adherents and culture material gathered in the future should be given thorough study.

The following case, which came under my own care, is herewith reported.

A Chinese farmer, aged 32, married and has two children, alive and healthy. Father still alive; said to "have been cured of a large spleen." Patient gives no history of syphilis, tuberculosis, or rheumatism, and does not smoke or drink.

In April 1917, he was carrying a beam, when he fell, and the beam fell across his right leg hitting it on the outer side below the knee. Some swelling followed, and the leg did not return to its normal size. At times the swelling was painful, but the man was still able to carry burdens.

In June 1919, he was struck in the same place by a plough. The leg became more swollen and he was now unable to walk. He consulted native doctors, and, among other forms of treatment, the swelling was needled and black blood came out, but all forms of treatment were ineffectual.

On September 26, 1919, as I was returning from a trip to the country, I found the man waiting to see me in one of our chapels. I examined his leg, and found that on the outer side there was a large swelling, extending from just below the knee, which was not involved, to about the middle of the calf, most marked over the outer aspect of the leg, hard and painful on pressure. The whole leg from knee to toes was swollen and oedematous and somewhat hotter than the other side. No fluctuation could be made out, but there was pitting on
pressure. A suspicion of egg-shell crackling could be elicited. There was no general disturbance and no glands could be palpated in the groin or elsewhere. I thought it might probably be a case of bone cyst and advised him to come to hospital at once and have it operated on. He came in on September 29, 1919. The general and local conditions were unaltered. He complained that he could not get the leg comfortable in any position.

He was operated upon on October 1, under chloroform. A long incision was made over the centre of the swelling, extending from the region of the head of the fibula to the middle of the calf. The tissues were divided straight down till the tumour was reached, the outer wall of which was found to consist of a very thin plate of bone, about as thick as a sheet of stiff brown paper. This was cut through and inside was found a mass of undifferentiated tissue, somewhat resembling sarcomatous tissue. This was all removed with the finger and then the expanded bone was curetted away till normal tissue was reached. The resulting cavity was thoroughly rubbed with a bismuth and iodoform paste, packed with gauze, and partly sewn up. When all the diseased tissues had been removed there was a gap in the shaft of the fibula about three inches long, the upper and lower ends of the bone were plainly seen, the surfaces being transverse, with an abrupt termination where the disease had involved the bone.

The patient had an attack of malaria a week after the operation, but otherwise made a gradual, though somewhat prolonged recovery, the cavity taking a long time to granulate up, and fragments of the paste being discharged now and again. He left hospital at the end of December, able to walk, though still very lame. He complained that his toes were numb, though the muscles appeared to be unaffected.

Unfortunately, we have no X-Ray apparatus and so there was no opportunity to get a skiagram of the condition before operation.

COMMENT.

The case seems worthy of record owing to the comparative rarity of the condition. As already stated the pathology is still quite uncertain. Warren Low (Index of Treatment) says that some cysts of bone appear to be new growths which have undergone degenerative changes, while others are undoubtedly of inflammatory origin and represent an osteomyelitis due to organisms of a low degree of virulence. Treatment varies according to the view taken of the nature of the condition. If considered to be due to chronic inflammation, emptying of the cyst, scraping out of the lining membrane, and filling with Bipp
would be sufficient. If viewed as a new growth, the portion of bone in which the cyst is situated should be excised and replaced by a rod of ivory or a bone graft.

In Keen’s Surgery, Vol. VI, there is a short article on "Pathologic Fractures from Bone Cysts," which states: "During recent years a number of spontaneous or pathologic fractures have occurred as a result of the development of a bone cyst in the shaft of the long bones. The cyst may be single or there may be many. No bone is specially exempt from invasion. There is a difference of opinion as to pathogenesis. Most writers say it is due to a low grade of inflammation, ‘Osteitis Fibrosa,’ somewhat allied to osteomalacia and rickets, and resulting in the formation of a large cyst-like cavity in the shaft of long bones. The shaft of the bone is greatly expanded as a result of the presence of the cyst, the cortex being specially thin, so that fracture readily occurs.

"Some say the cyst results from the softening of sarcomata or chondromata, but this is not true in most cases. The X-ray appearance is characteristic. The cortex is about as thin as tissue paper. The medulla, instead of showing a relatively dark shadow, is exceedingly clear, and often shows trabeculae in the wall of the cyst. The treatment is surgical: thorough drainage of the cyst with evacuation of the contents. Some have got good results by filling the cavity with salt solution. After thorough curettage, fill with salt solution or bismuth paste, and then treat as a simple fracture."

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**NOTE ON BIER’S REGIONAL VENOUS ANÆSTHESIA.**

H. B. TAYLOR, M.D., Anking.

Perhaps most of the members of the Conference are familiar with Bier’s method of local anaesthesia and have used it constantly. However, I venture to bring it to your notice, hoping that it may be of use to some who are unfamiliar with the method, as I was myself until quite recently.

Some years ago, at a medical meeting in Kuling, Dr. W. W. Peter, in the discussion of a paper on local anaesthesia, remarked that the injection of a solution of novocain into one of the veins of an extremity would anaesthetize the whole extremity. The fact impressed me and my mind recurred to it often, but as I knew little about the technique I did not venture to try it.

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*A paper read before the C. M. M. A. Conference held in Peking, February 1920.*
Not long ago while looking up a subject in Keen's Surgery I stumbled on his account of this method of local anaesthesia. Briefly the technique, as described by Keen, is as follows.

The limb is rendered as nearly bloodless as possible by an Esmarch rubber bandage carried as high up as necessary. A thinner rubber bandage or ordinary tourniquet is then applied, or the limb is elevated for several minutes before applying the tourniquet. Several inches below this proximal tourniquet, or below the lower limit of the operative field, a second rubber bandage or tourniquet is applied. Under local anaesthesia a vein is then exposed between the tourniquets but nearer to the proximal one. For the arm the basilic vein is most frequently used; for the leg, the internal saphenous vein. The vein is opened and a blunt canula is inserted toward the hand or foot. It is important to use a blunt canula, as if a needle is used it is very easy to puncture the collapsed vein and the solution will escape into the tissues.

The solution used is 1:200 procain in normal saline solution and 20-60 mls are injected, the amount depending on the size of the limb or area to be anaesthetized. "Direct" anaesthesia between the two tourniquets follows in five or six minutes, and "indirect" anaesthesia follows below the peripheral tourniquet from six to twenty minutes later, when the peripheral tourniquet can be removed and any operation below the proximal tourniquet done painlessly.

Keen states that there is usually some motor paralysis in the anaesthetic area, but I have not noticed it in the few cases in which I have tried the method. In any case the motor paralysis disappears at once, and sensibility returns very quickly in from 2½ to 7 minutes after removal of the tourniquet.
The brief anaesthesia makes it necessary in amputations to work quickly with hemostasis and suturing, and I have found it advisable to place sutures of the skin and sometimes muscle sutures before releasing the tourniquet. I should think the anaesthesia would be prolonged by adding adrenalin to the procain solution, though I have not tried it.

I have used this method of anaesthesia with great satisfaction in five cases; two amputations of the leg, one amputation of the forearm, an extensive resection of tarsus and metatarsus for tuberculosis, and a plastic operation on the meatus urinarius. The last mentioned operation was urgently indicated on an extremely nervous opium smoker in bad physical condition. General and infiltration anaesthesia were contraindicated, while this method worked admirably. Of course only one constrictor was applied. Five mils of procain solution were required.

I can strongly recommend the method as the anaesthesia of choice in major operations on the extremities in all cases in which general anaesthesia seems in the slightest degree contraindicated.

RUPTURE OF ABSCESS OF LIVER: REPORT OF CASE.

ROBERT E. BROWN, M.D., Wuhu.

The patient was a Chinese miner, aged thirty-five. He was brought to the hospital with severe amœbic dysentery and loss of bowel control. He was passing a great many stools daily, but the lack of control made it difficult to obtain an accurate record of the frequency of the discharges.

The history was that of dysentery which started two months previous to his entrance in the hospital.

Examination showed a moderate degree of emaciation and both legs were swelled. There were no other significant findings. The patient complained of no tender spots or of deep tenderness in the liver region. There was no abnormal temperature. He was given emetine, gr. ½ t.i.d., by hypodermic injection, also a bismuth dysentery mixture by mouth three
times daily. On the third day his condition was much improved. The bowel movements had dropped to two or three per diem, and he was quite comfortable. The oedema of the legs was nearly gone. There had been no fever at any time.

On the sixth day, the patient complained of a slight pain in the right side near the eighth rib. The next day there was slight oedema of the skin in the mid-axillary line in the region of the eighth rib. There was also tenderness. By the ninth day the oedema of the skin had extended upward to the axilla and intra-clavicular region. The right side of the face was also swollen and puffy. The right pupil was dilated and the patient's voice was lost, evidently due to pressure paralysis. Respirations were somewhat labored. The pain had gone and there was still no rise of temperature. However, his general condition seemed to have become worse. A ruptured liver abscess was suspected, so a trocar was inserted into the pleural cavity and a large amount of greenish-yellow pus was drawn off. The same afternoon the patient was taken to the operating room with a view to draining the chest under local anaesthesia, but his condition would not permit this to be done. In the evening his respirations became more labored and he died during the night.

A partial autopsy was performed through an incision following the insertion of the diaphragm on the right side. The diaphragm was perforated one inch inwards from the point of insertion on the rib and in the anterior axillary line. This perforation opened into a large abscess cavity in the right lobe of the liver. It was very difficult to remove the liver owing to dense adhesions to the diaphragm. On removal, another abscess, which had not ruptured, was found in the same lobe. This one was smaller. The large one could hold about one pint of fluid. The abscess wall was very fibrous and tough. The inside consisted of rough, gray, necrotic tissue. The contents were rather viscid and of greenish-yellow color. The liver on section showed no other points of infection that were visible to the eye. There was also very little inflammation of the liver tissue adjacent to the abscesses.

Pulmonary Amebiasis.—In the Semana Médica, Buenos Aires, Dec. 1919, Bullrich summarizes various cases of nonsuppurating amebiasis in the lung, and describes in detail a case of his own. The patient, aged 43, had been clinically cured of dysentery with emetine six years before. Three years later, there was a tendency to diarrhea. Then came sudden pain in the shoulder with coughing and sensations of something tearing loose in the lung, with bloody sputum afterward. There was also pain in the lung and liver and some fever, and the stools became dysenteric, but no amebae could be found, no tubercle bacilli, and the Wassermann test was negative. Roentgenoscopy showed the apexes clear, but the right lung below cast a shadow, and the diaphragm was immovable. Under emetine, the temperature, stools, lung findings and general condition promptly returned to normal. Bullrich remarks in conclusion that the ameba probably invade the liver first, through the portal system. If they pass beyond the barrier of the liver, the lung is the next barrier they encounter.
BACILLUS PYOCYANEUS INFECTION: REPORT OF CASE.

EDGAR T. H. TSEN, M.D., (From the Bacteriological Laboratory of the Peking Union Medical College Hospital, Peking.)

When *B. pyocyaneus* was first isolated in pure culture by Gessard in 1882, it was generally considered to be a harmless saprophyte having a wide distribution in nature—in water, in street dust, on the skin and in many different parts of the body. Its association with pathologic changes was thought to be of no significance at all. Even when it was the only organism found in certain pathological lesions, its etiologic relationship to such was questioned. A few years later, however, several investigators, notably Charrin, found that this organism was not so harmless as it was generally believed to be, but was distinctly pathogenic for certain laboratory animals such as guinea-pigs and rabbits. Subcutaneous or intraperitoneal injections of one mill or more of a recent bouillon culture usually caused the death of the animal in from twelve to thirty-six hours. When smaller amounts were injected subcutaneously, the animal usually recovered after the formation of a local abscess. Still later this supposedly harmless organism was proved to be pathogenic not only for animals but also for human beings. Many reports have been published on human infections and small epidemics caused by it. Gruber, Martha, and many others have reported it as the cause of different kinds of localized inflammatory processes, and Barker, Calmette, Ehlers, Karlinsky, Kossel, Lartigau and a number of others have described it as the etiologic factor in various general febrile processes. In 1908, Cooley reported an epidemic of infantile diarrhoea caused by it. At present, infections by this organism are generally admitted to be possible; nevertheless, they are quite rare.

Through the courtesy of Dr. W. G. Lennox, I am permitted to report the following case.

The patient, a servant, thirty-three years old, was admitted to the medical ward of the Peking Union Medical College Hospital on January 6, 1920, complaining of cough, and of pain in joints of both shoulders and knees. His father died of typhoid fever; his mother, wife, two younger brothers and two daughters were living and well. He had typhoid fever and dysentery five years ago, gonorrhoea two years ago, and malaria last year. On December 2, 1919, he had a cold and then, after a bath, felt pain in the ankle, knee, and hip joints. The pain was
worse at night. There was also swelling of both feet and ankles, fever, slight cough, shortness of breath, and pain in the chest. He entered this hospital for treatment on December 16; improved under injections of typhoid vaccine, and left the hospital on December 23rd.

The present illness began on December 28—five days after he left this hospital—with another cold, followed by recurrence of the old trouble—pain and swelling of the joints, and cough.

On admission the patient was found to be emaciated and pale. The right side of chest was painful to the touch. The right lung showed dullness over lower lobe, diminished vocal fremitus, impaired breath sounds (distant breathing); there were no râles. The left lung was apparently normal. The heart sounds were weak; there was no murmur. The abdomen was soft and had no tenderness; the liver and spleen were not palpable; the inguinal glands were enlarged; the genitals showed no abnormalities. There was tenderness (and pain on motion) in both knee-joints, especially the left. The shoulder-joints were also tender, although to a lesser degree.

The patient's condition remained practically unchanged for twelve days. On January 19 he became stuporous and remained so until March 17, when he died. Autopsy was performed about fifty hours after death. With the exception of pulmonary tuberculosis, nothing characteristic was found.

Spinal fluid was always clear and contained no tubercle bacilli; there were only four cells per c. mm. The guinea-pig which was injected with this fluid showed no evidence of disease (tuberculous infection) during the six weeks it was kept under observation. The leucocyte count was 5,000 on January 7 and 26; 2,500 on February 29; and 3,600 on March 4. Wasserman reaction was negative.

**Bacteriological Examination.**—On January 25 the patient's blood was cultured, but it was found to be negative for typhoid and paratyphoid bacilli.

On March 8 a specimen of clear spinal fluid was obtained from the patient and put in an incubator. It contained only four cells per cubic millimeter. After two days' incubation at 37.5°C, it became blue and this coloration was found to be due to the growth of *B. pyocyaneus*. Thinking that the presence of this bacillus might be due to skin contamination, another specimen of spinal fluid was obtained, a few loopfuls of which were inoculated into a tube of broth, another few loopfuls into a tube of agar slant, and the remainder was left in the original tube. All the three tubes were then incubated at 37.5°C. On the next day, one blue colony had appeared on the agar slant
Bacillus Pyocyaneus Infection: Report of Case.

which was afterwards found to possess all the cultural characteristics of B. pyocyaneus. Both the original specimen of spinal fluid and the broth culture also turned blue after two days' incubation.

On March 13 a specimen of blood was obtained from the patient, half of which was cultured and the serum from the other half was used for macroscopic agglutination with the isolated B. pyocyaneus. The cultured blood gave a pure growth of B. pyocyaneus. The agglutination test was at first set up with five tubes, the first four of which contained the patient's serum in dilutions of 1-40, 1-80, 1-160 and 1-200, and the fifth tube contained serum from a normal person diluted 1-20. Agglutination occurred in the first four tubes and no reaction in the fifth control tube. The test was repeated with another specimen of serum from the patient, and this time agglutination occurred with the serum in a dilution of 1-640.

The heart blood at autopsy also gave a pure growth of B. pyocyaneus.

Bacteriological Diagnosis.—B. pyocyaneus septicæmia.

References.


Unclassified Tropical Fevers.—In the last edition (1919) of Castellani and Chalmers' "Manual of Tropical Medicine," the following are given as unclassified fevers of the tropics: Cobh's Pigmentary Fever, somewhat resembling a mild heat-stroke with pigmentation of the nose and cheeks; Robles' Fever, of British Honduras; Kwan's Fever, of Rangoon; Naegle's Urticarial Fever; Hyperpyrexial Fever; Double Continued Fever, of China; Low and High Intermittent Non-malarial Fevers; Missmann Fever, an epidemic glandular fever; Nasha Fever, of Bengal; Tentsing Fever, lasting from 10-14 days; Woolley's Fever with Jaundice; Macular Fever, of Tunisia; Tacamocho Fever, of South America; Kyoto Fever; Bau Bach, of Cochin China, a fever lasting from 5-8 weeks; Febris Palustris Remittens; Reiter's Disease; Ovulasia, of Annam; Hæmocystozoon Fever; Septic Bilious Fevers; Bungpaga, or myositis purulenta tropica; Robb's Heat Fever; Non-malarial Quarten Fever; Anæmic Low Fever; Venicular and Papular Fevers; Hæmorrhagic Febrile Gastro-enteritis of children.

Investigation into the unclassified "climatic fevers" of Cochin China has led the Pasteur Institute of Saigon to distinguish from the group one definite clinical entity in consideration of the fact that the organism isolated has shown the same general characteristics in every case. The symptoms differ in intensity only, but, according to the predominating clinical feature, the condition has been variously diagnosed as typhoid fever, typho-malaria, pseudo-dengue, five days' fever, extreme eastern and Indian port fever, an attack of malaria, or simply as gastric trouble a calore. In effect it appears to combine the symptoms of pseudo-dengue and of five days' and seven days' fever, though to regard it as a fusion of the three different clinical types in question would be premature. The name "astheno-hyalgic fever" is suggested as indicating its three essential characteristics. The condition seems to be endemic and to persist to a certain extent all the year round, assuming an epidemic form at intervals. In 1919 the periods of greatest severity occurred in June and August.—Bull. de la Soc. de Path. Exot., February, 1920.
The annual list of medical missionaries in all parts of the world holding British degrees has just been compiled. This year it contains 368: Missionaries. In January, 1914, the number was 451, so there is a decrease of 83. Of course during the great war many left their stations at the call of patriotism to serve at the Front, and some of these will never return. The inevitable decline in the number of medical students during the war has also reduced the number of immediately available candidates. We are not aware that a similar list has been compiled of American medical missionaries all over the world so as to enable a comparison to be made of their present strength with that presented before the war. It is safe to say, however, that it is still very difficult to obtain the full number of medical missionaries required to carry on and extend the work of American medical missions in China, notwithstanding the vast sums of money which have been raised for missionary purposes since the war.

Granted that there is a seeming decline in missionary zeal among all classes in the home lands, is there anything which has particularly affected the medical profession so as to cause fewer of its members to offer for the mission field? Some writers on medical missions say that the doctrine of evolution and the higher criticism of the Bible have had for years a disastrous influence on missionary interests and there is no sign of this influence passing away.
We hope this will not give the impression to the unfriendly critics of Christian missions that the medical missionaries now on the field ignore all the discoveries and advances of modern science based on careful research in many fields of knowledge; that they are still firm believers in Usher's chronology and therefore hold that man was made suddenly out of the dust about 6,000 years ago; and that a great and impassable gulf—physical, mental, and moral—has always existed between him and the rest of living creatures. We are sure that medical men in China holding these views are very few, and if less than forty years of age belong to the class of placid individuals who succeed in keeping science and religion shut off from one another in separate compartments, as it were, of the mind. Indeed, it is hard to see how religious, thoughtful, open-minded medical students can study the facts of comparative anatomy, embryology, physiology, anthropology, and other branches of medical science, and remain opposed to the doctrine of evolution, though this need not imply the acceptance of all Darwinian hypotheses or the acknowledgement that the last word has been said on the whole subject; nor should strong intelligent faith be disturbed by candid and reverent examination of the Scriptures in the light of the highest modern scholarship.

What a storm of religious controversy would have been raised half a century ago if an address had been given at a religious meeting at all similar to that made at our recent Medical Conference in Peking by Dr. Aleš Hrdlička on "The Anthropology of Asiatic Peoples," in which a member of the type known as *Pithecanthropus* is taken as the representative of human precursors who lived, it is roughly estimated, about one million years ago! We half expected that at least two or three correspondents would send to the JOURNAL indignant letters of protest. So far we have not received one. This may mean nothing more than that those who disagree prefer to suffer in silence. On the other hand, there are many medical missionaries in the field to-day who find no irreconcilable conflict between true religion and science, and we have come across no evidence proving they are one whit behind others in Christian faith, hope, love, and unselfish service.

The world has been terribly shaken by the great war, and religious beliefs, especially those which are traditionally orthodox,
have also been shaken. But the things which cannot be shaken will remain. For a time there may seem to be religious declension and missionary interests may suffer. In the May number of "China's Millions" it is said: "One of the distressing features of the present time is the few men candidates who apparently are devoting their lives to God's work in the foreign field." One explanation may be that there are many physicians and other workers full of Christian earnestness who desire to come to the foreign field, but who cannot conscientiously subscribe to the religious tests of times past. Viewed from this standpoint the situation is more hopeful. The religious differences of conscientious people are hard to overcome, but eventually there will be unity of faith and purpose and a great missionary movement forward.

During the very hot summer months all who are able to leave their work go to the hills or the seaside for rest and coolness. Many cannot get away, unfortunately, and in certain parts of China the dangerous effects of excessive heat can only be avoided by the exercise of the greatest care, especially at times when it is almost as hot at night as during the day.

There was a very instructive discussion on heat hyperpyrexia at a recent meeting of the Medical Society of London (Brit. Med. Jour., March 20, 1920). The opening paper, based upon the experiences of three summers in Mesopotamia, was by Dr. W. H. Willcox. Among the etiological factors mentioned as being present in Mesopotamia were the extreme flatness of the land with absence of trees and vegetation; the high atmospheric temperature; a succession of hot days; atmospheric humidity; stagnation of air; defective personal protection; racial susceptibility; insufficient supply of drinking water; undue exertion or alcohol taken during the heat of the day; constipation; any disease causing pyrexia. The symptoms, treatment, and prophylactic measures were described.

In the other opening paper, Dr. Leonard Hill, the physiologist, emphasized the extreme danger of enclosure and still air. Referring to the tragedy of the Black Hole of Calcutta, he said that the air entangled between the bodies and in the clothes of the victims became saturated with warm vapour and heated to body temperature, and thus heat-stroke, not suffocation, put an end to their sufferings.
So long as the sweating mechanism remains active and there is a breeze, there is no danger of heat-stroke. Cessation of sweating, generally coupled with increased micturition, usually precedes the rise of body temperature. The great thing is to recognize the danger of the dry skin and get treatment in time. Heat-stroke is not an infectious disease, but is more liable to occur in those whose vaso-motor mechanism is unstable, in the constipated, the drunken, the fatigued, or infected.

In the discussion which followed, Dr. Feiling, who had also served in Mesopotamia, said it was comparatively rare for previously healthy men to be affected with heat hyperpyrexia. It had generally been found that immediately before the hyperpyrexia the patient had had malaria, or had been out of sorts as a result of constipation or some other minor disorder. He did not regard the suppression of sweating as the cause of hyperpyrexia, but as the result. The spraying of the body with cold water and the use of electric fans was undoubtedly a desirable method of treatment, but in his experience it did not produce sweating at all. Dr. Cope suggested that the greater incidence of heat-stroke might be due to the fact that the British ate more meat than Arabs and Indians. He also thought the absence of sweating a symptom rather than a cause. Once while operating he found that the patient went off into a violent form of heat-stroke directly after the administration of the anaesthetic was begun; the anaesthetic was stopped at once, but the heat-stroke appeared to exaggerate and prolong the effect of what had already been given. Dr. Manson-Bahr referred to the difficulty of making a diagnosis between heat-stroke and pernicious malaria. In bringing the discussion to an end, Dr. Leonard Hill said that the most interesting point raised was whether the absence of sweating was a symptom or a precursor. The fact seemed to be that the sweating mechanism was not built to stand the extraordinary strain put upon it.

The medical profession is not so hopeful as it was a few years ago of the speedy conquest of tuberculosis. In a recent article (Jour. Amer. Med. Assoc., April 17, 1920,) James G. Cumming states that our efforts to control the disease by the restriction of
spitting and coughing have not given results that inspire a high degree of confidence; in his opinion the distribution of tuberculosis by the air route is of minor importance among adults. As the result of a long series of laboratory investigations he believes that infection is usually conveyed by saliva-contaminated inanimate objects, particularly eating utensils used by tuberculous patients, it being remembered that usually it is not the large dose of tubercle bacilli that is responsible for infection, but repeated small doses.

The plan of his laboratory investigations was (1) to determine the presence or absence of tubercle bacilli on eating utensils, after they were used by tuberculous patients, selecting the spoon as the most likely transmitting object; (2) to determine the presence or absence of these organisms on eating utensils after the utensils were washed by the usual hand method in hot water; (3) to determine the presence of tubercle bacilli on the hands of patients, and (4) to determine their presence in the air of tuberculosis wards.

In these experiments the spoons and other utensils were first washed by hand in hot water. They were then placed in a large-mouthed bottle containing 50 mils of hot water and shaken for five minutes. This rinse water was then centrifuged and the centrifugate injected into guinea-pigs.

**Results of Injections into Guinea-pigs.**

<table>
<thead>
<tr>
<th>Injections</th>
<th>Number Injected</th>
<th>Number Dead</th>
<th>Dead from Tuberculosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spoon wash water</td>
<td>31</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>Spoon rinse water</td>
<td>36</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Hand scrapings</td>
<td>7</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Air washing</td>
<td>11</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

The question is asked: "In view of the exchange of eating utensils in a family group, and in view of the fact that the majority of eating utensils are hand washed, by which method they are neither freed from all organisms nor rendered aseptic, and in addition, that the eating utensil is the most common inanimate object which enters the mouth of the tuberculous as well as that of the non-tuberculous, is it not obvious that the eating utensil is the major avenue of tuberculosis transmission?"

If the answer to this question is in the affirmative, then the danger among the Chinese of transmitting tuberculosis in this
manner must be very great. As described by Dr. Wu Lien-teh, "in an ordinary Chinese meal three things are absolutely necessary: a pair of chop-sticks, a spoon, and a bowl for rice. The spoon is plunged into the common bowl of soup, everyone helping himself and often making considerable noise. The chop-sticks are used for picking up solid food from dishes placed on the table, thrust deep into the mouth, then withdrawn. This process is repeated indefinitely. Among members of the same family this may not be harmful, but one often has to sit among total strangers, who may be suffering from syphilis of the mouth, foul teeth, tuberculosis, pyorrhoea, ulcers, and other diseases of the mouth." (Nat. Med. Jour. of China, November, 1915). Long established customs are difficult to change; but tuberculosis is so fearfully common among the Chinese that regard for their own health should induce them to serve and eat their food after the manner prescribed by Dr. Wu Lien-teh, and thus reduce the probability of transmitting infectious disease at meal times to a minimum.

At the Conference held in Peking last February, an address was given by a representative of the Board of Interior on "The Chinese Government and Dissection in China" (see CH. MED. JOURN., May 1920, p. 289). The speaker dwelt on the great difficulty of procuring bodies for dissection owing to the religious and other prejudices of the Chinese people. He went on to say, however, that in Peking there are many homeless and destitute people, and that possibly some of these in the course of time will furnish the material required.

In Great Britain the medical schools appear to be in the same difficulty as in China. In a very interesting letter in Medical Missions in China, the editor, in giving his medical experiences while on furlough, writes:

"A curious fact which I may mention is that in the medical schools, which are everywhere full to overflowing (in Glasgow hundreds of youths who wished to begin the study of medicine were refused admission to the University on account of lack of accommodation), there is no dissecting in connection with the classes of anatomy. The reason seems to be that the class of friendless, homeless, paupers from which the anatomical rooms used to be supplied has practically disappeared.
Everybody now gets a decent burial. This is a serious loss to the medical student, for the demonstrations that now take the place of dissecting are a poor substitute, and I was told that the teachers of anatomy were appealing to the Ministry of Health to help them out of their difficulty; but I suppose the Minister of Health may say that he is there to try to prevent pauperism and not to foster it. In former days I believe doctors sometimes bequeathed their bodies to the dissecting room, and it may again become advisable for patriotic citizens to do the same."

Naturally, medical men may be expected to take the lead in a matter of this kind as they are not only patriotic but are also devoted to science. Many of the patriotic laity will doubtless follow their example, so it is probable that in Great Britain the difficulty of procuring bodies for dissection will soon be overcome. But in China patriotism has not reached this high level. Officials as well as the common people need to be taught that the privileges and duties of patriotism are open to all, and that the greater the wealth a man derives from the state the more patriotic he should be. Hence wealthy officials should be foremost in patriotic service, especially as their example usually carries great weight with the people. What a wonderful change would soon be wrought in China if all officials became sincerely and unselfishly patriotic! For instance, if all the avaricious officials who are responsible for the political corruption and lawlessness which are now ruining the country could be made to see that in personally meeting the anatomical needs of Chinese medical schools—of course without improper haste—they would be rendering noble service to their country, what a benefit—but we must not raise hopes that may never be realized.

It should not be taken for granted that the Biennial Executive Conferences furnish the only occasions when members of the Association can bring forward business matters, air their grievances, if they have any, or make suggestions for accomplishing the objects of the Association more energetically or more wisely. The CHINA MEDICAL JOURNAL is always open to correspondents, and if the letters relate to the affairs of the Association the executive committee carefully considers them and does whatever is necessary in the interests of the Association. Further, the executive committee at its meetings is always ready to consider the proposals and suggestions of members directly sent.
to it. Early in October a full meeting of the executive will be held and it is hoped that all who have business to lay before the committee or suggestions to offer will communicate as soon as possible with the Executive Secretary.

REGIONAL MEDICAL CONFERENCES IN CHINA.

Henry S. Houghton, M.D., Peking.

Anyone who has attended, as the writer has done, the Conferences of the Association during the past fifteen years, will sympathize with the hope that in time these meetings may be held annually instead of biennially and that the number of those coming regularly to them may be even larger than the unusual attendance in Peking last February.

There are three particular ways in which these gatherings are of value to those of our membership who are able to be present.

(1) Professional.—The insight given into the more recent advances of the medical sciences, clarification of clinical problems through carefully prepared papers, and demonstrations of new diagnostic and laboratory methods, probably make the strongest appeal to the missionary physician who has been working in comparative professional isolation.

(2) Institutional.—The Association is made up largely of men and women who are serving not only as physicians, but in most cases also as hospital executives. Our organization is thus in a very real sense a hospital association, and in its meetings unusual opportunities offer for discussion of institutional problems peculiar to the Orient. The value of this phase of the Association's work was illustrated in the emphasis given to mission hospital administration in the program of the Peking meeting.

(3) Social.—The chance of renewing old friendships and of forming new ones is a feature of our conferences not to be held lightly. It is wholesome and uplifting to meet and mingle with others engaged in the type of work which claims one's own interest and enthusiasm.

It would be most desirable and helpful to have annual conferences of the Association. The rapid development of the whole field of medicine during the intensive activities evoked by the war, the extraordinary changes going on in many of the more highly specialized fields of the profession, appear to call for frequent meetings in order to keep ourselves scientifically fresh and alert. There are other important considerations: a new order of things in Christian institutional
work in China is appearing, particularly among mission hospitals located in the large centers, and the problems created in the adoption of these programs for intensive work call urgently for full discussion and the formulation of general policies of advance on the part of the Association as a whole. The place which the China Medical Missionary Association is beginning to take, moreover, in the councils of missionary societies as an authority in medical matters creates an obligation for faithful and regular participation of members in the Association's business.

It does not seem feasible at the present time to hold Conferences annually, the chief restrictions being the cost of travel and the time lost in journeying long distances to the meetings. The suggestion has been made, however, that during the interim years regional conferences might be held in the various principal geographical centers. One for north China, for instance, would naturally meet at Tsinanfu or Peking; for central China (including Fukien), Shanghai would be the obvious center, with perhaps another group meeting at Hankow or Changsha. In the south, Canton and Hongkong could alternate. The programs prepared for these regional conferences would have the advantage of being freed from the routine business which necessarily absorbs much time at the general meetings of the Association, and a series of special papers, demonstrations, clinics and open discussions could be arranged which would be inspiring and stimulating. The sectional conferences in general medicine, surgery, and other branches as held in Peking recently met with great favor and should constitute a special feature in the plan proposed. It is earnestly hoped that the suggestion above outlined, which has come independently from many members of the Association, will be acted upon energetically during the coming winter.

CHINESE GOVERNMENT HONORS MEDICAL MISSIONARIES.

Three British medical missionaries, Drs. Davenport, Cousland, and Gillison, have had the Order of the Chia Ho, 5th Class, bestowed upon them by the Chinese Government.

Dr. Cecil J. Davenport, of the London Missionary Society, was President of the China Medical Missionary Society during three of the critical years of the war, and recently presided at the Medical Conference held in Peking. He receives the Chia Ho for pioneer work in Chungking and Wuchang, and also for his present work since 1904.
as chief of the Shantung Road Hospital, the oldest British hospital in China. He has seen 31 years' service in China.

Dr. Philip B. Cousland, of the English Presbyterian Mission, was formerly at Chaochowfu, Fukien Province; he is now engaged in translating foreign medical books into Chinese and in helping to form a Chinese medical terminology, etc. The decoration is bestowed for long and useful service in pioneer medical and literary work extending over nearly 40 years in China.

Dr. Thomas Gillison, of the London Missionary Society, worked for nearly 35 years in Hankow, and is now doing teaching and literary work in the Shantung Christian University, Tsinan. He has been decorated for pioneer medical work which has had wide-reaching influence in Central China, and for successful medical education and literary work in Hankow and Tsinan.

A meeting of the Executive Committee was held in Shanghai on March 18, 1920. Present: Dr. Davenport, who presided, and Drs. Beebe, Houghton, McCracken, Merrins, and Morris.

The minutes of the meetings held in Peking on February 21 and 27, were read and approved, subject to confirmation by the members of the Executive Committee who were absent from these meetings.

The following resolution passed by the Peking Conference was presented for further consideration:

WHEREAS, There is a reference in the minutes of the Committee of Reference and Council which recently met in New Haven, U.S.A., to the fact that the Army and Navy Red Cross Societies have announced through an agency in Washington, D.C., that the hospital supplies of these societies will be available to mission hospitals and charitable institutions.

Resolved, That the Executive Committee appoint a committee of three members of the C.M.M.A. about to go home on furlough, to take up this question with the agency in Washington, and obtain some of these supplies for the mission hospitals of China, and

Be it further resolved, That those hospitals and institutions desiring to avail themselves of this opportunity report their desire to the committee and send in a complete list of their needs to the chairman of this committee.

In accordance with this Resolution, at its meeting on February 27, 1920, the Executive appointed the following committee: Dr. S. Cochran, chairman; Dr. J. G. Vaughan, and Dr. H. Balme.

The secretary reported that no cablegram had been sent as directed at that time. This decision was taken after consultation with Dr.
Beebe, who said that already steps had been taken in the U. S., by Dr. Vaughan in the interest of mission hospitals and that there would be a great difficulty due to the necessity of having the money ready to send when the supplies were ordered. The Executive approved and directed a letter on the subject to be sent to Dr. Cochran and to Dr. Vaughan. Dr. McCracken was delegated to act in this matter through the medium of the American Red Cross.

After some discussion the editor was authorised to publish in the next number of the China Medical Journal a notice in regard to the possibility of bringing out a special volume containing the entire proceedings of the Conference, the cost of the volume to subscribers to be $5.

As the minutes of the proceedings on the last day of the Conference had been referred to the Executive Committee for confirmation, a sub-committee consisting of Drs. Davenport and Morris was appointed to see the minutes were correct.

It was moved and carried that Dr. C. F. Johnson, the President of the C. M. M. A., be asked to serve as the representative of the Association at the 25th anniversary celebration of the Y. M. C. A.

A resolution from the Shanghai Branch of the C. M. M. A. recommending the establishment in Shanghai of a medical school under missionary control, was received by the Executive Committee. After considerable discussion it was moved and carried to refer this resolution back to the Shanghai Branch, asking it to refer the matter to the Council on Medical Education after collecting the facts necessary to the consideration of such a question.

There being no further business the meeting adjourned.

The next meeting of the Executive Committee was held on May 1, 1920.

The meeting was called to order at 9.30 a.m. by the President, Dr. C. F. Johnson, and was opened with prayer by him.

The other members present were:—Drs. Beebe, Davenport, Houghton, Merrins, McCracken, and Morris.

The minutes of the two meetings of February 21 and 27, having been circulated among the members who were not present and approved by them, were confirmed and signed.

The minutes of the meeting of the local members of the Executive Committee of March 18 were read and approved subject to confirmation by the other members.

The sub-committee appointed to correct the minutes of the last day of the Conference reported that the minutes had been corrected and they were accordingly approved.
In connection with the distribution of American Red Cross supplies, Dr. McCracken was instructed to draw up a general statement of the needs of the hospitals in China and to send it to the American Red Cross, Vladivostock, asking if it could give any definite idea as to the kind and quantity of the supplies it might be able to send. When an answer is received he is to find out the exact needs of the hospitals in China.

Later, Dr. F. P. Manget was introduced to the meeting and read a cablegram which had just been received from Maj. Charrette at Vladivostock, informing him that the Red Cross supplies which had been kept in Vladivostock were being shipped to Shanghai for distribution to the mission hospitals in China. A general list of the kinds of supplies was given in the cablegram. The hospitals which had sent medical men to Siberia in 1918 were to be the first ones to profit in the distribution. Arising from this, Drs. Beebe, McCracken, Davenport, and Manget were appointed a committee to take the matter in hand and to find out what the needs of the various hospitals were and to aid in the distribution accordingly.

At this point Dr. John A. Snell was invited to the meeting and presented the preliminary report of the Council on Hospital Administration, the chief feature of which was the report of the sub-committee on X-ray service, the prescribed duty of which is to prepare specifications for standard apparatus and assist members of the Association in the purchase and installation of apparatus, and in the training of X-ray operators. Drs. Snell, Hodges, and Ellis, the members of this sub-committee, reported as follows on its proposed methods of procedure:

1. The sub-committee is ready to act in an advisory capacity to any hospital wishing to install X-ray equipment.
2. To render any assistance possible in connection with X-ray difficulties any hospital may have.
3. To select what may be called a standard X-ray equipment for the small hospital, and be prepared to recommend any modifications necessary to meet the local conditions of any hospital.
4. To arrange for the advantageous purchasing of X-ray equipment and supplies.
5. To train X-ray technicians. (Dr. Hodges kindly offers to give men from any hospital sufficient training to do the technical X-ray work of a small hospital.)

The Executive Committee, in adopting the report, passed the following resolution, proposed by Dr. Davenport:

"That with the adoption of this report we recommend that the sub-committee endeavour to secure in England the same help and facilities in X-ray matters for British medical missionary hospitals as is being secured in America for American hospitals."
The committee consisting of Dr. Allen C. Hutcheson, of Nanking, Dr. John A. Snell, of Soochow, and Dr. George Hadden, of Changsha, appointed at the Conference to consider the financial standing and other affairs of the China Medical Journal, presented its report, Dr. Snell being present by invitation.

The committee reported that all the affairs of the Journal were in good condition and made certain recommendations of which the following are the principal:

1. That next year and thereafter the China Medical Journal be published monthly.
2. That the department of "Medical and Surgical Progress" of the Journal be strengthened by the appointment of departmental editors who shall be specialists in the departments assigned to them, and chosen from the centres of China where the facilities for medical research and access to medical literature can be more easily obtained, and where continuity of service can be more easily assured.
3. That efforts should be made to secure the continuation in the Journal of the reviews of Japanese medical literature.
4. That it should be the definite policy and aim of the Association to publish a medical journal that will not only meet the needs of the Association itself, but will also command the respect and interest of the medical profession of Europe and America.

On behalf of the Association the Executive passed a unanimous vote of thanks to Drs. Hutcheson, Snell, and Hadden for the excellent report presented, which was adopted.

As the papers read at the meetings of the Conference as a whole and in the sectional meetings were very numerous and it was most desirable to have them published as soon as possible, the following resolutions were carried:

"That the editor of the China Medical Journal be authorised to issue as a supplement to the Journal the selected papers of the Anatomical and Anthropological Association of China presented at the Conference of the C. M. M. A. in Peking, February 1920."

"That the editor be also authorised to issue as a supplement to the Journal the papers read at the Conference of the C. M. M. A. held at Peking, February 1920, relating to the condition of mission hospitals in China."

A resolution was carried that a member of the Executive Committee may appoint a proxy to any meeting of the Committee which he is unable to attend.

A motion was carried that a meeting of the Executive Committee be held in October next, that notice of this meeting be published in the July number of the China Medical Journal, and that members who desire to lay any business or other matters before the Executive be invited to forward their communications beforehand to the Executive Secretary.

The Biennial Conference Committee, 1922, will be appointed at the meeting of the Executive Committee to be held in October.
A resolution was carried favoring the holding of regional conferences in the interim between the biennial Conferences. Dr. Houghton was asked to draw up suggestions for these conferences.

The following resolution, passed by the Conference and referred to the Executive Committee, was next considered.

**WHEREAS**, the provinces of Kansu and Shensi have but one mission hospital, and no hospitals exist in North Shansi and Inner Mongolia,

**Resolved**, that the Executive Committee be instructed to confer with missionary societies working in these areas with a view to the fuller occupation of these regions.

The Executive Secretary was asked to forward a copy of this resolution to all the missionary societies concerned.

The following resolution, proposed by Dr. Geo. Hadden, which was passed at the Conference and referred to the Executive Committee for further action, was next considered:

**Resolved**, that this Conference instruct the Executive Committee to study, through a suitably constituted sub-committee, the whole subject of the training of hospital assistants; to report from time to time in the columns of the China Medical Journal the results of their deliberations; and to take such action in the matter as may seem advisable or possible.

The Executive Committee decided to refer this resolution to the Council on Hospital Administration, asking it to appoint a sub-committee to study and report on this matter.

A resolution was carried that the President, Dr. Johnson, write a letter of sympathy to Mrs. Menzies for the loss she had recently sustained in the death of her husband.

There being no further business the meeting adjourned.

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**GREAT BRITAIN AND THE OPIUM TRAFFIC.**

The Dangerous Drugs Bill, recently before the British Parliament, is designed to give effect to the International Opium Convention which Great Britain, by Art. 295 of the Treaty of Versailles, bound itself to bring into force. Besides forbidding the importation of raw opium into the United Kingdom, except under licence, and preventing its export therefrom to any country prohibiting or restricting its importation (again except under licence) it absolutely forbids the import into or export from the United Kingdom of any prepared opium. Opium smoking and its attendant offences are covered, while a third section is designed to prevent the import or export of cocaine, morphine, etc., and makes legislative provision of a similar nature against any new derivative of these drugs or their salts. The punishment for any offence against the Act on summary conviction will be a fine not exceeding £200 or imprisonment with or without hard labour for not more than six months.
Japanese Medical Literature.

Review of Current Periodicals by the Staff of the Research Department, Severance Union Medical College, Seoul, Korea.

RALPH G. MILLS, M.D., Director.

Gann
(Jap. Ztschr. f. Krebsforschung)
Vol. xii, No. 4. December 1918.

(595) Sarcoma of the White Rat. Experimental studies of the transplantability of an adeno-fibroma of the white rat, and the artificial production of a sarcoma from the stroma of this tumor. Part 2, Abstract in German text. Pages 43-49. N. Umehara.

In the first report the author had shown the transplantability of the adeno-fibroma, which, however, became more difficult with repeated animal passages. In this article he reports experiments designed to increase its transplantability, and to cause a malignant transformation of the tumor. He tried injecting into the growing tumor: (1) 2% solution of ethyl alcohol; (2) 1% cholesterin in olive oil; (3) 1% scarlet-red in olive oil; (4) 1% Sudan III in olive oil. He succeeded only in two out of three experiments with Sudan III solution, after 17 injections over a period of 42 and 57 days respectively. In these rats the tumors showed in places the structure of the original adeno-fibroma; in other parts that of a very cellular sarcoma, containing round cells, spindle cells, and giant cells, and showing numerous mitotic figures.

The sarcomatous portion of these tumors on inoculation into other rats gave rise to rapidly growing sarcomatous tumors, which underwent early necrosis and softening, metastasized extensively to the lymph glands and other organs, and caused death from cachexia. This artificially produced sarcoma be carried through 14 generations of animals. After repeated passages it showed a tendency to revert to the benign fibroma type.

Injections of killed tumor cells and of expressed tumor juice caused no tumor formation. The tumor could not be transferred to other species, and only with difficulty to black-spotted rats of the same species.

Extensive bibliography. Illustrations.

Gann
(Jap. Ztschr. f. Krebsforschung)
Vol. xii, No. 4. December 1918.


Feeble radiation of extirpated tumor tissue stimulates growth, if the tissue is subsequently inoculated; strong radiation temporarily retards growth.

A single radiation in situ of an inoculated tumor fragment causes no gross change in size; but microscopically there is degeneration of the cell nuclei proportional to the strength of the radiation. Repeated radiation stopped the growth of the tumor, or even caused a diminution in size, with disintegration of the nuclei, round cell infiltration, necrosis, mucoid degeneration, and connective tissue proliferation.
Japanese Medical Literature.

(597) The Leucocytes in Rats with Sarcoma. German abstract; Page 50. T. Maeda.

In normal rats, the total number of leucocytes was from 10,000 to 20,000; of these, 66% were lymphocytes; 30% polymorphonuclear neutrophiles. In sarcomatous rats the total number was increased to 40,000-140,000; the lymphocytes numbered about 27%; the neutrophiles, 70%. There was no appreciable change in the number of lymphocytes during absorption of the inoculated tumor.

In splenectomized rats the lymphocytes were increased to about double the normal number, even to 50,000; the increase appearing from the 4th to the 11th week. If inoculated with tumor tissue during this period, the same leucocytosis developed, as in unoperated rats. In one rat with a leucocytosis of 100,000, the inoculated tumor continued to grow.

Sei-I-Kwai Medical Journal


By using Levaditi's method of silver impregnation the authors demonstrated spirochetes in the stomach wall of one of eighteen cases of cancer, and in one out of nine cases of ulcer. These organisms were found in the circular muscle layer in great numbers, and were not associated with any bacteria. The tissue was not necrotic, as shown by its staining reactions.

Smaller numbers were found in the partially necrotic mucous membrane in association with bacteria. They were found in the walls, and in the lumen of thrombosed vessels in the mucous membrane and muscular coats.

The spirochtes in the two cases were indistinguishable morphologically; were 4 to 14 microns in length: 0.2-0.4 in breadth; showed 2-9 turns, which were shallower and less regular than in Treponema pallidum.

No conclusions were drawn as to their significance.

Sei-I-Kwai Medical Journal

(599) Starch Granules Converted into Glycogen, after Injection into the Tissues of the Rabbit. Pages 1-5. M. Okozaki. (English text).

In a previous article the author had reported that seven days or more after intravenous injection, starch granules in the lung or liver have a positive reaction for glycogen when tested by Best's ammonia carmine and iodine reaction. In this work he found that a similar change in the staining reaction of the granules occurred after injections into the corium. Preliminary intravenous injections of starch granules of the same, or of different origin, did not increase the rapidity or extent of this change in the granules.

Fukuoka Ikwaigaku Zasshi
(Medizinische Zeitschrift herausgegeben von "Zasshibu" der Med. Fakultät der Kaiserl. Universität Fukuoka (Kyushu, Japan)
Vol. xi, No. 4. October 1918.


On the basis of feeding experiments conducted on mice, rabbits and hens, the authors conclude that beri-beri is caused by cholic acid and its derivatives. Further work is in progress.

The data were based on the examination of 2,600 Japanese bodies, both sexes, in the pathological institute of the University of Fukuoka. The tables give the dimensions and the weight, absolute and relative to the body weight, of the heart, spleen, liver, and of each of the two kidneys, for 48 different age periods from 2 weeks to 60 years. [The statistics, which occupy 9-10 closely printed pages of figures, cannot be reproduced here for want of space.—Er.]

Tokyo Igakukai Zasshi
(Mitteil d. med. Gesellsch. z. Tokyo)


The poison was extracted from the eggs of the globe fish by the method of Tahara, which is described in detail. By repeated precipitation in absolute alcohol, it was obtained in pure form as a white powder, soluble in water, tasteless, neutral in reaction. It gave negative reactions for protein, and a negative murexide test. Positive results were obtained with Jaffe's creatinin reaction, with ninhydrin, with Joachim's test for NH₂, and for sulphur. Reactions for alkaloids were negative.

The poison was unaffected by sunlight, and resisted boiling for 4 hours, but was destroyed after 6 to 9 hours. The poison was decomposed by pepsin in 8 hours; not by trypsin emulsion, invertin, or bile. It was very resistant to mineral acids, but was destroyed by boiling for one hour with 1:10 volume of concentrated HCl. It was destroyed in a normal solution of NaOH or KOH.

The poison reduced copper solutions actively, showing 26% to 36% of the reducing power of pure glucose. The poison was not fermentable but became so after inversion with acid, etc. It was dextro-rotatory. After boiling for an hour with phenyl hydrazine, oszone crystals were obtained which were identical in form and in melting point with glucosazone crystals. After inversion by any method the crystals were formed at room temperature, and the toxicity of the solution disappeared after their formation.

Typical crystals of glucose benzoate were obtained by adding benzoyl chloride to the poison in alkaline solution. It gave the characteristic color reaction of glucose with naphthol and thymol more readily after inversion than before.

Negative reactions were obtained for pentose, lactose, glycuronic acid (with naphthoresorcin), inosite, formose, glyoxin and glycosamine.

From these facts, and from the relatively constant values obtained from its reducing power, rotatory power, and yield of oszone, the author concludes that the glucose must be its constituent part of the poison and not be merely mixed with it as an impurity. He was unable to determine definitely whether it is a glucoside or a glucose ester, but thinks the latter view is the more probable.

Iji Shimbun
(Medical News)

Red mita (Akamushi); pupal form developed from larvae removed from skin of human patient. Pages 1597-1600. S. Ohnuma.

The total length of the body was 0.4 mm. There was a definite constriction between the cephalo-thorax and abdomen. The cephalo-thorax was elliptical,
Japanese Medical Literature.

0.2 mm. in longitudinal diameter and 0.24 mm. in transverse, and pointed anteriorly. The abdomen was circular in outline (0.2 mm. in diameter). Color, ash-white.

There were four pairs of 6-jointed legs, the anterior being the longest. The last joint of the first leg measured 0.11 mm. long by 0.06 broad, the fifth joint, 0.06 long by 0.036 broad. Each leg had 2 claws at the tip.

The oral palpus consists of 5 joints, the fifth joint constituting a thumb and ending in a fine tip. The fourth joint ends in a claw and has two cristae along its inner aspect. The chelicerae have a claw at the tip, and are serrated along the concave margin.

The crista metopica is a ridge extending transversely across the abdomen, with an areola at each end from which extends a long hair (0.11 mm.); while another hair (0.023 mm. long) arises in front of the crista.

The anus and sexual pore are elliptical (long axis in anterior-posterior diameter), in the center of the ventral surface of the abdomen. There are two pairs of elliptical shaped suckers (0.015 x 0.0085 mm.) on each margin of the sexual pore.

The hairs on the body are long, feathery, and blunt at the tip. Those on the legs are feathery and pointed.

Eyes and stigmata were not clearly discerned in the fixed preparation.

This description corresponds to that given by Nagayo of a form developed from a larva removed from a rat.

Nippon Biseibutsugakkai Zasshi

(Journal of the Japan Protozoological Society)


(604) CHOLERA VIBRIO, IMMUNOLOGICAL STUDIES OF CERTAIN STRAINS of.


Strain "Japonica-1911" has high agglutination titre with certain sera derived from epidemics, and low with others made with strains from non-epidemic cases.

Strain "Formosanica-1911" is just the reverse. When mixtures of the former are made with sera the entire amount of agglutinin is absorbed, but with the latter only those are removed which are strictly specific. Sera made with the Formosanica-1911, and treated with the homologous strain lose all agglutinins; but absorption is not complete with the Japonica-1911. Complement fixation with these two strains runs parallel with the agglutination.

Animals immunized with Japonica-1911 can withstand lethal doses of all other known strains, but those injected with Formosanica-1911 are protected against that form but not against Japonica-911.

Sera acted the same after dilution with distilled water and preservation for two to six months as when fresh.

The strain, El-Tor, is essentially identical with Japonica-1911, but it was found that cultivation of the former to the 10th generation in serum broth changed its character till it was immunologically identical with Formosanica-1911. Some forms of the latter could be changed in the same manner back to the Japonica-1911 type. On the other hand, cultivation of these in broth to which has been added the homologous serum causes them to lose all but their specific agglutinative power. Cultivation of these forms in heterologous serum broth causes them to lose their agglutinative faculties for that particular strain, but does not interfere with their action toward their homologous serum.

The Kiran form of Formosanica-1911, when cultivated in the gall bladder of a rabbit, is changed in its character to that of Japonica-1911, while form "Sasac" of the Japonica-1911, under the same conditions, is made to resemble the typical Formosanica-1911 strain.
Plototoxin is the active principle of a poison found in small cystic dilatations of the glands at the base of the spines which form part of the dorsal and pectoral fins of this fish. It is made up with glycerine or saline solution, but is insoluble in alcohol or ether. It contains two active substances to which the names plotospasmin and plotohemolysin have been given. These substances can be readily separated by absorption methods.

The symptoms produced by a lethal dose of the plotospasmin given to various lower animals are convulsions, which begin generally in the back legs; dyspnea, excitation, masticatory movements, scratching, frequent passage of urine and feces, occasionally hemoglobinuria, extreme dilatation of the pupil, and slight fall in body temperature. The M.L.D. in c.c. per kg. of body weight for various animals is as follows: white mouse, subcutaneously, 2.5; guinea-pig, subcutaneously, 3.5; intravenously, 0.12; rabbit, subcutaneously, 4.0; intravenously, 0.3; sparrow, intramuscularly, 4.3; dove, intramuscularly, 42.9; gold fish, intramuscularly, 1.1; green frog, subcutaneously, 7.0; snake, subcutaneously, 10.5; water lizard, subcutaneously, 46.2. The action is manifest when introduced by these routes and also by the spinal canal, neurilemma of any nerve, and per vaginam. It seems to be inert when given orally. At the point of injection there is intense inflammatory reaction, but no hemorrhage.

There is definite fixation of the toxin by the tissues of the medulla, to a less extent by the cerebral cortex, but none at all by the white matter of the cerebrum or cerebellum. The internal organs of these animals seem to be free from attached toxin with the exception of the brain membranes of the dove. Emulsions of the brain substance proper will absorb the plotospasmin from the whole poison, leaving the plotohemolysin unaffected, while an emulsion of blood corpuscles will with equal facility remove the hemolytic body.

Plotohemolysin exerts itself against the blood corpuscles of the rabbit, dog, guinea-pig, rat, pig, cat, white mouse, turtle, carp, chicken, eel, sparrow, also against human corpuscles (from the umbilical cord); but not against cow, goat, dove or bull-frog. No complement is necessary and lecithin takes no apparent part. It is inherently different from that found in eel serum or that produced by staphylococci. It combines with the red cells at a temperature as low as 1°C. which is, of course, independent of any complement, but in the cold the cells are not destroyed.

The resistance of such animals as man, cow, rabbit, guinea-pig, horse, and goat, is not to be attributed to any trace of natural antihemolysin, as this has not been found to be present. The dove has no such natural protection but does have in its subcutaneous tissues spasmin-binding entity. The goat has receptors in neither brain nor blood, and the fish which produces the toxin has no demonstrable antibodies in any part of its structure.

The blood corpuscles of the human foetus and those from an advanced tuberculous patient are twice as susceptible to the toxin as those of a healthy individual. The blood of patients with cancer, leprosy, or syphilis, is not more susceptible to its action.

The poison is quite resistant to heat, the hemolysin portion being destroyed in two hours at 100°C. and in 30 minutes at 140°C.; while the spasmin becomes inert in one hour at 100°C. and in 30 minutes at 135°C.

Low temperatures were even less effective being able merely to lower the toxicity a little but not to change its character.

Direct sunlight reduced the potency of the spasmin to % in 45 days and to % in 100 days. The purple end of the spectrum had only slightly more action than the red rays. In the case of the hemolysin, the 100 day exposure reduced its efficacy to 1/10 value, and the red rays seemed much the more destructive.
The ultraviolet rays reduced the potency of spasmin one-half in 40 minutes and to $\frac{1}{2}$ in 60 minutes. The last exposure had no appreciable influence upon the hemolysin.

The X-ray destroyed almost the entire toxicity in 80 minutes, but the continuous passage of an electric current of five milliamperes for three hours had no appreciable effect.

Shaking of the solution for 100 hours at the rate of 150 times per minute, reduced the spasmin to half value but did not affect the hemolysin.

Plotospasmin is very resistant toward acetic acid, lactic acid, and ammonia, but is easily affected by n/20 HCl. A similar solution of soda merely prolongs the lethal period.

The toxin is resistant against potassium chlorate, iodine trichloride, oxygen, hydrogen, carbon dioxide, etc., but is destroyed by Lugol's solution, and by hydrogen peroxide. An exposure of 30 days to sulphuretted hydrogen destroys the hemolysin, but not the spasmin. The toxin loses its action with artificial gastric juice and pancreatin, is reduced by alcohol and chloroform, but is not affected by saliva, adrenalin, neurin, and lecithin. The addition of urea decreases the toxicity but increases the hemolytic power.

Antibodies were produced in response to the action of both the spasmin and the hemolysin. The degenerating action of heat and chemicals affects the haptophore group, but the X-ray and hydrogen peroxide injure the toxophore. Small additions of active toxin or lecithin cannot restore the lost activity.

No leucocidin has been demonstrated in the toxic fluid, but there is a definite decrease in the number of leucocytes in the blood following an injection. The general toxicity of the solution seems to be slightly decreased by exposing to the action of complement, but the action of the spasmin or the hemolysin is not affected, nor does it render the toxin inactive.

The toxin does not restrain the growth of typhoid bacilli, cholera vibrios, B. coli, Staphylococci, or B. pyocyanens, nor does it hinder any other hemolytic process.

An anaphylactic action is noted in guinea-pigs after the second dose of the toxic fluid filtered through parchment, but usually the animals do not die from the attack. The immune serum produced by the injection of the toxic fluid is also able to produce an anaphylactic reaction, but the latter is distinctly weakened by heating to 65°C. for 30 minutes, and was wholly lost when heated to 75°C. for the same length of time.

The antitoxin requires about two hours at incubator temperature for complete combination with the toxin, but the action can be stopped after 15 minutes by the use of eight times the volume of a balanced or neutralized solution. Plotohemolysin can be inhibited in the same way by adding antihemolysin to the mixture. The process in both cases is a progressive one, requiring more and more of the antibody to inhibit the combination as the duration of the mixture increases.

The antihemolysin is quite resistant to heat, withstanding an exposure to 70°C. for 30 minutes, whereas the antispasmin was distinctly weakened by this process. Both withstand drying without loss of activity. The usual phenomena of prophylaxis and cure were found to exist in the experimental injection of the toxin and the corresponding antitoxin, enabling the animals to recover after large doses that would invariably kill those unprotected or untreated. The affinity of the antibody is much greater for its antigen than for the animal tissues normally affected; however, a delay of over 10-30 minutes before administering the immune serum was usually disastrous in its results.

This substance is evidently bactericidal for most organisms, but is not likely to be of special therapeutic value. The lipoid extracted from it by alcohol and ether has a much stronger action than the original compound. It is thermostable, hemolytic, and requires no complement to facilitate its action.

An immune serum contains precipitins, but no agglutinins that are specific for any bacteria. The pyocyanase is antitoxic toward the diphtheria bacillus.


After a quite exhaustive investigation of this subject the author agrees substantially with previous students of the subject who have examined the normal flora of the soil. There is very little difference between the organisms of the two conditions, except that the number is a little greater in the case of the grave site. Various forms of bacilli are most commonly met with, while the cocci are reduced to a minimum. Pathogenic organisms were not found.


In the process of hemolysis the amboceptor combines with the red corpuscles and the latter are then acted upon by complement. Contrary to the view of Brand and Sachs, who hold that the middle piece of the complement first combines with the sensitized red corpuscles and that the end piece then unites with the corpuscle to produce hemolysis, the author found that a third ingredient of complement is essential to hemolysis.

He found that (1) there is a combination of corpuscles with amboceptor; (2) a combination with the middle piece of the complement; (3) union with the end piece; and (4) union with the author's third piece.

He studied the behavior of complement in mixtures at 0°C. and found that there is neither hemolysis nor union of complement with sensitized corpuscles if the amount of amboceptor present is small. If a large amount of amboceptor is present, a slight degree of hemolysis takes place. If there is no trace of hemolysis, there is no combination of complement with the sensitized corpuscles. If, however, a sufficient excess of amboceptor is present, and some hemolysis occurs, union of complement with the corpuscles takes place. The middle is almost entirely combined (at 0°C in four hours), but only a very small amount of the end piece and of the author's third substance. Therefore, attempts to prevent the union of complement with sensitized corpuscles by keeping the mixture at 0°C. may not be successful.

The author studied complement from the dog, cat, chicken, horse, and man. All of these complements can be split into the three fractions described. Furthermore, any fraction of any one of these complements may be substituted for the corresponding fraction of guinea-pig complement, without impairing the hemolytic activity of the recombined complement. No qualitative differences were found in the complement fraction obtained from any of the animal species studied.

Differences in the activity of complement were found to depend on the age of the animal, and on the age of the specimen of serum studied.

A feeble complement from a given species of animal was found to be deficient in one or more of the three fractions. Thus in serum of the dog and in human serum, the amount of end piece was small; in chicken serum and horse serum, the third constituent was very scanty; while in cat serum there was a deficiency of both the end piece and the third constituent. The middle piece was abundant in all these sera.

The activity of a given complement is stronger when used with an amboceptor derived from an animal of the same species as that furnishing the complement, than when used with an amboceptor from a different species.

The author found that the inhibition of hemolysis in hypertonic salt solution was due to a failure of the third constituent to combine with the corpuscles. He
found that combination of amboceptor with corpuscles occurred, and that also middle piece and end piece combined to some extent with the sensitized corpuscles. The addition of salt, therefore, is not a reliable method of separating complement and amboceptor.

In a positive Wassermann reaction the middle piece and the third piece were fixed, but the end piece was unaltered. The diminution of complementary activity during an anaphylactic reaction he also found to be due to a loss of the middle piece and the third constituent, while the end piece remained unchanged.

In the production, in vitro, of anaphylatoxin (mixture of antigen, antibody, and complement) both the middle piece and the third constituent were essential, but not the end piece.

If the isolated middle piece of complement was dissolved in salt solution it rapidly deteriorated, and acquired antihemolytic properties. It exerted this inhibitory action, not by preserving the union of the corpuscles with amboceptor, middle piece or end piece, but by preserving the union of the third constituent with the corpuscles.

Complement inactivated by shaking was found to have lost mainly the third constituent. If sufficiently shaken, however, both middle piece and end piece were also more or less completely destroyed.

Tokyo Iji Shinji
(Tokyo Medical News)
No. 2056. January 1, 1918.

(609) **Emetine Kerato-Conjunctivitis.** Pages 17-18. C. Oguchi.

On experimental instillation of an aqueous solution of emetine of over 1% concentration, keratitis and conjunctivitis develop, but only after the lapse of about 24 hours. In this respect emetine differs from mercuric chloride and most other corrosives, but resembles chrysophanic acid. The author suggests that emetine may act by causing congestion and transudation from the peri-corneal vessels, with a resulting oedema of the cornea, and finally ulceration.

(610) **Etiology of Autumnal Fever.** Pages 25-32. S. Kitamura and S. Hara. (Plate.)

The disease has long been recognized in the districts of Shida and Shigohara, along the River Ohoi in the prefecture of Shizuoka. Over 100 cases develop annually. The disease prevails from August to October, but mainly in September. It generally occurs in men of 20 to 30, most often in farmers.

The chief symptoms are fever (39° C. to 40° C.), severe headache, lassitude, nausea, rarely vomiting, thirst, anorexia, and muscular pains. Often there is vertigo and sleeplessness, usually constipation and oliguria.

There is marked congestion of the conjunctiva, and a marked general glandular enlargement (96% of the cases) with tenderness. The tongue is moist and heavily coated. The pharynx is congested. The abdomen is distended but not tender. The spleen is not palpable. There may be slight jaundice. There may be mental dullness, delirium and great prostration. The urine contains a little albumin and usually gives a positive Diazo reaction. The fever is usually of the continued type; lasts 5 to 8 or 10 days, and falls either by crisis or lysis. The pulse is full, of low tension, and relatively more rapid than would correspond to the height of the fever. Death rarely, if ever, occurs from the attack. There may be loss of vision as a late sequel, due to clouding of the vitreous humor; rarely to cataract, or to choroido-retinitis.

The blood of two patients after recovery gave negative agglutination tests with typhoid and paratyphoid, and also negative reactions by the method of Oushi and Ineda with the spirochæte of hæmorrhagic jaundice. Yito has found that
the serum of an autumnal fever convalescent had the same specific action on the
spirochaete he isolated from seven-day fever, as did the serum from a patient
recovering from the latter disease. He therefore concluded that the two diseases
are identical.

The author succeeded in demonstrating a spirochaete in the blood of a patient
at the height of the disease, directly in stained blood films, by direct culture, and
by intraperitoneal inoculation into guinea-pigs. The spirochaete was demonstrated
in the blood of the guinea-pig on the 5th to 8th day. Occasionally it was demon­
strated as early as the third day by direct examination under dark field illumina­
tion and by culture. The animals contract the infection in a large proportion of
cases. They lose appetite, become weak and inactive, and may die in collapse,
or may recover. The usual lesions are subperitoneal haemorrhages with little or
no exudate, spotty haemorrhages in the lungs, enlargement of the spleen and
lymph glands, especially of the mesentery. In some cases there was jaundice,
with extensive haemorrhages, especially from the nose, intestine, in the serous
membranes and muscles. The organisms were found chiefly in the blood and
liver; in severe cases in all the organs. Late in the disease they were regularly
present in the kidney.

It was proved that the urine contained the organism as the intraperitoneal
injection into guinea-pigs of urine from four out of five patients, on the 8th, 18th
(twice) and 30th days of their illness produced the disease in the guinea-pigs
injected.

The spirochaete was small, slender, its length two to three times the diameter
of a red corpuscle. It was feebly, retractile, and not distinctly beaded.

However, the author is doubtful as to the significance of this organism, since
he reports finding forms (dark field) in the blood of healthy guinea-pigs, house
mice, and field mice, and in the blood of three patients not suffering from autumnal
fever. He thinks one must be cautious in interpreting the finding of spirochaetes
in urinary casts, and in the kidneys of human beings.

Tokyo Iji Shinji
(Tokyo Medical News)

No. 2057. January 12, 1918.

(611) ETIOLOGY OF AUTUMNAL FEVER. (Part II.) Pages 116-122. S.
Kitamura.

Guinea-pigs which received intraperitoneal injections of blood from autumnal
fever patients (on the 2nd, 3rd, and 4th days of the disease) showed characteristic
symptoms of infection. The blood and organs were found to contain spirochaetes.
In four or five cases spirochaetes were found in stained films of the blood of the
patients.

In five experiments the urine from four patients on the 8th and 18th days of the
disease also produced the disease on intraperitoneal injection into guinea-pigs.

The spirochaetes are able to infect the guinea-pig through the abraded or the
normal skin; and through the mucous membrane of the digestive tract.

Most of the guinea-pigs manifested a distinctive disease which terminated
fatally. While some haemorrhages were found as a rule, in only one were there
profuse haemorrhages and jaundice, as in animals infected with the spirochaete of
infectious jaundice.

Morphologically, the spirochaete of autumnal fever is indistinguishable from
the spirochaetes of infectious jaundice and seven-day fever.

The author cultivated them by the method recommended for the organism of
infectious jaundice; and also by simply inoculating a tube containing ten mils of a
0.07% solution of calcium chloride in distilled water with three drops of infected
blood. The spirochetes are said to have multiplied profusely after two weeks in this medium, and to have been motile and viable after three months. Guinea-pigs could be infected by injections of these cultures.

The differentiation of the spirochete of autumnal fever as a distinct species, or its identification as a known species, can be carried out at present only by immunity reactions. The author used Phipel's method, used by Quata and by Ido for differentiation of the spirochetes of relapsing fever and infectious jaundice. The liver of a guinea-pig infected with the spirochete of hemorrhagic jaundice of the Kikuchi type was emulsified, and after determining the presence of numerous motile spirochetes, one mill was mixed with one mill of serum, and the mixture injected intraperitoneally into a guinea-pig. After 30 minutes to two hours, the exudate was examined under a dark field for organisms. The presence or absence (A + Phipel reaction) of spirochetes in emulsions of the organ after the death or killing of the animal (8-14th day) was determined. This was found to be more reliable than the examination of peritoneal exudates.

Of three tests with the serum of a case of hemorrhagic jaundice, one was positive, and two negative. Serum from one case of seven-day fever was negative. Of five-daj sera from patients with autumnal fever, three reacted positively and two were negative, as was the blood of a guinea-pig which had been infected with spirochetes of the Kawamori type from a patient with autumnal fever. The possibility of these three cases being mild forms of infectious jaundice is discussed, but this diagnosis is regarded as improbable from the clinical evidence, especially since recognized mild cases of the latter disease are not restricted in their occurrence to any particular season.

The close relationship of the spirochetes from the second disease is suggested by the similarity of the lesions in inoculated guinea-pigs. The crucial test as to their immunity reactions gave inconclusive results, and the question is left open though the author inclines to the view that they are distinct.

*Hifukwa, Hitsunyokwa Zasshi*
(Japanese Journal of Dermatology and Urology)

(612) **DYSHIDROSIS.** Pages 1-24. M. Ota. 2 Plates.

In ten cases of dyshidrosis the author cultivated from the affected tissues a peculiar fungus, not obtained from ordinary forms of eczema, or from normal skin. The organism grew well on ordinary media; best at room temperature and on media feebly acid in reaction which contained sugar. It formed a white, powdery, or short filamentous growth; later turning yellowish or pale-red. The hyphae were straight, or slightly undulating, threads. They formed large free spores 3-5 microns in diameter; also clampidospores. Attempts to produce identical lesions in animals failed.

(613) **ACANTHOSIS NIGRICANS.** Page 57-58. Y. Nishikawa. 1 Plate.

The author reports a typical case of this disease, with a description of the histological changes. The only essential addition to our general knowledge of the disease is the reported deposition of pigment, chiefly in the spinous celled layer of the epidermis, which seems to be marked in Japanese, and slight or absent in Europeans.

Iji Shimbun
(Medical News)
No. 989. January 10, 1918.

(614) **ANTHRAX BACILLUS.** Pages 11-14. S. Matsumura.

The author reports that the forms of Anthrax bacillus which are not capsulated showed a greater resistance to the action of immune serum than did the typical encapsulated forms.

(615) **LYMPHOMA MALIGNUM.** Page 49. T. Seo.

The author implanted in the peritoneal cavity of guinea-pigs pieces of lymph glands removed from 67 cases of lymphoma malignum. Many of the animals became emaciated and died; the majority, but not all, of the latter were tuberculous.
The China Medical Journal.


Saturday, February 21, 1920.

The China Medical Missionary Conference opened on Saturday night, with a reception given at the new buildings of the Union Medical College, where the delegates with their friends were received by Dr. C. J. Davenport, F.R.C.S., the President of the China Medical Missionary Association, Dr. Morris, the Secretary of the Association, and Mrs. Morris, and Dr. and Mrs. Korns, on behalf of the Peking Branch of the Association.

Nearly 500 foreign and Chinese visitors to Peking and prominent local missionary and other residents were present. The grounds, though still unfinished in many parts, were illuminated with large Chinese lanterns, and the visitors were greatly impressed by the beautiful architecture of the fourteen blocks of buildings with their Chinese green tiled roofs and modern sanitary interiors.


On Sunday afternoon, the Rev. E. C. Lobenstine preached the Conference sermon to a crowded congregation at the Y. M. C. A. auditorium, taking for his text the passage: "Go tell John what ye have seen and heard; the blind receive their sight, the lame walk, the lepers are cleansed and the deaf hear, the dead are raised up, and the poor have the good tidings preached to them." Unfortunately, notes of the sermon have not been received.

At the British Legation Chapel the Rt. Rev. F. L. Norris, D.D., preached a deeply earnest sermon from the words: "Jesus of Nazareth . . . . . . God anointed Him with the Holy Ghost and with power: He went about doing good and healing: and we are witnesses of the things which He did." (Acts x: 38.) The main points only of the discourse can be given.

Medical missionary work, said the preacher, is an essential part of the Christian witness to Jesus Christ. There was a time when men went about to preach Jesus, and laid all the stress on his teaching, his work of healing being only mentioned as a proof of his power, not as a work in which men had to follow him. Later, when there was much opposition to the simple but narrow preaching of the gospel, it was found that the benefits of modern medical science opened closed doors and medical missions came to be regarded as a useful form of pioneer work. Then came the question, should such work be encouraged when not essentially pioneering? To say that medical work more readily secures financial support is not sufficient. The answer is only to be found in Christ's life and in the apostles'
witness; in the marvellous growth of medical science and in the work of hospitals, which are in themselves the direct fruit of Christianity. We must preach, pray, suffer, and heal as Christ did. Medical missionary work is an essential part of the witness to him. Some confuse this witnessing with medical efficiency; others think preaching is so essential that there cannot be witnessing without it; still others think that if the preaching is earnest, the standard of medical efficiency does not matter.

The first necessity for faithful witness is Christ-like character, and that character needs to make itself evident right through the staff, from the gatekeeper who admits the patient, to the surgeon who operates on him and to the nurse who looks after him. The spiritual atmosphere of the hospital must be one of prayer.

The sound necessity for faithful witness is that we do our best. Any sacrifice of efficiency, any contentment with a standard lower than we might reach, any deliberate or careless acceptance of bad conditions, insanitary surroundings, and so on, is incompatible with true witness to Jesus Christ.

If one primary requisite is the highest standard of medical efficiency, how is the other primary requisite, the Christian atmosphere, to be preserved? By prayer; the whole staff must consist of people who pray, not only by “leading in prayer” in the hospital wards or waiting rooms, but also in the time spent in private, personal, habitual prayerfulness. And all gifts and service should be consecrated by prayer.

Our share in medical missions may be direct as medical workers; or indirect, as subscribers to medical work. Whatever form it takes, our efforts must aim at bearing effective witness to Christ, and for that prayer is essential. Prayer is our means also for sanctifying, for consecrating our work and our free-will offerings that they may bear witness unto Him.

Also in the afternoon the National Medical Association of China entertained 300 visitors to tea at the Lockhart Hall, Mrs. Wu Lien-teh presiding.

FIRST DAY OF C. M. M. A. CONFERENCE.

PEKING, FEBRUARY 23, 1920.

Following a devotional service at 9 a.m. conducted by Dr. J. L. Stuart, the Conference was called to order by the President, Dr. Cecil J. Davenport, who gave an address in which he dealt with the changing conditions brought about by the Great War, the losses which the Association had sustained by the death of some of its prominent members, the need for the revision of some of the decisions arrived at in Canton at the last conference, the great opportunities which were being presented to the medical missionary body and the significant advance which had taken place from the standpoint of medical education. (CHINA MEDICAL JOURNAL, 1920, p. 150.)

Dr. Wu Lien-teh, the President of the National Medical Association of China, on being introduced extended a hearty welcome to the
The China Medical Journal.

delegates on behalf of the Association which he represented. He emphasized the need of mutual co-operation, sympathy, and toleration between foreign and Chinese doctors in bringing China to a proper appreciation of medical science and sanitation.

Dr. H. J. Howard and Dr. John A. Snell were elected Recording Secretaries of the Conference.

The following were appointed as the Conference Business Committee: Dr. C. F. Johnson, Chairman, and Drs. Agnes Murdoch, John Kirk, F. C. Yen, W. G. Lennox, H. H. Morris.

The following were appointed as a Nominating Committee: Dr. J. H. Ingram, Chairman, and Drs. Duncan Main, J. Oscar Thomson, T. Gillison, J. W. Pell, Harriet Love, J. C. Carr, Henry Fowler, Allen C. Hutcheson, Geo. Hadden.

The first paper, read by Dr. Harold Balme, was a survey of missionary hospitals in China based upon questionnaires sent to every mission hospital. Out of 250 hospitals open, 199 returned replies. The total cost of these hospitals was Mex. $14,500,000, equipment $5,000,000, and cost of average bed, $500. Although many were well equipped and up-to-date, some had no fly screens for latrines or kitchens, and possessed no baths or bedding. He reviewed in a masterly way the needs of these hospitals and urged that if good Christian work was to be carried out in China, more money must be spent and more men and women workers obtained by the missions in this country.*

Dr. John Snell (Soochow), in a paper on the "City Hospital," recommended that each important city should establish at least one modern hospital costing $300,000 with an annual budget of $75,000. He urged that influential Chinese residents should be invited to serve on the boards of management of each mission hospital.

Dr. A. C. Hutcheson, Nanking, who spoke on the "Up-country Hospital," maintained that extremes were undesirable, and pressed for placing well-trained Chinese physicians on the same footing as foreigners, so as to prepare for the time when these hospitals can be entirely managed and supported by Chinese.

Dr. Houghton dealt with the question of a uniform and up-to-date method of keeping hospital accounts and illustrated his remarks by means of diagrams showing specimen pages.

Dr. Robert C. Beebe's paper on "A Purchasing Agency for Hospitals," owing to lack of time was read by title.

* All papers on the affairs of mission hospitals read at the Conference, with the discussions thereon, will be reported in full in the Hospital Supplement to the CHINA MEDICAL JOURNAL, 1920.
First Day of C. M. M. A. Conference.

BUSINESS SESSION, 11 30 a.m.—12 m.

The Report of the Editor of the CHINA MEDICAL JOURNAL, which had been distributed in printed form, was taken as read, and on motion was deferred for action until some subsequent meeting.

The Secretary read the following letter from the Military Governor of Shansi:

"It gives me the greatest pleasure to learn that a meeting of the Medical Missionary Association of China will be held in Peking, February 21-28. This short message from me is just to congratulate the Association on the valuable work it has done in the past and the still better service you gentlemen may be able to render to China in the future. Not being a medical man myself, I can simply say that I heartily hope the Conference will be a great success and that everything will be satisfactory."

It was voted that the letter be inscribed in the Minutes of the Conference and the Secretary was instructed to reply to the Governor's kind message.

The Secretary read a letter from the Honorary Secretary of the Hongkong Branch, British Medical Association, introducing as its representative Prof. H. G. Earle, M.D., the Dean of the Faculty of Medicine of Hongkong University, and wishing the Conference every success.

After several announcements, on motion the meeting adjourned at 12 noon.

SECTIONAL CONFERENCES.

Section on Anatomy and Anthropology.*

RELATIONS OF ANTHROPOLOGY TO MEDICINE.—Dr. Hrdlička of the U. S. National Museum, Washington, D. C., first gave a short résumé of the history of anthropology showing the recent origin of the science and its rapid rise in importance in the latter part of the 19th century. He noted that the most famous leaders in anthropology were medical men eminent in their profession and defined the science concisely as anatomy, physiology, histology, and pathology applied. All the great centres of learning are especially famous on account of their valuable collections to which students from far and wide are attracted, and for this reason Dr. Hrdlička emphasized the desirability of establishing an organized system for the collection of material in China on a large scale and for placing it in a form available for study.†

Discussed by Davidson Black and P. C. Hodges.

* Abstracts or full reports of all papers read before this section will appear in the "Anatomical Supplement" to the CHINA MEDICAL JOURNAL, 1920.

† The complete paper will be published in The American Journal of Physical Anthropology.
ATTITUDE OF CHINESE GOVERNMENT TOWARDS DISSECTION.—Dr. Chen, Official Representative of the Board of the Interior, addressed the section on the "Relation of the Chinese Government to Dissection" quoting from regulations on the subject and forecasting the probabilities of the future. (Full report, China Medical Journal, 1920 pp. 289-291.)

The address was discussed by Professor Earle of Hongkong University and Dr. Douglas Gray of the British Legation, both of whom expressed the opinion that public opposition was not by any means as prevalent as it was supposed to be. Mr. Roger Greene also gave details showing the hearty co-operation of some of the provincial authorities.

THE JEWISH COLONY AT KAIFENGFU. DR. C. D. TENNEY, American Legation, Peking, after mentioning the fact that no trace of the old Kaifeng synagogue remains, proceeded with a description of two ancient tablets, written in the 2nd year of Hung Chih (A.D. 1489) and the 7th year of Cheng Te (A.D. 1513) respectively, in translating which he brought out some interesting points with regard to the colony. He then reviewed the observations of early travellers in China with regard to the presence of foreigners, particularly Jews. In concluding, he remarked that two great lessons were to be learned from the history of this Jewish colony: first, that the Jew as a trader has met his match in China, and instead of enriching himself at the expense of his Chinese neighbours, has been sucked dry in the competition of trade; and second, the extraordinary assimilative force of Chinese society. In the discussion which followed it was mentioned that traces of Jewish blood may still be traced in Kaifengfu in the physiognomy of a small portion of the inhabitants.

REPORT ON THE HEIGHT, WEIGHT AND CHEST MEASUREMENTS OF HEALTHY CHINESE. By the Research Committee of C. M. M. A. This report was presented by Dr. Allen C. Hutcheson, the Chairman of the Committee, and will be found reported in full in the Anatomical Supplement to the China Medical Journal July, 1920.

STONE IMPLEMENTS OF NEOLITHIC TYPE IN CHINA, by J. G. ANDERSSEN, Peking. After referring to the fact that the Geological Survey of China has taken up this line of work and has gathered much fresh material from the northern and central provinces, Dr. Anderssen brought forward interesting points of similarity between the neolithic stone implements found in China and North America. He then referred to his recent discovery in Anhwei of iron implements being used by the
farmers which bear a remarkable resemblance to the neolithic semilunar knives from which they are probably derived.

Discussed by P. C. Hodges, E. T. C. Werner, P. H. Stevenson, and W. W. Stifler

**Head Flattening,** by Mr. E. T. C. Werner (formerly H. B. M. Consul, Foochow). In his paper Mr. Werner described many interesting types of cranial deformation and drew attention to the fact that the practice of head flattening was still observed in certain parts of China.

Discussed by Davidson Black and Aleš Hrdlička.

**Anthropologisches Studium Uber Unterextremitaten der Chinesen.** Kotaro Shino, Department of Anatomy, South Manchuria Railway Medical School, Mukden.

[Read by title.]

**Observations Made at the Second Chinese Government Animal Experimental Station,** by Mr. Chou Wei-lien, the Director of the Government Animal Experimental Station.

Dr. Chou dealt with the milk-producing powers of different cattle, more especially, of the Mongolian cow. He gave interesting statistics of the increasing demand for milk by the Chinese during the whole year, instead of only during the cold weather, and reviewed the work done by the Government in handling the pest infection among cattle.


[Read by title.]

**Section on General Medicine.**

In the section on general medicine an interesting paper was read by Dr. W. W. Cadbury (Canton) on the treatment of leprosy. He spoke encouragingly of the results with chaulmoogra oil and its derivatives like gynocardic acid, with or without the addition of cod-liver oil.

In the discussion which followed Dr. Fowler (Siaoukan) still claimed leprosy as a disease of negation. Dr. Fowler made the happy announcement that, when in Canton a month ago, he saw Dr. Wu Ting-fang (the veteran diplomat) who promised to give an island near Canton for a modern asylum for 1,000 lepers as well as a gift of $5,000 for alleviating their sufferings.

Dr. W. G. Lennox (Peking) read a paper on "Syphilis of the Central Nervous System," and produced statistics to show that tabes,
general paralysis, and similar diseases were not as rare in this country as generally supposed.

Some notes on cases illustrating the diagnosis, prognosis, and treatment of "Insanity in everyday Chinese Practice" were read by Dr. R. M. Ross. (CH. MED. JOURN., September, 1920.)

Dr. John Kirk (Canton) read a paper on "Tetanus Neonatorum, a Study in Prophylaxis." (CH. MED. JOURN., July, 1920.)

**Section on General Surgery.**

Dr. J. Oscar Thomson read a paper on "Vesical Calculus" based on 3,000 cases operated upon in the Canton Hospital.

The discussion concerning the choice of operation was led by Dr. D. M. Gibson (Kaifeng), and Dr. Balme (Tsinan) dwelt on the value of functional tests of efficiency in operation.

Dr. J. A. B. Branch then read a paper on the treatment of empyema by Dakin's solution, based on the experience of 100 cases from army camps in America, and Dr. E. W. Kirk presented a paper on the "Secondary Suture of Wounds."

**Section on Diseases of Ear, Nose, and Throat.**

In this section Dr. A. M. Dunlap presented mimeographic demonstrations of common operations on nose, throat, and ear.

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A joint meeting of the China Medical Missionary Association and the National Medical Association was called to order at 8.45 p.m. by Dr. Wu Lieu-teh, President of the N. M. A.

The Report of the Council on Medical Education (CH. MED. JOURN., p. 176), presented by Dr. Balme, laid stress on the urgent need of greater support being given to the medical colleges at Mukden, Changsha, Tsinan, and Foochow. The following resolutions submitted by the Council were at once adopted:

1. That the congratulations of the Association be extended to the China Medical Board for their successful reorganization of the Peking Union Medical College on so generous and efficient a basis, and for the great impetus which they have given to medical education throughout the country.

2. That the Association records its gratification at the response which has been received from mission boards interested in the establishment of high-grade Mandarin medical education, and the large measure of co-operation which has already been extended to the School of Medicine, Tsinan, and would commend to such Boards the urgent necessity of increased financial support, in order to ensure the success of that enterprise.

3. That in view of the difficulties hitherto experienced in securing an adequate staff and support for the medical schools at Changsha, Chengtu, Mukden,
First Day of C. M. M. A. Conference.

and Foochow, the Association would commend to the incoming Council the careful consideration of the following questions, in consultation with the missions interested in the development of these schools:

(a) Whether steps can be taken to meet the urgent need of a broadened basis of support for the Medical School at Changsha, by the provision of an adequate endowment, or by the full co-operation of missions working in that area, in view of the fact that should this not be obtained, the continued existence of the School will prove impracticable.

(b) Whether the missions at work in South-west China can set aside a sufficiently large staff of efficient teachers to enable the West China Union University Medical Department to approximate to the C.M.M.A. minimum requirements.

(c) Whether some measure of co-operation between the Union Medical College, Mukden, and the School of Medicine, Tsinan, could not be satisfactorily arranged.

(d) Seeing that the Fukien Christian University is not intending to develop a medical department, as the Council is informed, should not the authorities of the Fukien Medical College be urged to reconsider the continuance of that school.

The following was the next resolution:

4. That the Association endorses the recommendation of the Special Conference on Women's Work appointed by the Commission of the Federated Women's Boards of North America, to the effect that one bi-lingual Women's Medical School of high grade be staffed and equipped on a union basis, and refers the matter of its location to the Council with power to act.

This resolution was referred to a special committee of seven, to be appointed by the Chairman and to meet with the appointed delegates and report at a later session.

The fifth and sixth resolutions submitted by the Council on Medical Education were as follows:

5. That the Association endorse the recommendation of the Council regarding the Premedical Syllabus, and adopts it experimentally for the next biennium.

6. That the incoming Council be instructed to prepare a similar syllabus, outlining satisfactory standards for the medical curriculum.

Action was deferred on these resolutions until after presentation of the papers on Pre-Medical Education.

The Report of the Council on Pre-Medical Standards was presented by Dr. W. H. Adolph in the form of a "Pre-Medical Syllabus." (Ch. Med. Journ., May, 1920.)

In support of this report Dr. Adolph read a paper entitled "Pre-Medical Standards" and Dr. F. C. Yen presented a paper entitled "Pre-Medical Education."

Resolutions Nos. 5 and 6 (above) of the Council of Medical Education were then adopted.

A paper on "Experiences in the War," by Dr. J. W. Pell, was also on the programme for the day.
Dr. Koh was introduced and presented a letter from the Chinese Minister of Education on the Department's policy concerning medical education. In outline this policy is as follows:

1.—To establish new medical schools as soon as conditions will allow, on the basis of one medical school for each province.

2.—To improve and extend such schools as were already established.

3.—To encourage the study of medicine and to maintain for the scientifically trained doctors a high social status.

4.—To cause to be organized at proper localities such institutions or facilities of investigation as will aid specialists in their research work.

5.—To regulate the practice of doctors trained in the traditional way, with a view to the unification of standards required of medical practitioners. (Full report, Ch. Med. Journ., 1920, p. 287.)

The last paper was read by Dr. C. V. Yui on "Statistics from Middle Schools in China teaching English and preparing Students for the Study of Medicine." He said that 685 out of 29,004 students in 153 government and private colleges intended to enter the medical profession.

The meeting adjourned at 10.30 p.m.

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TUESDAY, SECOND DAY OF CONFERENCE.

MORNING SESSION.

PEKING, FEBRUARY 24, 1920.

Following the devotional service, conducted by Dr. J. L. Stuart, the meeting was called to order by the President, Dr. C. J. Davenport, at 9:30 a.m.

The President stated that the meeting was open for the discussion of the papers dealing with the problems of mission hospitals in China read the previous morning.*

The minutes of the business of the preceding day having been read and passed, the President called upon Dr. A. S. Crawford to read his "Plea for the Adoption of a Uniform System of Case Records and Methods of Reporting Statistics in our Annual Reports." The speaker proposed a modified system of keeping hospital records for China and showed samples of charts, etc., he had been using.

* These papers with notes of the accompanying discussions will appear in the Hospital Supplement of the Ch. Med. Journ., 1920.
Dr. G. Hadden next read a paper on "The Training of Hospital Assistants." He held that it was unnecessary to insist upon expensive qualified assistants in the dispensaries, wards, or laboratories. In his experience, the average uneducated Chinese could make a reliable assistant under proper supervision and did very well as an aide, a colleague and technician.

Miss Nina D. Gage (Superintendent of Nurses, Peking Hospital) spoke on "The Training of Nurses" and warned her hearers against repeating the mistakes of the West in using women of the servant type and of the aggressively religious type, both types having proved unsatisfactory. It would be wise to begin straight away with the training of student nurses, who seemed to possess an intelligent appreciation of their work, and offered their patients not only sympathy but also skill. In China the training of nurses should be undertaken simultaneously with that of medical men and women.

A paper on "Follow-up Work" by Dr. Charles Lewis, was also on the programme.

BUSINESS SESSION.

The report of the Editor of the Journal was adopted as presented.

A committee of three—consisting of Dr. Allen C. Hutcheson (Nanking), Dr. John Snell (Soochow), and Dr. George Hadden (Changsha)—was appointed to consider the affairs of the China Medical Journal and make whatever recommendations it deemed necessary for the further development of the Journal, the Executive Committee being empowered to take immediate action in accordance with its recommendations.

Article IV of the Constitution and By-laws the C.M.M.A., was amended to read as follows:

The Executive Committee of the Association shall be composed of ten members made up as follows:

The President, Recording Secretary and Treasurer, Executive Secretary, the Editor of the Journal, one representative each of the Council on Medical Education, the Council on Public Health Education, and of the Publication Committee; the other three members shall be elected from the general body of members at each Biennial Conference. To facilitate the transaction of business the members of the committee, as far as possible, shall be chosen from among those stationed in, or near, one of the important political or business centres of China.

The Executive Committee so constituted shall have full authority to represent the Association during the intervals between Conferences, and shall have power to elect special committees from its own body or from among the general body of members, to fill any vacancies in the offices of the Association, or in any committee or council, and to take the initiative in all matters affecting the interests of the Association.
Article V of the Constitution was amended to read as follows:

Section 1.—In the event of any important subject arising between the biennial conferences requiring immediate action of the Association, the President and Secretary, on authority of the Executive Committee, may issue circulars calling for the votes of the members on the question at issue. The result of this vote, when counted by the Secretary, shall be announced to the members of the Association, and provided that out of a total number of not less than seventy-five votes cast, two-thirds shall be in favor of the motion, it shall be binding on all members of the Association. The columns of the Journal may be used for this purpose.

Section 2.—A Biennial Conference may, by a vote of not less than two-fifths of those present, submit any question before it to a general referendum as provided in the preceding section, and the result shall be binding on the Association.

By-law No. 7 was changed to read as follows:

Six members are to constitute a quorum of the Executive Committee. At least seven days' notice of a meeting shall be given to the members of the Executive Committee.

The Conference then passed a vote legalizing the actions of the Executive Committee in meetings which have been held during the past three years without a quorum.

The meeting adjourned at 12.00 noon.

SECTIONAL CONFERENCES.

Section on Anatomy and Anthropology.

The following demonstrations were displayed in the laboratories and remained on view during the Conference.

"Preparations of mitochondria in the somatic cells of Ascaris," by Dr. Shunichi Ono; "Preparations illustrating the effect of starvation and refeeding upon the mitochondria, the Golgi apparatus, and other cytoplasmic constituents," by Dr. Shunichi Ono; "Experimental alterations in the mitochondria of plant cells," by N. H. Cowdry; "Microscopic preparations of the interstitial cells of Sebright testes," by Dr. Alice M. Boring; "Schistosome larvae in man and other animals," by Dr. E. C. Faust; "The effect of feeding meat and fat upon the mitochondria in the acinus cells of the guinea-pig's pancreas," by Dr. Ma Wen Chao; "A demonstration of some of Professor Dogiel's original preparations of nerve endings," by Dr. Shunichi Ono; "Demonstration of the Paneth cells and yellow cells in the duodenum of pigs, cats, and dogs," by Dr. E. H. Tang.

The Innervation of the Soft Palate. M. Inouye, Department of Anatomy, Tokyo Imperial University, Japan. The results of Dr. Inouye's investigations, as shown in the charts and specimens exhibited, prove that the m. uvulæ is innervated, not from the pharyn-
geal plexus as described in current text books, but by way of the palatine nerves, ciliary ganglion and second division of the trigeminal. The passage of motor fibers to this muscle by way of the petrosal branch of the facial was excluded and movements of the palate were elicited by stimulation of the peripheral cut end of the trigeminal.

An address was given by Dr. Aleš Hrdlička on "Methods of Anthropometry."

The speaker dealt first with the selection and choice of material. He pointed out that much valuable information could be obtained by the use of even the simplest instruments but that all measurements must be in the metric system since that is the international standard. The use of the most common anthropological instruments was dealt with briefly and then a résumé of the methods of recording and analysing results was given. Finally, Dr. Hrdlička spoke of the use and value of photographic records and laid stress on the necessity of having clear full-face and profile photographs taken without the presence of any head dress or head covering. A circular containing a detailed account of the chief methods described will soon be submitted for publication in the CHINA MEDICAL JOURNAL.

Later in the afternoon Dr. E. H. Tang, the Director of the Government Medical School in Peking, read a paper in Chinese on "The cells of Paneth in the Duodenum of the Pig and other Vertebrates," which was followed by the reading in English by Dr. E. T. Hsieh of a summary of Dr. Tang's paper.

Dr. Hsieh presented a communication on the subject of the history of Chinese anatomy entitled, "A Review of Chinese Anatomy from the period of Huangti (Yellow Emperor, 2697 B.C.)." Numerous interesting illustrations of the quaint and philosophical conceptions of human anatomy current throughout this long period were shown, and the speaker pointed out that little or no advance had been made in this science since the Ming Dynasty for the reason that the accurate study of human material has at no subsequent date been possible.

The closing paper of the afternoon session was presented by Dr. J. H. Ingram on "Seal Characters with special reference to Anatomical Terms." Dr. Ingram's paper was of special interest in showing how anatomical and medical conceptions had influenced the evolution of many characters of the Chinese language.

**Section on General Medicine.**

Dr. B. E. Read (Peking) read a paper on the "Constituents of Chinese Urine," and showed charts comparing the various constituents
of the urines of Europeans, Bengalis, Singapore students, and of Chinese in Peking.

Statistics of Wasserman tests were supplied by Drs. R. H. Sia (Peking) and J. A. Snell (Soochow). At least 50 per cent of the positive cases gave no previous history of syphilis.

Dr. E. C. Faust showed specimens of intestinal parasites. Dr. E. S. Tyau told of a rare case of round-worm infestation of gall bladder and liver and exhibited the specimen.

Dr. E. C. Peake (Tientsin) showed under the microscope a new blood parasite he had discovered in patients, which seemed to be a hybrid between Leishmania and trypanosomes. Interesting comments were made by Drs. Preston Maxwell, Cadbury, Morris, Lennox, and Peter Kiang.

According to the programme there was also a demonstration of venous pressure apparatus by Dr. P. S. Evans.

Section on General Surgery.

Demonstrations of brain and nerve structures were shown in the Anatomy Building; also demonstrations on blood-transfusion by Dr. J. H. Liu, and on “An X-ray Installation for the Small Hospital,” by Dr. Paul C. Hodges.

Dr. J. Heng Liu read a paper on “The Incidence of Abdominal Disease in China.”

Dr. W. E. Libby (Wuhu) read a paper on “Fistula in Ano.”

“Some Practical Points in the Surgical Treatment of Cervical Tumors,” was the subject of a paper by Dr. Paul J. Todd (Canton).

A paper on “The Use of Tuberculin in Surgical Tuberculosis,” was read by Dr. Thornton Stearns.

Section on Diseases of Ear, Nose, and Throat.

In this section an operative clinic was held by Dr. A. M. Dunlap (Peking) at 5 p.m.

EVENING SESSION.

The Joint Session of the China Medical Missionary Association and the National Medical Association was called to order by Dr. Wu Lien-teh, President of the National Medical Association, at 8.45 p.m.

The evening session was largely devoted to the consideration of problems of Public Health in China. Most encouraging addresses were delivered by Dr. S. Woo and Dr. Peter.

In presenting the Report of the Joint Council on Public Health Education (Ch. Med. Jour., 1920, p. 186) Dr. Woo dealt with the
work of the last few years showing the immense strides that had been made in health education of the public and giving some idea of the amount of literature which had been circulated in China on this subject.

Dr. Wu Lien-teh expressed appreciation of the good work done by Dr. Woo in the cause of Public Health Education, and expressed the hope that it would be continued.

In a paper entitled "Our Constituency, Finances, Relationships, and Staff," Dr. Peter described his visit to America and the reception that he and his colleagues had met with in that country and in England. His report of the growth of interest in the work and the resolutions providing for the enlargement of the Public Health Executive and the admission of further bodies to the work were heartily approved.

Dr. Clara Sargent made a brief statement of the plans for "Health Education in Girls' Schools and among Women and Children." Dr. Li of the Y. M. C. A. spoke of the part taken by that body in the work of Public Health Education.

Executive Session, C. M. M. A.

On motion it was voted that the members of the C. M. M. A. go into Executive Session.

A resolution concerning the action taken by the Foreign Missions Conference of North America on Health Education in China was proposed and adopted.

The revised Constitution for the Joint Council on Public Health Education was adopted as revised. On motion it was voted that the Y. M. C. A. and the National Medical Association be notified of this revision for the purpose of their acceptance, and that all other interested organizations be notified of the revision.

Dr. H. J. Howard, on behalf of the Peking Branch of the C. M. M. A., presented a report on "Health Education in Schools of Higher Learning in China" in which a scheme was presented for reaching the schools and colleges of Peking by means of specially arranged health lectures, and urged that an attempt should be made to reach in the same manner the schools and colleges of the whole country.

At Dr. Howard's request, Dr. J. L. Stuart, President of the Peking University, made a statement as to how the University is preparing to put the Peking plan into execution.

Dr. W. W. Peter stated the present plans of the Joint Council on Health Education and made the gratifying announcement that over $6,000 had been pledged annually for five years for the support
of the work. An earnest appeal was made to the delegates to visit the exhibits which had been prepared and a very pleasant evening was closed with cinematograph display of a comedy dealing with health problems.

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WEDNESDAY, THIRD DAY OF CONFERENCE.

MORNING SESSION.

PEKING, FEBRUARY 25, 1920.

Following the devotional service, conducted by Dr. J. L. Stuart, the meeting was called to order by the President, Dr. C. J. Davenport at 9.20 a.m.

The President stated that the meeting was open for discussion of the papers of the previous morning, on "Mission Hospital Statistics and Records," by Dr. Crawford; on the "Training of Hospital Assistants," by Dr. Geo Hadden; and on the "Training of Nurses" by Miss Nina D. Gage.


Dr. Henry Fowler, the veteran worker among lepers at Siaokan near Hankow, read the first paper on "Reflections on Our Mission Hospital Problems," laying stress on the large extent of Chinese territory still uncovered by medical mission work.

BUSINESS MEETING.

In a paper on "The Health of Missionaries in China," Dr. Lennox (Peking) produced statistics to show the great neglect on the part of missionaries in China to look after their own health and the health of their children. Typhoid, dysentery, and smallpox were rampant among them and these diseases could be easily prevented by simple measures. The following resolution was passed:

WHEREAS, The health of the individual missionary and his family is essential to the success of the missionary enterprise; and

WHEREAS, The war has demonstrated the possibility of greatly reducing disease among the forces in the field through the use of modern methods of prevention and cure; and

* The papers with notes of the discussions will be published in the Hospital Supplement to the CH. MED. JOUR., 1920.
Whereas, Preventable sickness and death constitutes a continuing drain on the Christian forces in China; therefore

Resolved, That the China Medical Missionary Association should, and hereby does, call the attention of the missionary boards doing work in China to the need of an energetic, comprehensive, co-operative program, looking toward the physical well-being of the workers in the field. Among other items, such a program should include, first, the tabulation by the boards of their health statistics for the past, and where the records are inadequate, the installation of a system of vital book-keeping by means of which they and the doctors on the field may be in possession of the basic facts necessary for intelligent action.

Second, a thorough physical examination of candidates, with a greater degree of co-operation between examining physicians and doctors on the field.

Third, an annual thorough physical examination of every missionary with complete records of the same.

Fourth, more complete instruction of missionaries in the best means of guarding against disease in the section of the country in which they are to work.

Fifth, the securing for the missionaries of all the up-to-date means for the prevention of disease, such as regular vaccination against typhoid, paratyphoid, and small-pox, proper housing, screening, etc.

The China Medical Missionary Association especially offers its support in the planning and in the execution of any such forward-looking program, and it hereby directs its executive committee to lay this matter before the missionary boards doing work in China, and to act with the boards in any program which they may adopt.

The Secretary then read the Minutes of yesterday's meetings which were corrected and adopted.

Article III, Section 4, of the Constitution was amended to read as follows:

The Executive Secretary and the Editor of the Journal, after each has been elected to his respective office, shall each hold office until his resignation is accepted, or until removal for cause by a three-fourths majority vote at a general meeting of the Association.

Article VIII of the Constitution was amended to read as follows:

This Constitution can only be altered or amended at a general meeting of the Association when at least two months' public notice has been given in the CHINA MEDICAL JOURNAL of the amendment or alterations proposed, and the affirmative vote of three-fourths of the members present and voting at a general meeting of the Association shall be necessary for the adoption of any amendment or alteration.

A resolution regarding the appointment of a Council on Hospital Administration was adopted, and it was voted that the Nominating Committee be instructed to nominate this Council.

Dr. John Kirk presented a resolution from the Canton Branch of the C. M. M. A., regarding the establishment of Hospitals for the Insane. It was moved and voted that the Executive Committee be authorised to appoint a committee to consider the question of Hospitals for the Insane in Northern and Central China.

Dr. A C. Hutcheson presented a resolution from the ad interim Committee of the Southern Presbyterian Mission, urging the establish-
ment of a union institution for the care of the insane in the Yangtze Valley. It was voted to adopt this resolution and to refer it to the Committee to be appointed on Hospitals for the Insane.

The meeting then adjourned.

SECTIONAL CONFERENCES.

Section on Anatomy and Anthropology.

Meetings were held at 2.30 p.m. and again at 5 p.m. The following papers were read:

THE ORIGIN OF THE VITREOUS. Harvey J. Howard, Peking Union Medical College. Dr. Howard discussed the current theories regarding the origin of the vitreous in the light of his findings in an eye enucleated for suspected glaucoma, deducing evidence in favour of a double origin of the vitreous from mesodermal and ciliary sources. (The paper complete appears in the Anat. Suppl. to Ch. Med. Jour., July 1920.)

Discussed by Charles Lewis, Davidson Black, and E. V. Cowdry.

THE SECRETION OF URINE IN THE CAMEL. B. E. Read, Peking Union Medical College. The observations described were based upon the study during a period of three months of the urine of an adult female camel weighing 1,129 lbs. The speaker pointed out that his observations were as yet incomplete in many details and that further extensive work was planned both on this animal and on others. During ten days during which the animal was deprived of water, but not of solids, the volume of urine secreted daily fell from approximately 4,000 mils to 1,800 mils, and several days were required after water was again provided before the normal rhythm was established. Contrary to the observations of Leonard, this animal did not exhibit much evidence of water hunger at the expiration of its ten days of deprivation of fluid.

Discussed by Davidson Black.

THE APPLICATION OF X-RAY STUDY TO CERTAIN ANATOMICAL PROBLEMS. Paul C. Hodges, Peking Union Medical College. [Read by title.]

A REPORT ON THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY AND ITS RELATION TO BIOLOGY IN CHINA. The report contains a brief account of the history and organization of the Wistar Institute, the research work which is being carried out under its auspices and its activities in the publication of scientific journals. The very real service which the Institute is performing in the development of the sciences of
anatomy and biology in the Orient, through the distribution of journals free of charge, and by the training of Chinese students in the laboratories is described in detail. The report is written primarily for circulation in China and will soon be printed in Chinese and widely distributed.

THE BIRDS OF NORTH CHINA. G. W. D. WILDER, Peking.

THE COMPARATIVE ANATOMY OF THE MASTOID REGION. JUI HUA LIU, Peking Union Medical College.

The results of a preliminary survey of this anatomical region in representatives of several classes of vertebrates were described with a view to the delimitation of a specific problem for further study.

Discussed by Aleš Hrdlička and Davidson Black.

THE ENDOCRANIAL ANATOMY OF ORHODON (preliminary report). DAVIDSON BLACK, Department of Anatomy, Peking Union Medical College.

THE RELATION OF THE INTERSTITIAL CELLS OF THE REPRODUCTIVE ORGANS TO SECONDARY SEX CHARACTERS IN THE DOMESTIC CHICKEN. ALICE M. BORING, Peking Union Medical College, Peking.

(For Abstract see Anat. Suppl. to Ch. Med. Jour., July 1920.)

PROBLEMS UNDER INVESTIGATION IN CONNECTION WITH THE COLLECTION OF HUMAN EMBRYOS. E. V. COWDRY.

Read by title.

In this paper the author states that he is engaged in studying Chinese embryos and fetuses with the object of determining the normal growth curves of the different organs and parts of the body and to compare them with American and European standards. Speaking on behalf of the members of the Department with which he is connected in the Peking Union Medical College he pleads for the co-operation of physicians in China and says there are three pre-requisites to success in this work in embryology: (1) material, (2) organization, and (3) co-operation.

1.—Embryos and fetuses which are ordinarily thrown away are of the greatest value to us. We need them in large numbers in order to establish our results on a sound basis. Suitable mailing cases have been prepared, and we shall gladly defer any expenses incurred in collecting specimens and sending them to us.

2.—A large collection demands the full time services of a skilled embryologist whose duty it shall be to organize the work on an efficient basis. Steps are being taken to secure a man of this type.
3.—And finally all our efforts will be handicapped at the outset unless we can secure the enthusiastic co-operation of members of the medical profession who shall be sufficiently interested to come and work in our laboratories and take an active part in the solution of the problems which confront us.

(For complete paper see Anat. Suppl. to CH. MED. JOUR., July 1920.)

General Medicine.

In this section the following papers were read and discussed.

"Present Status of the Tuberculin Treatment of Tuberculosis," by Dr. Venable (Kuling). (CH. MED. JOUR., 1920, p. 236.)

"Out-patient Treatment of Tuberculosis," by Dr. J. A. Snell (Soochow).

"Blastomycosis," by Dr. L. H. Braflaadt (Tsinan).

"Some further Studies in the Intravenous Use of Typhoid Vaccines," by Dr. W. W. Cadbury (Canton).

"Antimony in Kala-azar," by Dr. J. H. Wylie (Paotingfu).

Section on Orthopedic Surgery.

A paper on "Fractures of the Femur, their Diagnosis and Treatment," was read by Dr. J. C. McCracken. (For full report with discussion, see CH. MED. JOUR., 1920, p. 230.)

Dr. Way-sung New read a paper on "The use of boiled beef Bone as transplants in Tuberculosis of Spine and as internal splints in reduction of Fractures." (Jour. Nat. Med. Assoc. of China.) He also gave a demonstration of the technique in the application of plaster of Paris bandages. Numerous surgical instruments and other hospital appliances were on view.

Section on Ophthalmology.

In this section the following papers were read and discussed.

1. Diseases of the Conjunctiva as met with in Tsinan. Dr. J. B. Neal (Tsinan).

2. Practical Considerations in Refraction. Dr. T. M. Li.

3. Ancient Chinese Treatment of Eye Diseases. Dr. Pi Hua-teh.

4. Two Cases of Paresis of the Superior Rectus with Tenotomy of the Inferior oblique. Dr. H. J. Howard, Peking.

5. A case of traumatic Cataract in one eye and simple Glaucoma in the other, both relieved by operation. Dr. C. A. Hayes.
EVENING SESSION.

The Joint Session of the China Medical Missionary Association and the National Medical Association was called to order by Dr. Wu Lien-teh, President of the National Medical Association at 9 p.m.

Dr. Wu Lien-teh introduced Dr. Ales Hrdlička, who delivered an address on "The Anthropology of Asiatic Peoples." A very large audience was present. After dealing briefly with the four main divisions of his subject, the speaker traced the history of Eastern races, and believed that in *Pithecanthropus* (Java man) could be found the first available evidence of man's descent from the ape. The neolithic man came next and both the Caucasian and Mongolian types could be traced from the same origin. In the learned doctor's opinion, the population of East Asia up to 5,000 years ago was represented by the yellow-brown race, best shown nowadays by the American Indian, which had evidently travelled along the coast-line of northeast Asia across the Behring Straits to their present habitat.

White and yellow men were closer to each other than were the black and negrito races. Neither Chinese nor Japanese are racially pure, both having a neolithic origin from the West, and a large substratum of white blood, as can still be seen in certain persons. The Koreans appear more Tartar-like than Chinese or Japanese. The Malays are mixtures of Hindustans, Chinese, and negritos. (Full report, Anat. Suppl. to *Ch. Med. Jour.*, July, 1920.)

In reply to many questions, the speaker advised doctors in China to join the newly-formed Anthropological Society, and take a share in discovering the anthropological treasures of China, which are still not touched. The meeting adjourned at 10.25 p.m.

THURSDAY, FOURTH DAY OF CONFERENCE.

MORNING SESSION.

PEKING, FEBRUARY 25, 1920.

Following the devotional service, conducted by Dr. J. L. Stuart, the meeting was called to order by the President, Dr. C. J. Davenport, at 9.15 a.m.

The following papers were read during the morning, one or two by title only:—The Surgical Treatment of Empyema, by Dr. A. J. Ludlow (Seoul); Surgery of a War Hospital in England (*Ch. Med. Jour.*, 1920, p. 358), by Dr. J. L. Maxwell (Formosa); Studies in
the Diet of the Koreans, by Dr. J. D. Van Buskirk (Seoul), who presented valuable data regarding the varieties of food and their caloric value of the Koreans, who are mainly vegetarians. Rice, barley, and beans are consumed in large quantities; fat and meat rarely taken, consequently dilatation of the stomach is a common complaint and the people are lacking in physical efficiency.

In a paper on "Some factors controlling the Food supply of China," Dr. B. E. Read (Peking) stated his belief that an enormous field could be tapped in this country for supplying the world with footstuffs, e.g., tea, wheat, eggs, bean-curd, dried fruit, meat, fish, etc.

"Studies in the Diet of the Chinese," by Dr. S. D. Wilson (Peking). The author presented (1) lists of food sold in the markets; (2) chemical analyses of such foods; (3) diet lists in hospitals and schools of China; (4) metabolism of Chinese. After comparing the nutritive values of bean-curd and cheese, he urged that missionary bodies should supervise the food of their pupils and improve its nutritive value. In many schools he found scarcely any protein or fat given, the diet consisting mainly of a little cabbage, white Chinese bread, white rice and some salt radishes!

The Nutritive Value of Soy Bean Products (CH. MED. JOUR., 1920) by Drs. Adolphe and Kiang (Tsinan).

Dr. T. Gillison presented the Report of the Publication and Terminology Committee (CH. MED. JOUR., 1920, p. 182).

Following a brief intermission, the following committees were elected on nomination by the Nominating Committee:


Committee on Hospital Administration: Drs. Henry Fowler, J. A. Snell, F. F. Tucker, F. P. Manget, Mary L. James, P. J. Todd, F. Auld, A. I. Ludlow, Miss Nina D. Gage, Miss Shackelton.
BUSINESS SESSION.

The Secretary read the minutes of Wednesday's meetings, which were adopted.

In accordance with the vote of the preceding day, Drs. J. H. Ingram, Andrew H. Woods, and A. C. Hutcheson were appointed a committee to consider the matter of Hospitals for the Insane in Northern and Central China. Later, the committee was empowered to coöpt two or three members from hospitals in the districts concerned.

The Medical Education of Women in China.

Certain specified questions relating to the establishment of medical schools in China for the education of women were now brought forward for discussion. This proved a most interesting subject, to judge by the length of time the Conference gave to its consideration, the keenness of the debates, and the closeness of the voting. For convenience all the material is brought together here in the form of a brief sketch. The limitations of space prevent the numerous speeches and resolutions being fully recorded.

For several years there have been three medical schools in China for women, situated in Canton, Soochow, and Peking respectively. All were ineffectually struggling to reach the high standard of a first-class medical school. In 1916, the Peking Union Medical College, Peking, was declared open for the medical instruction of Chinese women, and, in 1919, it was decided to admit women to the Pre-medical School of the same institution but so far the female students in these institutions are very few.

In the United States the "Federation of the Women's Boards of Foreign Missions," among its numerous interests and activities has had for some time a special committee to consider the medical education of Chinese women. Later, this committee appointed a sub-committee to report on the advisability of establishing a Medical School for Women in Shanghai, the teaching to be in the English language.

The Council on Medical Education of the C. M. M. A., at the Conference held in Canton in 1917, among other resolutions submitted the following, which was adopted:

"That this Council endorses the movement to secure medical education for women under Christian control. It asks the three colleges (Canton, Soochow, Peking) now teaching women to consider whether further co-operation and concentration are not possible, and commends this question to the consideration of the incoming Council in consultation with those engaged in the medical education of women."
In due time this resolution of the C.M.M.A. was forwarded to the Women's Federation. It was not very favorably received as it was interpreted to mean there should be only one mission medical school for women in China. Those responsible for the Canton School decided it should not be closed. The questions remained, what should be done with the Peking School? Should the scheme be proceeded with for establishing a Women's Medical School in Shanghai?

Towards the close of 1919, an influential delegation of the Federation of Women's Boards came to China and a Conference was called in Shanghai of representatives of all the missionary societies of the Federation, and others in China particularly concerned were called in consultation. A medical commission was appointed to consider and report upon the subject of medical schools for women in China. The commission submitted two recommendations to the Conference: the first advised the continuance of the Peking School, but it should be staffed and equipped in accordance with the standard of "Grade A" (C. M. M. A.); the other, the eventual establishment of a Women's Medical School in Shanghai of the same high standard.

After an animated debate and by a close vote the Shanghai Conference decided that one union bi-lingual medical college for women should be established to serve the needs of northern and central China, including Fukien, leaving the site to be determined by the China Medical Missionary Association.

At the present Conference (1920) of the C. M. M. A., the Council on Medical Education in submitting its annual report, among other resolutions, proposed the following:

"4. That the Association endorses the recommendation of the Special Conference on Women's Work appointed by the Commission of the Federated Women's Boards of North America, to the effect that one bi-lingual Women's Medical School of high grade be staffed and equipped on a union basis, and refers the matter of its location to the Council with power to act."

This resolution was referred by the Conference to a special committee of seven, consisting of Drs. J. C. McCracken, Eliza E. Leonard, Mary L. James, Harriet Love, John Kirk, Duncan Main, and R. T. Shields, who were to meet with the appointed delegates and report at a later session.

On Thursday, the fourth day of the Conference, Dr. McCracken presented the report of this committee which recommended that the school should be in Peking, and in adhering to the previous recommendation that the teaching should be bi-lingual defined a bi-lingual school in China as one in which the instruction is given chiefly by means of the Mandarin dialect, but the students are taught English
and certain courses may be taught in English if this is found practicable.

After a discussion in which Drs. Love, Houghton, Stuckey, Shields, McCracken and Mr. R. S. Greene took part, the Conference decided that the formation in China of a bi-lingual school for the medical education of women is undesirable.

In the afternoon at 2 p.m. and again on Friday morning, the discussion on the remaining question, the site of the school, was resumed. Drs. Kirk, Johnson, Main, Houghton, Ellison, Cormack, Betow, Morris, McCracken, Hamilton, Leonard, Manderson, Hutcheson, Cundall, Goddard, Wigfield, Shields, Davenport, Maxwell, Stuckey, James, Peter, Woods, Mrs. Ufford and Mr. Proctor were among the speakers. Finally, the Conference voted that the Mission Boards concerned in the medical education of women in China should be urged to establish immediately one medical college for women in Northern and Central China, that the instruction should be given in the Mandarin dialect, and that the school should be located in Peking. (The voting on the location was by ballot, the number of votes for the different cities suggested being: Peking, 44; Tsianfou, 36; Shanghai, 1; Nanking, 1; Hankow, 3.)

It was voted that the action of the Conference be reported to the Federation of Women's Boards and all others concerned.

On the closing day of the Conference a resolution was also passed recommending to the Council of Federated Women's Boards that until the North China Union Medical College for Women is fully staffed and adequately supported no new medical school for the separate education of women under missionary auspices be inaugurated in China.

Reviewing the whole discussion it is very noticeable that beneath diversity of opinion as to the medium of instruction and as to the location of the school, almost all were opposed to the organization of a weak medical school, maintaining the essential principle that the medical education given to women in China should be of the highest possible grade with all the clinical advantages obtainable.

SECTIONAL MEETINGS.

Section on Anatomy and Anthropology.

Some Growth Changes in the Walls of the Thorax in the Human Fetus. C. K. Roys, Department of Anatomy, Shantung Christian University, Tsianfou. This paper consists of a careful series of measurements which were made, for the most part, in the Institute
of Anatomy of the University of Minnesota, the idea being to investigate the rate of growth in the fetal as contrasted with the better known embryonic stages of development. The results are graphically illustrated in an extensive series of curves which show the rates of growth in respect to the thoracic index, the length and diameter of the thorax, the infrasternal angle and other important points.

THE SURGICAL ANATOMY OF THE OVARY WITH SPECIAL REFERENCE TO THE BLOOD SUPPLY. S. J. KIRKEY-GOMES, Peking. [Read by title.]

CYTOLOGICAL RE-INVESTIGATIONS ON THE SOMATIC CELLS OF ASCARIS, WITH SPECIAL REFERENCE TO MITOCHONDRIA. SHUN ICHI ONO, Tokyo.

THE EFFECT OF STARVATION AND REFEEDING UPON THE MITOCHONDRIA AND OTHER CONSTITUENTS. SHUN ICHI ONO, Tokyo. The results of this investigation show that the mitochondria in the intestinal cells of various animals undergoes definite alterations on inanition.

THE EFFECT OF RADIUM ON CELL DIVISION. CHAS. PACKARD, Peking Union Medical College. The investigations now in progress are planned with a view of determining how radium radiations affect cell metabolism. Previous studies have shown that the rays may stimulate cells to divide at a faster rate than normal, or may retard their cleavage, the difference in reaction depending on the physiological state of the cell at the time of radiation. In general, cells are most sensitive when they show the highest rate of metabolism.

THE PRESENT STATE OF THE SCHISTOSOME PROBLEM. E. C. FAUST, Peking Union Medical College. The author remarked that the Schistosome problem is probably as old as the human race, Ruffer having discovered Schistosome eggs in the kidneys of Egyptian mummies (1250-1000 B.C.). He then outlined the occurrence of Schistosomes in different parts of the world, referred briefly to some recent work of his own on some Japanese, South African and South American specimens, and concluded by mentioning certain practical points of diagnosis.

Discussed by Shun Ichi Ono and E. C. Faust.

A STUDY OF THE DIFFERENTIATION OF BLOOD CELLS IN THE BONE MARROW WITH THE AID OF JANUS GREEN AND OTHER SUPRA-VITAL DYES. E. V. COWDRY, Department of Anatomy, Peking Union Medical College. [Read by title.]
Section on General Medicine.

Drs. J. W. H. Chun (associated with Dr. Wu Lien-teh) read a paper on the treatment of cholera, dealing particularly with the management of the cholera epidemic in Harbin.

Dr. Braafladt (Tsinanfu) read a paper on the same subject and gave an analysis of 100 cases seen at Tsinanfu. He urged the extensive use of kaolin (aluminum silicate) in the treatment of cholera. (China Med. Journ., 1920, p. 243.)

Dr. P. T. Watson (Penchow, Shansi) read an interesting paper on bubonic plague in Shansi. He doubted whether rat fleas were essential to the transmission of plague, and thought that human fleas might transmit it direct from one person to another. He recommended that more widespread measures should be taken to prevent epidemics of bubonic plague.

In a paper on “The Dangers from Unhealthy Servants,” Dr. McCracken stated that among the Shanghai servants he found the following infections: gonorrhoea, 3%; syphilis, 11%; trachoma, 13%; tuberculosis, 3%. He recommended foreign housekeepers and foreign firms to ensure the health of their employees by having them regularly examined by qualified physicians. In Shanghai work of this kind was done at St. Luke’s Hospital, a small charge being made annually for each employee.

Dr. Tyau spoke on the same subject.

The following papers were also read and discussed:

Toxic Goitre in Orientals. By Dr. W. B. Russell.


Section on Obstetrics and Gynecology.

The following papers were read and discussed, one or two by title only.

The Treatment of Uterine Fibroids. By Dr. Way-ling New.

Nitrous-oxide-oxygen Anaesthesia. By Dr. McKesson.


Scopolamin and Morphine Amnesia in Labor. By Dr. Mildred Jenks.

Dr. J. Heng Liu gave a demonstration of surgical pathological specimens.
In this section the following papers were read and discussed:

Treatment of Eye Diseases among large bodies of Men, based upon Experience in France. By Dr. E. J. Stuckey.

The Blind Sorrow of China. Dr. G. Montague Harston.

Intracapsular Operations for Cataract. By Dr. H. J. Howard.

A uniform Schedule of Tests for a complete eye Examination, proposed for adoption by the Ophthalmologists in China. By Dr. H. J. Howard.

Visual requirements of Aviators in the light of War Experience. By Dr. H. J. Howard.

EVENING JOINT SESSION.

The Joint Session of the China Medical Missionary Association and the National Medical Association was called to order at 9 p.m., by Dr. Wu Lien-teh, the President of the National Medical Association. He then gave an address on "The Latest Phase of the Narcotic Problem," in which he showed figures representing the enormous increase of morphine injection in China brought about by unscrupulous Japanese traders and British and American morphine manufacturers. The figures had increased from 200,000 oz. (5½ tons) in 1911, 500,000 (14 tons) in 1914, to nearly 1,000,000 oz. (28 tons) in 1919. He urged his colleagues to take every possible step to stamp out this evil and to look upon the anti-morphine campaign in the same way as anti-venereal and anti-plague work.

Mr. Blanco spoke briefly on the same subject.

A resolution was subsequently passed calling attention to this evil in the following terms:—

That the China Medical Missionary Association and the National Medical Association of China in joint session held at Peking on February 26, 1920, having clear evidence of the alarming dimensions of morphia and kindred imports into China, are convinced of the urgency for immediate action being taken with a view to preventing the continuance of such traffic. They are strongly of opinion that nothing short of the control of the production of opium and the limitation of manufacture of morphia and other derivatives to a quantity not exceeding that necessary for legitimate medical purposes can eradicate this evil.

Dr. F. C. Yen read a paper entitled "A Campaign against the Hookworm."

The Meeting adjourned at 10.00 p.m.
FRIDAY, FIFTH DAY OF CONFERENCE.

MORNING SESSION.

PEKING, FEBRUARY 26, 1920.

Following the devotional service conducted by Dr. J. L. Stuart, the meeting was called to order by the President, Dr. C. J. Davenport at 9.30 a.m.

The secretary read the minutes of the meetings of the preceding day which were adopted.

Mr. Roger S. Greene, Resident Director of the China Medical Board, spoke briefly in appreciation of the presence of the Conference in Peking.

The secretary proposed the following resolution:

That the hearty thanks of the C. M. M. A. Conference be conveyed to the authorities of the Peking Union Medical College. During the past week the members of the Conference have experienced no ordinary kindness in the arrangements made for their entertainment, the provision made for the efficient carrying on of the meetings, and the thoughtful interest shown by the C. M. M. A., in the well-being of the visitors; it looks forward to the time when, the buildings having been completed, the College will enter on its full work, and it offers most hearty good wishes for its future success.

The resolution on a rising vote was unanimously passed.

The business deferred from the previous day, regarding the Women's Medical College, was then resumed and concluded.

Resolutions.

Professional Courses during Furloughs.

Whereas, Professional post-graduate courses or similar professional work are essential for the physician if he is to keep abreast of the times and his opportunities,

Resolved, That the Association reiterate its judgment that its members should be granted sufficient time on furlough to pursue graduate courses, either in China or at home, not less frequently than every five years, and be it further

Resolved, That the C. M. M. A. secretary call the attention of the missionary boards to this desideratum.

Proposed by F. F. Tucker.

Approved.

Aid to the Canton Hospital.

Dr. John Kirk (Canton) presented a series of resolutions, the gist of the matter being contained in the following:

4. That this Conference endorses the programme formulated by the Board of Directors of the Canton Medical Missionary Union for the sending of a deputation of members of the Hospital Staff to visit the home countries this year with the object of consummating the plans for reorganization above indicated, as well as
assisting in the securing of means for erection of new buildings with modern equipment which are so urgently needed for the prosecution of the Hospital's work.

Approved.

Papers on "Mission Hospitals" and "Health of Missionaries."

In order to give greater publicity to the "Survey of Mission Hospitals" by Dr. Balme, and to the paper on "The Health of Missionaries," by Dr. W. A. Lennox, it was proposed that in addition to their appearance in the China Medical Journal, the Chinese Recorder should be asked to publish these papers.

Approved.

Health Education in Chinese Schools.

A resolution proposed by the Peking branch of the C. M. M. A., recommending institutions of higher learning in China to incorporate courses of public health and social service in their curricula, was adopted with the report annexed, and it was voted that the Executive Committee of the C. M. M. A. should take steps to secure the adoption of this recommendation in all the institutions of learning in China.

Wellcome Trust Fund.

Resolved, That the China Medical Missionary Association records its hearty thanks to Mr. Henry S. Wellcome for his willingness to end the Wellcome Fund Trust and to continue the Fund as an aid to the work of the Publication Committee of this Association.

Approved.

Aid given by China Medical Board to Publication Committee.

Resolved, That this Conference of the China Medical Missionary Association tender its hearty thanks to the China Medical Board for its generous help to the Publication and Translation Committee during past years and for still further increasing our thankfulness by signifying its intention of granting $10,000, Mexican, annually for the two ensuing years and thus materially helping us in our endeavor to supply up-to-date medical works to the Chinese in their own language.

Approved.

Committee on Publication and Translation.

Resolved, That the Committee on Publication and Translation be authorised to elect its own Executive. That this Executive shall have power to meet for the transaction of business, and that the minutes of such meetings shall be circulated among the members of the Committee then resident on the field, and that all items receiving a two-thirds majority of the votes cast shall be regarded as having the official sanction of the Committee.

Proposed by Dr. T. Gillison. Referred to Executive Committee.
Mission Boards and Missionary Physicians.

Resolved, That this Conference deems it highly desirable that medical men and women should be asked by the home churches to serve on the Governing Boards of Foreign Missions, and urges the home churches which have not already done so, to take steps to this end;

It also regards it as desirable that the churches should organize Medical Missionary Auxiliaries, composed of medical men and women, nurses, and others interested in medical mission work, in order to ensure the efficient and satisfactory support and control which is needed at the present time and directs the Secretary to forward a copy of this resolution to each Missionary Board engaged in working in the China Mission Field.

Proposed by Dr. T. H. Coole.

Ministry of Health in China.

A resolution urging the Chinese Government to establish a Ministry of Health was adopted.

Prevention of Bubonic Plague.

A resolution recommending the more widespread vaccination of the Chinese people against bubonic plague and suggesting that the Manchurian Anti-Plague Bureau should extend its activities to other parts of China, was laid on the table.

Hospital Accounting and Recording.

Resolved, That the Executive Committee of the China Medical Missionary Association be authorized to adopt and recommend for use in mission hospitals a uniform system of accounting and recording.

Proposed by Dr. H. S. Houghton. Referred to Executive Committee.

Distribution of Red Cross Supplies.

A resolution was adopted which requested the Executive Committee to appoint a committee to investigate the sale of Red Cross Supplies now being offered in the United States.


Resolved, That the Secretary of the China Medical Missionary Association enter into correspondence with the Secretary of the American Medical Association, to see if some means may be devised whereby members of the China Medical Missionary Association, who have in some State in the United States a license to practise medicine, may apply for membership in the American Medical Association without joining the county and state medical societies as is now necessary.

Approved.

Medical Missionary Work in North China.

A resolution was adopted urging missionary societies to strengthen the medical missionary work in Kansu, Shensi, and Inner Mongolia.
The China Medical Journal.

X-ray Committee.

A resolution proposing the appointment of a special X-ray Committee was referred to the Committee on Hospital Administration.

Hospital Records Committee.

A resolution proposing the appointment of a special committee to devise a simple and uniform system of hospital records, was referred to the Council on Hospital Administration.

The Use of Alcohol.

A resolution on the use of alcohol in pharmacy and in the treatment of disease was laid on the Table.

The Training of Hospital Assistants.

A resolution on this subject, proposed by Dr. Geo. Hadden, was referred to the Executive Committee.

Next Conference (1922) in Shanghai.

An invitation from the Hongkong and China Branch of the British Medical Association to the C. M. M. A., to hold its next Conference in Hongkong was read, and the thanks of the Conference extended to it.

It was voted, however, that the next Conference should be held in Shanghai.

Votes of Thanks.

The following votes of thanks were passed unanimously, the resolutions being fully recorded in the minutes of the Conference.

To the Chinese authorities for the courtesy and kindness shown to the delegates.

To the Chinese Continuation Committee for its interest and help.

To Dr. J. L. Stuart for conducting the devotional services during the Conference.

To the Peking Branch of the C. M. M. A., for their hospitality.

To all in Peking who have entertained the delegates, including medical students and nurses.

To all who have conducted delegates on the various excursions.

To Miss Barchet and other members of the office force for their assistance to delegates.

To Drs. Beebe, Merrins, Morris, and Woo for their services to the Association during the triennium.

To Dr. Cecil J. Davenport, the retiring President.
Reception to Members of Conference by President of China.

President Hsu Shih-chang received the delegates and their families in the Palace at three o'clock in the afternoon. Addressing the 400 guests he referred to the great humane work which they had been doing throughout China. He assured them of his sympathy and support and hoped they would take back with them pleasant recollections of their visit to Peking. (For full report of Address, both in Chinese and English, see CH. MED. JOUR., 1920, p. 284.)

Dr. C. J. Davenport replied on behalf of the Medical Missionary Association (CH. MED. JOUR., 1920, p. 285) and Dr. P. Kiang on behalf of the National Medical Association. Dr. Wu Lien-teh then introduced the two new Presidents of these Associations, Dr. Johnson and Dr. C. Voonping Yui.

Tea and light refreshments were next supplied, and the guests visited various apartments of the Palace and roamed about the spacious gardens. They viewed the noted island where the unfortunate Manchu Emperor, Kuang Hsu, was imprisoned for eight years until his death in 1908. The private apartments of the Empress Dowager, Tsu Hsi, were visited, also her death chamber and the palace of her favourite eunuch, Li Lien-ying.

Election of Officers.

The following members were elected unanimously to the offices of the Association.

President, C. F. Johnson,
Vice-President, Thos. Gillison,
Executive Secretary, R. C. Beebe,
Recording Secretary, H. H. Morris,
Editor, CHINA MEDICAL JOURNAL, E. M. Merrins.

Executive Committee of the Association.

The Executive Committee for the next biennium consists of the following members: Drs. Johnson, Beebe, Morris, Merrins, ex-officio; elected members:—Dr. C. J. Davenport, Shanghai; Dr. J. O. Thomson, Canton; Dr. J. W. Pell, Taiyeh; Dr. J. C. McCracken, Shanghai; Dr. H. S. Houghton, Peking; Dr. R. T. Shields, Tsinan.

AFTERNOON SESSION.

A little further business had to be transacted. A resolution was passed requesting the Executive Committee in consultation with the editor of the CHINA MEDICAL JOURNAL to issue some or all of the papers.
presented during the Conference in one separate volume to be offered for sale.

The report of the Recording Secretary and Treasurer was adopted. (CH. MED. JOUR., 1920, pp. 160, 161.)

The main part of the session was devoted to the discussion of the religious side of mission hospital work, Dr. D. M. Gibson (Kaifeng) presenting a paper on "Devotional Evangelism," and Dr. S. G. Peill on "Educational Evangelism."

A resolution was then passed that the Executive Committee be authorized to receive and confirm the Minutes of the proceedings of this the final day of the Conference. There being no further business, this concluded the formal proceedings.

EVENING ENTERTAINMENT.

In the evening a grand banquet to the delegates and their friends was given by Premier Chiu Yun Peng and Admiral Sah at the Army Medical College. The large dining hall was beautifully illuminated and there was a fine display of uniforms and decorations. The Naval Band was in attendance. In the absence of the Premier, Admiral Sah presided, and gave the following address of welcome to the guests.

We live in an age of unceasing competition and discovery in all departments of science. To medical science especially is this statement applicable. There are numbers of brilliant Western scholars who spend their lives in seeking to bring to light fresh discoveries of means to prevent disease and in the art of healing. Thus suffering is ameliorated not only in their own countries, but all over the world. The distinguished doctors now present from every part of the country, feeling that there is yet much to be learned, have come together in conference to discuss weighty professional matters and inspire each other to still further efforts in medical research. Both Associations have met daily; and after considering the subjects under discussion we look to the result of this Conference with profound gratitude and expectation.

Therefore it is with much pleasure that Premier Hsi Yuin-pen and I, Sao Chen-pin, representing the Government of China on this occasion, have come to the Conference to shake hands with each member, and express this gratitude, as well as to give them a hearty welcome to Peking. The records of the past decades shew to us Chinese what great things our brethren the doctors are doing for our country in every province. They manifest in every action the true love of mankind; and the works of charity done amongst the poor and sick, evince on their part the genuine altruism which puts others' good before one's own. Our Chinese Government feels this deeply, and it is for this reason we call on all present now to raise their glasses and drink to the health and the yet further usefulness of the two Associations in meeting the great medical opportunities that lie before them in our Republic of China.

Some public health moving pictures were afterwards thrown on the screen much to the amusement of those present.

Thus ended the proceedings of the Conference so far as they can be recorded here. It was certainly the largest conference the C.M.M.A.
has ever held, and in the number and quality of the papers read and
the discussions thereon, the spirit of comradeship and brotherly helpful­
ness which prevailed, and the marked friendliness shown by high
Chinese officials, it was one of the most successful. The next
Conference will be held (D.V.) in Shanghai, early in 1922.

CHINA MEDICAL MISSIONARY ASSOCIATION
CONFERENCE.
PEKING, FEBRUARY, 1920.

List of Delegates:

Adams, W. F., Yachow
Adolph, W. H., Tsinan
Anderson, A. G., Wonju, Korea
Andreasen, S., Language School, Peking
Auld, F. M., Weihwei, Ho.

Baldwin, J. H., Changli
Balme, Harold, Tsinan
Bash, Clementine, Peking
Beall, Jeanette, Language School, Peking
Behrents, O. H., Kioshau
Bert, A. E., (Hengchow) Changych, Hunan
Bethell, S. E., Language School, Peking
Betow, Emma J., Sienyu
Bigger, J. D., Kangkei, Korea
Black, Davidson, Peking
 Bliss, Theodore, Wuchang
Bradfield, O. H., Tchchow
Braaadal, L. H., Tsinan
Branch, J. B. B., Changsha
Brubaker, O. G., Laochow, Shansi
Brunemeir, E. H., Tungjen, Kweichow
Bryan-Brown, D. S., Peking
Buswell, A. E., Tongchow, Shantung

Cadbury, W. W., Canton
Carr, John, Pingyang, Shansi
Carr-Harris, F. F., (Weihwei) Language School, Peking
Coole, T. H., Kutien
Cormack, J. G., Peking
Cowen, Agnes M., Asilhu
Cowdry, K. V., Peking
Crandall, Grace, Luiho, Ku.
Crawford, A. S. (Changsha) Language School, Peking
Crawford, F. R., Kashing
Cundall, Edward, Anlu
Cunningham, Frances M., Pingyin, Shantung
Cutler, Mary M., Pyengyang, Korea

Davenport, C. J., Shanghai
Dickson, John R., Shantung
Dow, Jean L., Changteh
Dunlap, A. M., Peking
Ellis, J. S., Tsinan
Ewers, E. M., Nanking

Faust, E. C., Peking
Fedde, Nathaniel, Kioshau
Fletcher, A. G., Taiku, Korea
Follwell, E. D., Pyengyang, Korea
Ford, R. Kelson, Language School, Peking
Fowler, Henry, Siaokau, Hupeh
Garner, M. Emilv, Shanghau
Gaston, James M., Laichow
Gibson, D. M., Kaiyeng
Gillson, T., Tsinan
Goddard, F. W., Shao-hsing, Che.
Grant, J. S., Nikko

Hadden, George, Changhai
Hadden, R. P., Patsham
Hamilton, Annie L., Shanghau
Hamilton, Guy W., Shantung
Hanuestad, K., Kaigan
Harding, B. M., Ichowfu
Hayes, C. A., Canton
Heinburger, L. F., Weilsien
Helliwell, Paul V., Linching
Hewat, Helen G., Mukden
Hinkhouse, Myrtle J., Peking
Hirst, J. W., Seoul, Korea
Hodges, P. C., Peking
Hornig, D. L., Language School, Peking
Houghton, H. S., Peking
Howard, Harvey J., Peking
Hoyte, Stanley, Pingyang, Shansi
Hutchinson, Allen C., Nanking

Ingle, L. M., Tsinan
Ingram, J. H., Peking
James, Mary Latimer, Wuchang
Jenkins, Mildred, Canton
Johnson, C. F., Tsinan
Jordan, C. F., Nanking
Keeler, J. K., Shanhaikuan
Kirk, John, Canton
Korns, John H., Peking
LaForce, W. B., Tsinghua Yuan, Peking
Landis, C. C., Shanghai
Larsen, L. K., Antung
Leach, Charles D., Huchow
Leach, Clara, Swatow
Leadingham, R. S., Mokpo, Korea
Lennox, W. G., Peking
Leonard, Eliza E., Peking
Lewis, Charles, Paotingfu
Lewis, Elizabeth, Shuntehfu
Li, T. M., Peking
Libby, W. E., Wuhu
Lindorff, O. W., Huchow, Honan
Love, Harriet, Soochow
Love, A. Houghton, Tsungshien, Chihli
Ludlow, A. J., Seoul, Korea
Mackay, Maud A., Paotingfu
Main, Duncan D., Hanghai
Manderson, Mabel M., Peking
Mauget, F. T., Huchow
Mansfield, T. D., Wonsan, Korea
Martin, S. H., Yong Jung, (Korea Mission) Manchuria
Maxwell, J. Preston, Peking
McBurney, Kate, Takking
McCracken, J. C., Shanghai
McDonald, F. K., Peking (Changli)
McDonald, Jessie, Kaifeng
McTavish, Isabelle, Changteho
Menzie, J. R., Hwaikung, Ho
Merrow, Llewella M., Nanking
Miller, Ida M., Tientsien
Miles, Lee M., Teihchow
Moore, E. H., Mukden
Morris, H. H., Shanghai
Murdoch, Agnes G., Hwaianyan, An.
Niebel, B. E., Liling, Hunan
Oechsli, W. R., Tainanfu
Patterson, J. B., Kunsan, Korea
Peak, E. C., Tientsin
Pederson, Nellie, Language School, Peking
Peill, S. G., Tsangchow
Pell, J. S., Hankow
Percy, T. Watson, Fengchow, Shansi
Perkins, E. C., Kiukiang
Peter, W. W., Shanghai
Phillips, E. Margaret, Peking
Price, R. B., Taichowkun
Read, Bernard E., Peking
Reid, W. T., Songdo, Korea
Robbins, Emma E., Chinkiang
Rogers, J. M. L., Soochun, Korea
Ross, J. B., Wonsan, Korea
Russell, W. B., Changchow, Ku.
Sargeant, Clara A., Shanghai (Language School, Peking)
Selmon, A. C., Shanghai
Seymour, W. F., Tsinan
Schmaltzried, B., Nanking
Sharrock, A. M., Syenchun, Korea
Shields, R. T., Tsinan
Shoemaker, Arthur, Peking
Smith, D. V., Peking
Smith, G. F., Syenchun, Chihli
Smith, R. K., Andong, Korea
Snell, John A., Soochow
Stearns, Thornton, Tsinan
Stevenson, Paul H., Shunwofu, An.
Stewart, Mary, Seoul
Struthers, E. B., Tsinan
Strykes, Minnie, Peking
Stuckey, R. J., Peking
Taylor, H. B., Anking
Taylor, R. Y., Yangchow
Taylor, W., Chinkiang, Korea
Thomson, J. Oscar, Canton
Tipton, S. P., Syenchun, Korea
Trimbles, C. G., Yenping
Tucker, F. F., Teihchow
Van Buskirk, J. D., Seoul, Korea
Wallace, M. B., Loting, Kwangtung
Wampler, F. J., Pingtingehow
Walch, R. A., Yulhsien, Hunan
Whitmore, Clara B., Shanghai
Whitney, H. C., Chaiyung, Korea
Wilno, F. A., Nanking
Wilson, R. M., Guangfu, Korea
Wilson, Stanley D., Peking
Woods, J. B., Tsingkiangpu
Wylie, J. H., Paotingfu
Yocum, A. W., Pingtu
Young, A. R., Tieling
Young, M. P., Soochow

Present by Invitation:
Baxter, D. E., M.D., Peking
Beaty, Elizabeth, M.D., Shanghai
Britland, A. J. D., Peking
Bussiere, A. J., M.D., Peking
Cowdry, N. H., Peking
Dittmer, G. C., Tsiungkin, Peking
Earle, H. T., M.D., Hongkong
Embrey, Hartley C., Peking
Fairburn, Mrs. Paula, M.D., Peking
Fette, G. C., Peking
Forryth, J. M., M.D., Glasgow
Gray, G. Douglas, M.D., Peking
Green, Roger S., Peking
Abandonment of Shanghai Medical School Project.

At a meeting on April 28, 1920, the China Medical Board of the Rockefeller Foundation decided to abandon its project for the establishment of a medical school at Shanghai.

The principal reasons for this change of plan were the changed world situation and the unexpectedly high cost of all its enterprises in China, due to the exchange and the enhanced prices of building materials and equipment. It has been found necessary to spend for the construction, equipment, and in particular for maintenance of the school at Peking larger sums than it had been thought in 1914 would be necessary for the two schools together. At the same time schools in other parts of the world have been placed in an extremely difficult position through the increased cost of living abroad and the depreciation in effective value of their endowments. This comes at a time when many of the medical schools of America and Europe are crowded with greatly increased numbers of students and badly need new buildings and equipment.

While it appears likely that within a comparatively few years there will be a sufficient number of highly qualified medical students to
justify the existence of a second school, many members of the Board felt that at the present time, when the capacity of the Peking school has not yet been reached, it would be difficult to justify the establishment of a second school in China, requiring for its proper organization a large staff of the highest order and considerable sums of money, both of which are needed for schools in America and Europe, already possessing a large attendance of well-prepared students, but lacking in suitable teachers and in funds. It is known that the Rockefeller Foundation has recently decided to make a grant of several million dollars for the promotion of medical education in London, and plans are practically complete for similarly substantial aid to medical schools in Canada. Certain schools in the United States that have great promise for the future are also in need of help.

In these circumstances the Board would probably have favored a somewhat indefinite postponement of the Shanghai project rather than its complete abandonment, but it was aware that others were interested in the development of medical education in the same region and that indefinite postponement might seriously embarrass these other interests in their efforts to secure men and money with which to carry out their plans. The idea of postponement was, therefore, given up in favor of definite abandonment of the project.

The action taken does not imply any slackening of the Board's interest in its work in China. The school in Peking will be developed as rapidly as possible, and every effort will be made to hasten in other ways the progress of medicine in China, with due regard to the funds available and the relative urgency of appeals from different parts of the world.

SCIENCE LABORATORY BUILDING, ST. JOHN'S UNIVERSITY, SHANGHAI.

The corner-stone of the new Science Laboratory Building for St. John's University was laid by Bishop Graves on the morning of Commencement Day, June 26th, 1920.

The inscription on the stone reads:

SCIENCE LABORATORY BUILDING
Donated by
CHINA MEDICAL BOARD
of the
ROCKEFELLER FOUNDATION
ERECTED 1920
The building was designed by Murphy and Dana, architects. It is a three-story structure having a frontage of 150 feet and a depth of 50 feet and will provide for the pre-medical work in Physics, Chemistry, and Biology.

The department of Physics occupies the first floor and in addition to the office of the department and the necessary rooms for the storage of apparatus there are separate laboratories for the work in Mechanics, Electricity, Light, Heat, and Sound.

The department of Biology occupies the second floor. The space provides not only for the general laboratory class-room and necessary office and storage space, but also for special laboratories for histology and bacteriology as well as a museum and library for the exhibition and preservation of specimens of interest to the department.

The department of Chemistry is on the third floor. As in the other departments, in addition to the general laboratory space and the necessary office and storage rooms there are special laboratories for the work in Quantitative Analysis, in Industrial Chemistry, and in Organic Chemistry.

Running through from the first to the second floor is a large lecture room which is available to all three departments for class demonstrations and lectures to audiences that are too large for the class-room space provided for each department separately.

In the basement is a boiler room, a dark room for photographic work, and a small work shop.

The building is made possible by the very generous grant made by the China Medical Board of Gold $80,000 to the University, which with Gold $20,000 given by the Episcopal Board of Missions in America provides for the construction of this new laboratory and its equipment as well as helping toward the maintenance of these three pre-medical departments for a short period.

It is hoped that in this new Laboratory may be trained many young men who later will enter a medical school, and building on the foundation here secured will become efficient and useful members of the medical profession in China.

Pre-medical Training.—We are convinced that a thorough grounding in the fundamental sciences of physics, chemistry, and biology cannot be too much insisted on. The scientific quality of all the later professional education of the student will depend on his grasp of principles and the extent of his general scientific knowledge. The foundation of this must be laid in his youth by a sound training in the elements of pure science. The great teacher can speak only to those who have ears to hear, to those whose minds habitually move in the same plane of scientific thought as his own. Observation, the foundation of all scientific knowledge, is blind unless the eye is informed by knowledge; it is observation "loaded with inference" that alone gives insight.—Report of Royal Commission on University Education in London.
A work has been conducted in Nanking that will appeal to all those who are looking for ways to co-operate with the Chinese in Public Health propaganda.

Dr. W. E. Macklin translated into Chinese the United States government instructions for promoting public health issued for circulation in the Philippine Islands. These instructions were simple, clear, and adapted to conditions similar to those in China.

The translation was shown to the Superintendent of Police in Nanking who recognized its value and immediately had one thousand copies published for distribution. He asked Dr. Macklin to accept an honorary position as adviser to the Public Health Department, supplying him with a writer. Further, all the police of the province are required to gather at Nanking in classes so that Dr. Macklin can give them lectures and definite instruction in methods of sanitary care of the city. In this work the University Hospital and the Chemistry department of the University co-operate by affording laboratory facilities and instructors. The local Y.M.C.A. also assists with moving pictures and lantern lectures.

The project has proved a very satisfactory way to benefit the city and province, as well as to strengthen the favor of the Chinese towards the work of missions.

It is probable that similar service may be rendered in many other cities.—R. C. B.

**Book Reviews.**


Which is the best comprehensive surgery for the missionary surgeon who is often obliged to operate without the assistance of skilled colleagues? A work written by a group of surgeons, each an expert in his particular department, who is almost sure to write with his fellow experts in mind and who will describe operations that require special instruments or apparatus, and more than ordinary experience? Or a surgery covering the whole field written by one man who has actually performed himself most of the operations advised, whatever their nature may be? Most surgeons in China, whose lot is not the happy one of being in a large, elaborately equipped hospital with numerous colleagues, will probably prefer the work written by one very competent general surgeon. This is the character of Warbasse's Surgery. The author is well aware that circumstances may surround both the surgeon and the patient which make the ideal measures of
Book Reviews

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the specialist impossible or inexpedient. Nevertheless, these ideal measures are described, but at the same time the author presents alternatives of treatment if the best possible cannot be employed.

Volume I has been previously reviewed in this Journal. Vol. II covers the surgery of the scalp, skull, eye, nose, throat, ear, spine, neck, thorax, heart and abdomen. Vol. III deals with hernia; the vermiform appendix; the liver and gall-bladder; genito-urinary organs; female generative organs; amputations and other operations on upper and lower extremities: plastic operations; electricity and radiation in surgical treatment; injuries from electric currents, radiation and gas-poisoning. All the operations are well and clearly described. Lastly, there is an appendix on various subjects making the work very complete. Each volume has its own index and there is a separate General Index. Missionary surgeons and others will find Warbasse's Surgery a good, solid work on which they may rely.


The dwindling birth-rate in Western countries is directing the attention of the authorities to the necessity of not only taking every legitimate means to increase the birth-rate, but also to preserve the health and secure the full development of the children that are born. In Great Britain the average infant mortality per annum is 130 per mille, whereas the death-rate of adults varies from 27 to 35 per mille. In India, China, and other eastern countries the infant mortality is very much higher; in fact, it is appalling. But the saving of child-life can only be successfully accomplished by the scientific study, among other matters, of the physiology of the child, not only from the time of birth as given in ordinary physiologies, but from the time of conception. Hence this work which takes the wider view indicated is most useful and interesting, as in dealing fully with ante-natal as well as post-natal physiology it covers much new ground.

The author divides his book as follows: (A) Anti-Natal: 1. Conceptional, which deals in an interesting manner with heredity and gives many points of information not easily found elsewhere. 2. Conceptional, describing the processes of fertilization. 3. Post-conceptional or intra-uterine. (B) Natal: describing the physiology of birth. Post-Natal: (I) Neonatal; (II) Infancy; (III) Childhood; (IV) Puberty. The physiology of the different organs and systems during each of these periods is entered into very fully.

Perhaps a little more might have been said of abnormal conditions in the ante-natal as well as post-natal period. It is true this is done to some extent, but it would be very interesting if it were carried further. The illustrations, graphs, and tables are numerous, and there are photographs of noted investigators in this branch of science. The book will be very useful to the physiological student for collateral reading as it is well that he should know wherein the physiology of the infant differs from that of the adult; also to specialists in pediatrics, and to all who are concerned in the investigation of means for preserving and developing the physical and mental health and development of the children of a nation.


The advantages of having a Standard Nomenclature of Diseases must be obvious to all as it facilitates medical study and discussion, and the interchange of ideas among physicians of different nationalities. The present work has been issued by the U. S. Government. It is divided into three parts: (1) List of Diseases and Pathological Conditions; (2) Injuries, Wounds, etc., by External Causes; (3) List of Poisonings and Intoxications. All the names are numbered and are arranged in alphabetic and numerical order, the preferred terms being printed in bold-faced type, synonyms being enclosed in parentheses. Every name in smaller type has a cross-reference indicating the preferred term.

Of course in a first edition there is bound to be room for improvement. There are omissions: for instance, we find no mention of thrombo-angitis obliterans, not uncommon in China, which is surely a clinical entity. The arrangement
might be a little better; where a term in small type comes first without a number and is followed by terms in large type with numbers, the leading word not being repeated, the connection is not at once evident (See "Spasm," Nos. 19146-19161). Should not the lesser terms be numbered also? "Killed in Action, Details not known" does not seem to be the name of anything in particular, though the phrase may be useful in compiling military reports. So we might go on, but there are better examples to criticize freely which will lead to the improvement of the work, and we hope that eventually it may be of an international character.

To the compilers of a medical terminology in Chinese the work should be very helpful as it will give strong support to the use of certain terms to the exclusion of others. To editors of medical papers it will be useful as a strong authority. One of our contributors, who writes very good papers, will persist in separating tics douleureux from the neuralgias. Next time he does this and complains afterward that his paper has been altered, we shall refer him to this Standard Nomenclature where he will find under the tics:—"Douleureux. See 14,276 Neuralgia, Trifacial." We hope this work will be followed by an authoritative "Classification of Diseases."

There is one criticism we must make of a somewhat unusual character as it refers to the cover of the book which is of green cloth. What the coloring material is composed of we do not know and have not the time to inquire; all we can say is that it is admirable for the culture of fungi. In the hot, humid climate of a Shanghai summer, three days were sufficient for the book to become thoroughly disreputable in appearance, the cover being like the skin of a mangy dog. Publishers ought to study this matter scientifically and issue books able to withstand the disintegrating influence of warm climates.

**Syphilis in General Practice, with Special Reference to the Tropics.**

The introduction to this book is by a British medical officer who does not believe in moral education as a means to prevent immorality and the spread of venereal disease. At any rate, in his opinion the moral education should be accompanied by instructions in the use of active measures of disinfection before, or immediately after, exposure to contagion. A queer moralist! Then there is a brief historical sketch by the author who refers to Old Testament personalities and incidents in a manner which must give deep offence to both Jews and Christians. For instance, David's sin with Bathsheba was bad enough, but what evidence is there for supposing, as the author does, that he contracted syphilis from her? Statements of this kind show a want of knowledge and judgment which prejudices one against the book from the start.

The fresh information in the book is not much. We learn that early marriages in India do little to lower the incidence of venereal disease. In tropical countries manifestations of syphilis are more common than elsewhere, which is hardly to be wondered at as nearly all skin diseases are common in the tropics. The author has discovered a new test for syphilis—the margosate precipitation test—but he gives no outside evidence of its value, and the same may be said of his treatment of the disease by margosates. The rest of the book keeps to the beaten track. There are several illustrations which are weird, if not positively ghastly. Doubtless the book will somewhere meet a long-felt want, but we think there are far superior books on the subject written by Westerners, which are better even for Indians.


This number of the Catechism Series deals with the upper and lower extremities. Students preparing for examination in surgical anatomy will find it very useful as the questions are among those likely to be propounded by sensible examiners, and the answers are sufficiently explicit. Numerous tables are given which make the work all the more helpful.

The aim of this little book is to serve as a guide to students and practitioners who wish to master the technique of diathermy—another name for electrical treatment by the high-frequency current—and to appraise its place in the treatment of disease. It rapidly sketches the history and theory of diathermy, shows how high-frequency currents are produced, describes the various forms of diathermy apparatus and the methods of application. For example, in surgery there are notes on the suprapubic method of operating diathermically on vesical papillomata, and on the diathermic treatment of malignant disease of the tongue. Other medical and surgical conditions in which the treatment is beneficial are recorded and these are much more numerous than many practitioners are inclined to admit by adopting or recommending the treatment. Undoubtedly the most successful results are obtained by experts, and the author deplores the state of affairs which permits anyone with a dry battery to give electrical treatment.


The author's experience has convinced him that medical students are not sufficiently interested during their medical course in diseases of the ear, nose, and throat, in comparison with the other subjects in which they must pass important examinations, and it is not until they engage in active practice that they realize their mistake. Hence this work has been written to stimulate their interest in this specialty.

The different methods of examinations are given and there is a brief but adequate description of the various diseases and other abnormal conditions of the nose, throat, and ear. The treatment advised is conservative yet quite up-to-date. Perhaps more might have been said of the difficulties and dangers of operations on the tonsils, which do not always arise from want of experience on the part of the operator. The book is a good one, especially for medical students and young practitioners.


Neuroasthenia is on the increase. This bodes ill for the human race if the opinions of Freud and his disciples are correct. According to them, while all human beings are born iniquitous some are much more iniquitous than others as even in infancy they are full of erotic desires; and as they get older there is an incessant conflict between the moral sense which somehow has been developed and their inborn excessive concupiscence, which eventually leads to the nervous breakdown known as neuroasthenia. The author of this book takes a much broader view, striving to give due weight to all the different schools of psychopathologists. After all, whatever the causes and symptoms of neuroasthenia may be—all are well described in this book—the main object of the physician is to make the patient well. Almost one-half of the work is therefore devoted to treatment, including psycho-therapy. This will be found most valuable by all who are called upon to treat these very difficult cases.


There are many differences of opinion among those who are patiently investigating the disorders of the mind not distinctly traceable to demonstrable organic lesions, and the differences may be due in no small degree to the lack of precise definition of the terms used. The author of this work is careful in this respect. He states that, strictly speaking, neuroses are not diseases in the medical sense at all but only in the social sense; they are the result of a conflict between the individual and society, whereas other diseases are the result of a conflict between man and nature.
Further, in classifying the neuroses a distinction is made between those in which the etiological factors are predominantly physical, and those in which they are predominantly mental, the latter being called psychoneuroses. There are three simple or "actual" neuroses: neurasthenia, anxiety neuroses, and hypochondria. There are four psychoneuroses: conversion-hysteria, fixation hysteria, and the obsessional neuroses. The discussion of these disorders with advice as to their appropriate treatment form the main part of the book. It may be added that the author is a thorough Freudian. There are also chapters on the traumatic neuroses, including war shock; on prophylaxis of the neuroses, and on the mental treatment of conditions allied to them.

Dealing with a very difficult subject the author writes clearly and the methods of treatment advised are such as seem sound to the general practitioner. Concerning many of these cases he is not very optimistic. In the chapter on obsessions little is said concerning divided personality, such as we see exhibited in demoniacal possession and similar disorders, which are still not uncommon in countries where there is much ignorance and superstition; but the reason for the partial omission may be that the book deals mainly with treatment. Missionary physicians, extremely busy as they are, ought to be fairly familiar with books such as this as the information given may lead to the unravelling of many peculiar and puzzling mental disorders.


After moving warily between the quagmires and quicksands of the territory marked out as their own by the psycho-pathologists it is a relief to reach the firm ground of mental diseases unmistakably due to physical causes.

As the author observes, the term "mental deficiency," in its literal meaning, is just as applicable to a decay as to non-development of the mental powers, to the dotage of old age or disease as to idiocy from birth; but this work is confined to the consideration of amentia, the state of never having attained normal mental development. As no ordinary human being is always of perfectly sound mind, the question at once arises, what is normal mental development? The author suggests as the normal standard the presence of a mental faculty which enables the individual so to manage his affairs and regulate his conduct as to be able to maintain existence without external provision or support. Then follows a description of all the different grades and varieties of mental deficiency, their diagnosis and prognosis, treatment and training. The whole subject is dealt with thoroughly and scientifically and yet the book is very readable.

Later, there are chapters dealing with the subject from the sociological point of view, which are not the least important. Many of us, while in hearty sympathy with all those engaged in the work of social reform, cannot but deplore, some of their public utterances and their confusion of cause with effect. A man drinks to excess and eventually is sent to a mental hospital; it is generally taken for granted that the insanity was caused by drinking. So with the prostitute; her conduct is assumed to be the deliberate and intelligent choice of a wicked life. Before embarking on social crusades, it would be well if reformers would read with an open mind such facts and judgments as are here presented by the author concerning the connection between feeble-mindedness and pauperism, vagrancy, inebriety, immorality, illegitimacy, venereal disease, crime, and the danger to the state of permitting the feeble-minded to propagate their kind.

This is a question well worth the consideration of medical missionaries in China, where there are only one or two hospitals for the unmistakably insane, and little or no provision for the care of the feeble-minded. In England, on July 1st, 1906, the total number of cases of amentia was 138,529, equivalent to 4.03 per 1,000 of the whole population. Granted that the population of China is 400,000,000 and that the aments are at least quite as numerous proportionately as in England, it means that in China there are over 1,600,000 cases of feeble-mindedness from birth and these patients are often allowed to be at large. This should be borne in mind in considering the social evils of the country.

The book under review is very well written, records of illustrative cases are numerous, and the illustrations are good. Perhaps the best recommendation of the book is comprised in the words of the author: "The condition of amentia,
whilst presenting many interesting problems to the physician, the pathologist, and the psychologist, has also a much wider interest and importance. Since in Man the predominant feature is Mind, and since it is by the development of this faculty that human progress has taken, and must take, place, it is clear that the question of its disease, and particularly of its defect, is one of supreme importance to the statesman, the sociologist, and the philosopher."


Written by a well-known American specialist in gynecology and obstetrics who has been teaching these subjects for the last twenty years in the Medical School of the University of Pennsylvania, it needs one who has still greater experiences to criticize the book authoritatively. All we can say is that as a handy manual for students it is very clear, precise, and well illustrated, and that the busy practitioner who has none too much time for professional reading will find it useful for bringing his knowledge and practice into harmony with the latest advances in the science and art of obstetrics.


The stress and strain of modern life, which means the wear and tear on the human organism, are telling in every direction. There can be no doubt, says the author, that arterial disease in the comparatively young is more frequent than it was twenty years ago, and that the mortality from diseases directly dependent on arteriosclerotic changes is increasing. In this edition arteriosclerosis is not regarded as a disease with a definite etiologic factor, but as a degenerative process affecting the arteries following a variety of causes more or less ill-defined. It is not considered a true disease, though possibly syphilitic arteritis may be viewed as an entity. The chapter on blood pressure has been much expanded and some original observations have been included. There are new chapters on cardiac irregularities associated with arteriosclerosis, and on blood pressure in its clinical applications. The book is well written and the illustrations are numerous. It is a valuable monograph on a most important subject.


Almost every medical missionary in China in these days, by virtue of his position as an exponent of the medical science of the West, is called upon to fight against the ignorance and superstition which spread disease and to teach the people of the city in which he lives the elementary principles of health and sanitation. And this he must do, not by hard and fast rules which may clash excessively with native customs and beliefs and thus render progress slow, but in a way which will lead the people firmly but willingly onward. The "sermons" of Dr. Balfour should be a great help to sanitary reformers of this accommodating disposition. The social and religious life of the Egyptians, among whom he has labored, may be very different from that of the Chinese; but the difficulties of tropical medicine are fundamentally very much the same everywhere, as well as the means of overcoming them.

The essays are written in a very interesting style and are interspersed with anecdotes and illustrations based on personal experiences.

The first deals with tropical sanitation from the point of view of the sanitary inspector. His friends and enemies are enumerated, and methods of utilising the one and combating the other are discussed. Mosquitoes, epidemic diseases, sewage, control of milk supply, and other matters of great importance receive attention.

The second essay is on the tropical problems in the New World. It summarises the author's experiences in the West Indies and Tropical America, includ-
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ing Barbados, Grenada, Trinidad, Venezuela, Curacao, Maracaibo, Colombia, Panama, Jamaica, and Cuba. Prevalent diseases, their causes and their hygienic antidotes are indicated, and interesting problems are discussed.

The subject of the third is preventive inoculation against typhoid fever and cholera. The author compares the results achieved by inoculation during the recent war with the losses sustained in the Boer campaign. Methods for protecting the human organism against typhoid and cholera are graphically and lucidly explained in a popular manner.

The next is on the medical entomology of Salonica. It deals with the wingless pests of Salonica, many of them common in other parts of the world, summarises their habits and the diseases they carry or cause, and provides, by its accurate and plentiful illustrations, adequate means of recognising the pests described.

The fifth essay gives a short but comprehensive account of the sanitary methods which were adopted in the Eastern war areas as seen by the author in the capacity of a member of the Medical Advisory Committee which visited Egypt, Mudros, Gallipoli, Macedonia, Malta and Mesopotamia, and during his further visits to East and South Africa and Palestine. The suitability of the method to the country is dealt with, and different systems compared in the light of wide experience. The subjects dealt with include Sewage Collection and Disposal, Food and Cooking, Water Supplies and Water Purification, Bathing and Washing, Disinfection, Fly Destruction, Buildings, etc.

The last essay is on the Palm tree from a sanitary standpoint. The numerous hygienic relations of the palm to man in various parts of the world are here discussed in a manner which is both profitable and informative from a sanitary and economic standpoint.

The work is lavishly illustrated with 180 illustrations in color, half-line and line. It will be most useful to all who are engaged in meeting the problems of sanitation and health in hot climates.


The Conference of Nurses was attended by over fifty foreign nurses from different parts of China, out of a total membership of 183. Naturally, the subjects considered were mostly connected with the training of Chinese pupils. There are 52 training schools subject to the rules and standards of the Association. Every physician in China should really make himself acquainted with its aims and practical work by obtaining a copy of this report. After reading the various papers, particularly Miss Nina D. Gage's on "Some New Methods in Teaching Nurses," it will be generally recognized that the standard is very high and that inferior teaching should no longer be tolerated. The report contains the Examination Questions for 1918-1919. A most commendable feature of nearly all the papers is their strong evangelistic tone.


All hospitals in China with foreign-trained nurses should certainly subscribe for one or more copies of this journal, so that the nurses may be encouraged to advance in the knowledge of their work and to feel that they belong to a very honorable profession, national and also world-wide. The present issue maintains the high standard set by the first number.


Intended for the instruction of nurses, this is a readable account of the principal diseases caused by microbes, interspersed with directions for microscopic
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examination, the prevention of infection, etc. As the pamphlet also includes such diseases as relapsing fever, syphilis, malaria, amoebic dysentery, ascariasis, uncinariasis and kala-azar, perhaps in the next edition it would be well if the title were made a little more comprehensive. The hope is expressed by the authoress that the book will be helpful to some busy missionary who is attempting to teach without adequate time or text books. We respectfully suggest that she should be a little more ambitious and write for nursing schools of a higher order. The kind of teaching she refers to is hardly fair to the pupils and the time for it has passed by. As a basis for fuller instruction the little book will be found suggestive by those engaged in teaching Chinese nurses.


This Directory, which has now secured a well-established position, opens with an admirable review of the year 1919, from the point of view of the educationist. Then follow well-informed articles on the Government of China; Shantung Christian University; Government Teachers’ College; Ming Lih Middle School; Educational Societies and Other Organizations; Music at the McTyeire School; The Chinese Phonetic Alphabet and its teaching; Students in Arms—an analysis of the political conditions which induced Chinese students to enter the political arena; British and French University Degrees; Examinations held in Great Britain preliminary to the Professions; Hongkong Local Examinations; Statistics of Schools and Pupils; Works of Reference.

It also contains a Directory of over 3,000 teachers, and a detailed list of the universities, colleges, and schools in China. The work is indispensable to all who are interested in the education of the Chinese.

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.

Ammonium Rhodanatum.

To the Editor, C. M. J.

Dear Sir,—Will you kindly tell me what " Ammonium Rhodanatum Pur Crist." might be? Is it Sulfocyanide of Ammonium? Kindly tell me what are the uses medicinal and otherwise of this salt.

Thanking you, etc.,

Yours sincerely,

Wallace Crawford.

Tzeliutings, June 22, 1920.

After examining several recent works on Materia Medica and Pharmacology without finding any reference to ammonium rhodanatum, and being assured by a busy dispensing chemist in Shanghai, that he had never heard of the drug and certainly had never dispensed it, we began to think that perhaps it was a mythical substance. However, by dint of further inquiry the following brief description in "Martindale and Westcott," was discovered.


Prof. Bernard E. Read, of Peking Union Medical College, kindly sends this note. "The substance referred to by Dr. Crawford is undoubtedly Sulfocyanide of Ammonium. The sulfocyanides (syn. sulfocyanates) are called rhodanides or rhodanates on account of the rose color obtainable with iron salts. (See Richter's Organic Chemistry for name and test.)" "With regard to uses medicinal and otherwise. The sulfocyanides are not used in medicine: the chief use of this salt is in the quantitative estimation of silver by Volhard's Method."—Ed.
What is "Amibiasine"?

To the Editor, C. M. J.,

DEAR SIR:- May I ask what the preparation "Amibiasine" might be? Has it been tried out by any of the readers of the Journal?

Thanking you, etc.,
WALLACE CRAWFORD.

Amibiasine (Comp. Ext. Garcinia) is a proprietary preparation sold by the Anglo-French Drug Company, London and New York. It is said to be of value in amoebic dysentery, diarrhoea, enteritis, etc. Whether any of our readers have used it we must leave it to them to answer.—Ed.

A Danger in Catheterization.

To the Editor C. M. J.

DEAR SIR:- A Chinese boy, aged one year, was brought to the hospital by his mother stating that he had not voided urine for over twenty hours; the bladder was distended. The patient’s bowels had moved just before coming to the hospital. The child was catheterized and four ounces of urine removed. In attempting to remove the catheter it was found to be firmly held, and chloroform was given to relax the vesical sphincter. Nevertheless, the catheter could not be withdrawn. That night a sausage-like mass was felt near the caecal region. Later, tenesmus of the bowels developed, and the signs of a step-ladder swelling of the colon, evidently due to obstruction, were plainly visible. A diagnosis of intussusception was made and the parents were asked for permission to operate. This was refused, but permission was given to remove the catheter, which was done under local anaesthesia. The eye of the catheter was outside of the bladder sphincter, the catheter being held by a tonic spasm of the compressor urethrae, probably associated with the tenesmus due to the intussusception. At no time did the child show any inclination to vomit.

The case illustrates the necessity of care in reviewing all the causes of suppression or retention of urine.

Yours truly,
S. H. MARTIN.
Lungchingsun, July 1920.

Mission Scholarships.

The following letter sent to the Editor of "Medical Missions in India," deals with a question of interest to those in charge of medical schools in China, human nature being very much the same throughout the Orient. Perhaps some of our readers will give their opinions on the subject.

To the Editor, M. M. I.

DEAR SIR:— I should like to know the opinion of your readers about a matter which has recently been brought to my notice, viz., the methods, if any, necessary and suitable to use, for ensuring that students holding mission scholarships shall fulfil their engagements. There would appear to be two possible ways of dealing with this question:—first, the ordinary commercial one of a stamped legal agreement by which the students, or their guardians, undertake to refund the amount spent upon them in the case of their failing to fulfil their engagement. This, if necessary, could be produced in a court of law, and payment be thus secured. The other way of facing the question is to trust entirely to the honour of the students, a written paper, of no legal value, being signed by them simply to ensure that they fully understand to what they are pledging themselves, and that there may be no doubt, later on, as to what was agreed upon. If we proceed to consider the respective advantages (or otherwise) of these two methods, it is perfectly clear that there is an obvious objection to the legal solution of the difficulty, in that no Principal of a Christian college would care to publish abroad, in a court of law, the moral failure of his students. It is probably because of this objection that I found, to my horror, that it was the custom of one College to try to secure its end in another way. The students start their course with some kind of a printed agreement (but not a proper legal form) and this agreement having no legal force, an effort is made to strengthen the position, after the students are asked for permission to operate. This was refused, but permission was given to remove the catheter, which was done under local anaesthesia. The eye of the catheter was outside of the bladder sphincter, the catheter being held by a tonic spasm of the compressor urethrae, probably associated with the tenesmus due to the intussusception. At no time did the child show any inclination to vomit.

The case illustrates the necessity of care in reviewing all the causes of suppression or retention of urine.

Yours truly,
S. H. MARTIN.
Lungchingsun, July 1920.
their certificates being retained, but this is obviously something of a euphemism. Desiring the goodwill of their College Principal, and feeling, rightly or wrongly, that their future depends a good deal upon his recommendation, they are not likely to protest against what is the custom of the College. In any case the method is at bottom one of mild intimidation. The certificate has no monetary value to anyone but its rightful owner and can only be retained with the idea of preventing the owner from taking any post except such as the Principal agrees to. A legal agreement is at any rate preferable to such a device. But I would strongly urge the adoption of the second method, namely, that of trusting entirely to the student's sense of honour and right. Coercion of any kind as an incentive to Christian work must be an anomaly; loss of the money is of far less importance than the character of the student, and to assume that the sense of honour and desire for mission work is too weak to be depended upon and must be buttressed by penalties for failure, is surely to destroy, rather than foster, the very spirit we desire in them. Here again, it is only by expecting great things that we shall attain to them.

I am
Yours sincerely,

E. L. Young.

NEWS AND COMMENT.

MARRIAGE.

Edwards—Huntley. — At Oberlin, Ohio, U. S. A., on June 19, 1920, Evangeline, daughter of Dr. and Mrs. George A. Huntley of Shanghai, to Mr. Davis Edwards of Oberlin.

DEATHS.

Dale: At Singapore on April 22, 1920, Robert John Chalmers, the dearly beloved infant son of Dr. and Mrs. W. Chalmers Dale, aged 4½ months.

A cablegram recently announced the death from pneumonia of Dr. O. L. Kilborn, of Tze liu tsing, Szechwan. Dr. Kilborn was corresponding secretary and treasurer of the Canadian Methodist Mission, Szechwan, and death occurred while he was on furlough in Toronto. He was one of the original members of the mission to West China.

Death of Dr. Menzies. — Out of nine men apprehended in connexion with the murder of Dr. J. R. Menzies, three have been proved to have taken part in the attack on the mission premises. One of the prisoners has been sentenced to imprisonment for life. He confessed to having shot Dr. Menzies, but as the Doctor had received two bullet wounds, only one of which was fatal, and the prisoner only confesses to having fired one shot it is impossible to prove that he fired the fatal shot. The other two, who were found guilty of having acted as sentinels when the attack was made, have been sentenced to imprisonment for 12 years. The question of indemnity has not yet been raised by either side.

Death of Shen Ten-ho. On July 5, 1920, Shen Ten-ho, formerly President of the Chinese Red Cross Society, passed away after an illness of three weeks. According to some of his friends he was a great soldier, statesman, reformer, and philanthropist.

President Hsu Shih-chang was deeply affected when he received the news of the death of Dr. G. Morrison, late political adviser to the Chinese government. The President will bestow a posthumous honor upon Dr. Morrison.

Dr. H. T. Whitney, formerly President of the C. M. M. A., went to the United States to have cataracts removed from his eyes. This was done with perfect success. He is especially enthusiastic over the "Smith" operation which consists in removing both capsule and lens at the same time. In a recent letter to a friend he says: "You cannot imagine the great joy of being able to see again. It was an entirely new world to me, after having it shut out for two years."

Professor Frank G. Haughwout, who for the past five years has been Professor of Protozoology and Chief of the Department of Parasitology of the College of Medicine and Surgery, and in the Grad-
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Dr. R. W. S. Cruickshank, a graduate of medicine of Aberdeen, has been appointed Associate Professor of Physiology in the Union Medical College, Peking. Professor Cruickshank saw a great deal of active service during the war as a medical officer. He is at present lecturer in physiology in the Washington Medical College, St. Louis, and will take up his new duties in Peking in September.

Leper Hospital in Seoul. It is planned to establish a leper ward in connection with the hospital of Severance Medical College at Seoul, Korea. The head of the police bureau has sanctioned the plan proposed by the Presbyterian Board, which originated under Dr. O. R. Davison, dean of the college.

Intimation has been sent out by the Hongkong Colonial Secretary's Office that Formosa is declared by Hongkong to be infected with cholera, and that precautions should be taken on arrival from all parts of that island. Cholera has also been recently prevalent in various parts of China and Japan.

The China Medical Board, Peking, has agreed to finance a deputation to the home lands in the interest of the Canton Hospital. Dr. J. Oscar Thomson and Dr. John Kirk are to take up the work, and have already left for the United States.

The London Missionary Society observed February 8th to 15th, 1920, as its Medical Week and the February number of the Chronicle is specially a medical missionary number. A strong appeal is made both for more missionaries and more money. The Society has only 30 doctors and 14 nurses for its 51 hospitals and dispensaries. Figures are given showing the progress which has been made in medical work in the last ten years. Native assistants have increased from 43 to 219, and in-patients from 9,128 to 18,124, but the most striking increase has been in the amount received in fees, from £1,985 to £12,664.

The Red Cross Crusade Against Epidemics.—At the first meeting of the General Council of the League of Red Cross Societies, held in Geneva, March 2-9, twenty-eight national societies were represented. It might be of interest to note that the same nations participated in the first council of the League of Nations. The general council decided to place at the top of the list of adopted resolutions the text of Article 25 of the constitution of the League of Nations, stipulating that the members of the League of Nations agree to encourage and further the establishment and cooperation of duly authorized voluntary national societies of the Red Cross. In the course of the session there was read an appeal from the League of Nations asking the Red Cross to combat the ravages caused by epidemics in central and eastern Europe. The council adopted a resolution expressing its full accord and complete sympathy with the suggestions, but pointing out that nothing could be done unless the necessary food, clothing, and means of transportation were forthcoming. These the governments ought to provide; the League of Red Cross Societies on its part would seek the immediate extension of voluntary aid to the afflicted regions. The resolution closed with these words: "This is the first time that, as the result of the collaboration of two great organizations, the League of Nations and the League of Red Cross Societies, there is born a more certain and adequate hope of the solution of the tragic problems that bring distress to the world."

Chinese Red Cross.—The Chinese Red Cross is to-day an organization with 25,000 members, whose interest in world...
relief work is evidenced by the entrance of the society into the League of Red Cross Societies. The Chinese have been much impressed with the work of the American Red Cross both during and after the war, and China now desires to take her place beside the other nations of the world in the work of relieving human suffering. — *Am. Jour. Pub. Health.*

On June 15, 1920, the Chinese Red Cross held an inauguration ceremony in commemoration of the opening of the Summer Diseases Hospital at No. 316 Tientsin Road, Shanghai. The Chinese officials present were Admiral Tsai Tin Kan, President of the Chinese Red Cross; Hon. Yang Tcheng, Commissioner of Foreign Affairs, and Y. C. Tong, Chairman of the Shanghai branch of the organization.

**NEW HOSPITAL IN SHANGHAI FOR INFECTIOUS DISEASES.**—Early in July the Chinese Infectious Diseases Hospital (formerly the Chinese Cholera Hospital) was formally opened. It is situated on property adjoining the boundary of the French Concession. A trained staff is in attendance under the charge of Dr. Stafford M. Cox. There are two experienced lady nurses as well as 12 male nurses. After inspecting the place thoroughly, Dr. Arthur Stanley, the Municipal Health Officer, expressed a very favourable opinion on the various arrangements that had been made.

**NEW HOSPITAL AT NEWCHWANG.**—On July 10, the new quarantine hospital at Newchwang was formally opened, many Chinese and foreign officials being present at the ceremony.

**A RECENT TRAGEDY.**—The following incident is recorded as an example of the subtle inductive reasoning of the disciples of Sherlock Holmes in Shanghai; and partly to show the necessity of surgeons in China being extremely careful not to give amputated limbs or other parts of the human body which have been removed to relatives of the patients or others, unless a guarantee is given that the parts will be so disposed of as to prevent the circulation of harmful rumors. Perhaps it would be well if such transactions were carried through with the knowledge and approval of the Chinese police.

“A human arm, at first believed by the police to be that of a European woman, was found at the water's edge of the Shanghai Public Gardens at noon yesterday. It was a right arm, apparently severed from the body about two inches below the shoulder. It did not appear to be the work of a surgeon, for the bone was jagged, and attached were the lower shoulder muscles.

“The arm evidently was that of a finely-formed Chinese young woman of small build, and of one accustomed to the good things of life, for the nails were beautifully manicured; the hand in fact bore every evidence that the one who owned it was a woman of refinement. There were no rings on the fingers, but there were marks showing that the owners had long worn rings; the fingers, however, were not lacerated as they would have been had the rings been torn off. The probabilities seem to point to the committal of a particularly hideous crime.”—*Shanghai Newspaper Report,* June 30, 1920.

“Yesterday morning it was definitely ascertained, when one of the doctors of a Shanghai hospital visited the mortuary, that the arm was that of a Chinese youth which had been amputated at the hospital a few days ago. Relatives asked for the limb, which they threw into the river to satisfy their superstitious fears. "The young man was employed in a mill, his work requiring that his hands be almost constantly in tepid water; hence the ‘manicured’ nails. His arm had been caught in machinery and was broken in two places. He died from physical shock following the accident and operation." *Shanghai Newspaper Report,* July 1, 1920.

**“OVER THERE” AS A FUNERAL MARCH IN CHINA.**—After proving to be the most popular of all American war time “tunes,” “Over There” has found new popularity in Shanghai. On Wednesday afternoon of this week, the strains of the “yank” song brought many occupants of business houses on Avenue Edward VII to their windows to find that the event was a funeral, and that the band rendering the “fighting song” was followed with all due solemnity by the chief mourner in sack cloth and the receptacle for the person who was bound “over there.”—*Millard’s Review.*

**ANTI-CIGARETTE CAMPAIGN.**—The Canton students are organizing an anti-cigarette campaign. They will work in their schools and homes first before undertaking any campaign outside against smoking.
Tuberculosis in Japan. — Tuberculosis sufferers are on the increase in Japan, the latest returns indicating the total number at above 1,000,000.

Great Mortality in Hankow and Wuchang. — In the Wu-han cities (Hankow, Hanyang, and Wuchang), disease has broken out among the soldiers and they are reported to be dying by hundreds. At first it was thought that the cause of all these fatalities was cholera, but the disease has been diagnosed as a particularly malignant form of malaria, which nevertheless appears to be about as fatal in its effects as the more notorious disease of cholera. The epidemic has spread to the civil populace and people are dying on the streets of Hankow and Wuchang. — N.-C. Daily News, July, 1920.

NOTICES.

Union Medical College for Women, Peking. — The Union Medical College for Women, Peking, will matriculate a new class September 15th, 1920. Candidates, in addition to an accredited four year middle school course, must have successfully completed two years in a recognized arts college. For further particulars, application may be made to the Dean, Dr. Eliza E. Leonard, Presbyterian Mission, Peking.

A Bargain in Sterilizers. — Owing to a duplication of order we have on hand an extra set of the following: —

One dressing sterilizer, 20 inches in diameter.
One instrument sterilizer, with self-lifting tray, 16"x9"x6" inside.
Two 5 gallon water sterilizers.

These are made by Bramhall Deane & Co. of New York, heavily nickel plated, are fitted with Khota! stoves for each part (burning kerosene), sterilize under pressure, and are less likely to be damaged or get out of order under hard usage than any other make we know. They are absolutely unused, but owing to the circumstances we are offering them for considerably less than cost.

Please address inquiries to The Christian Hospital, Shaoehing, Chekiang.


MANUSCRIPTS. — It is desired that manuscripts should be typewritten, with wide margins, and double spaced, on one side of paper 8½ by 11 inches in size. Number the leaves consecutively, beginning with the title page. Put name and address on the manuscript. When romanised Chinese terms or phrases are used the Chinese characters should also be given. To ensure appearance in a particular number of the Journal, MS. should reach the editor at least six weeks before date of publication. Medical contributions are solicited from all physicians and surgeons in the Far East.

ILLUSTRATIONS. — Illustrations should be clear. Of photographs send a good print rather than a negative. Write title or short explanation on back of each picture or table. See that the text references and "figures" correspond.

BIBLIOGRAPHIC REFERENCES. — References to authors in the text should be made in the following way: — "According to Smith1 (1900) the spleen is enlarged, but Robinson2 (1914) says the reverse." Authors quoted should be numbered in the order of citation and the bibliographic reference should be given the same number. Arrange references in a list at the end of the article in the order of the numbers.

REPRINTS. — Contributors of original articles are supplied with sixteen reprints, free of charge. Additional reprints may be obtained on written request which should be attached to the MS. sent in. The price of additional reprints is as follows: —

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First Photograph of the Anatomical and Anthropological Association of China taken at the Entrance to the Anatomical Laboratory of the Peking Union Medical College on February 27th, 1920.
REPORT OF THE PROCEEDINGS
OF THE
Anatomical and Anthropological
Association of China.
AT
Conference of Medical Associations
Peking, February, 1920

Printed by:
The Shanghai Times
1920.
ANATOMICAL AND ANTHROPOLOGICAL ASSOCIATION OF CHINA.

The "Anatomical and Anthropological Association of China" was formed at a meeting held on Thursday afternoon, February 26th, 1920, in the Anatomical Laboratory of the Peking Union Medical College.

LIST OF MEMBERS

Honorary Member:

Active Members:
Anderssen, J. G., Peking (Councillor).
Black, Davidson, Department of Anatomy, Peking Union Medical College (Councillor).
Boring Alice M., Department of Biology, Peking Union Medical College.
Britland, A. J. D., Peking Union Medical College Hospital.
Brubacker, A. G., Lia Chow, Shansi.
Chen, S. P., Tsung Pu Hutung, Peking (Councillor).
Chow, Wm. L., Ministry of Agriculture and Commerce, Peking (Councillor).
Cowdry, E. V., Department of Anatomy, Peking Union Medical College (President).
Cowdry, N. H., Department of Anatomy, Peking Union Medical College.
Chuan, S. H., Director, Army Medical College, Peking (Councillor).
Danton, C. H., Tsing Hua College, Peking.
Dittmer, E. G., Tsing Hua College, Peking.
Earle, H. T., Dean of the Medical Faculty, Victoria University, Hongkong (Councillor).
Faust, E. C., Department of Pathology, Peking Union Medical College.
Gray, Douglas, Physician to the British Legation, Peking.
Harding, B. M. I-chow-fu.
Hodges, P. C., Peking Union Medical College Hospital.
Howard, H. J., Department of Ophthalmology, Peking Union Medical College.

Hsieh, E. T., Department of Anatomy, Peking Union Medical College (Councillor).
Ingle, L. M., Department of Anatomy, Shantung Christian University, Tsinanfu, Shantung.
Ingram, J. H., American Board Mission, Peking.
Inouye, M., Department of Anatomy, Tokyo Imperial University, Tokyo, Japan.
Li Ding, Department of Anatomy, Hangchow Provincial Medical School, Hangchow.
Li Pau Chen, Department of Anatomy, North China Union Medical School for Women, Peking.
Lieu, T. C., Hunan-Yale Medical School, Changsha, Hunan.
Main, G. Duncan, Hangchow.
Maxwell, J. P., Peking Union Medical College.
Medhurst, C. Spurgeon, Peking.
Merrins, E. M., St. John’s University, Shanghai (Councillor).
Neal, J. B., Shantung Christian University, Tsinan, Shantung.
Ono, Shun Ichi, Koishikawa, Kobinatadi II, No. 35, Tokyo.
Packard, Charles, Department of Biology, Peking Union Medical College (Secretary-Treasurer).
Phillips, E. Margaret, 13 Nan-wan-tzu Hutung, Peking.
Porter, L. C., Peking University, Peking.
Porterfield, W. W., St. John’s University, Shanghai.
Ridge, W. S., Peking.
Read, Bernard E., Department of Physiological Chemistry, Peking Union Medical College.
Rosenius, Elsa, Peking.
Schumaker, Arthur, Tsung Pu Hutung, Peking.
Shields, R. T., Department of Histology and Embryology, Shantung Christian University, Tsinanfu, Shantung (Councillor).
Stevenson, P. H., Lu-chow-fu, Anhui.
Stone, R. S., Department of Anatomy, Peking Union Medical College.
Tang, E. H., Director, National Medical College, Peking (Councillor).
Taylor, H. B., Anking.
Ting, V. K., Director, Geological Survey, Peking (Councillor).
Van Buskirk, J. D., Severance Union Medical College, Seoul, Korea.
Wilder, G. W., Peking.
Williams, J. D., Department of Anatomy, Hunan-Yale Medical School, Changsha.
Wu Lien Teh, Peking.
Constitution of Association.

CONSTITUTION

1.—The Association shall be called the Anatomical and Anthropological Association of China.

2.—The object of the Association shall be to advance the sciences of Anatomy and Anthropology in the Far East, in the broadest sense, especially in the co-ordination and centralization of activities, in the improvement of conditions for teaching and research and in the financing of special investigations and expeditions.

3.—All persons who are interested in the objects of the Association shall be eligible for membership.

4.—The names of candidates for membership shall be submitted to the Secretary-Treasurer at least one month before the meeting at which they come up for election.

5.—Each member shall pay an initiation fee of $2.00 to the Secretary-Treasurer.

6.—Annual dues shall be determined at the first annual meeting.

7.—Members duly elected shall be able to assume life membership by the payment of $50.00, it being understood that the Association does not assume any obligations with respect to publications.

8.—Upon the recommendation of the Council, persons who further the interests of the Association either financially or in other ways shall be elected patrons of the Association.

9.—The officers of the Association shall consist of a President, elected annually; and a Secretary-Treasurer and twelve Councillors, elected to serve for a period of two years.

10.—The Council shall meet at the call of the President, in the interval between annual meetings for the consideration of expenditures, of recommendations for membership, and for the arrangement of programmes for meetings. The Council shall also deal with all other matters of concern to the Association and make recommendations to it for decision.

11.—Annual Meetings of the Association shall be held in close affiliation with the China Medical Missionary Association.

12.—Special meetings shall be held at the discretion of the President and at least three members of the Council.

13.—For the election of members, changes in constitution, extraordinary expenditures, and dropping of members, a three-fourths vote of those present will be required; for all matters of minor import, a simple majority vote will be sufficient.
C. M. M. A., MEDICAL CONFERENCE
PEKING, FEBRUARY, 1920.

SECTION ON ANATOMY AND ANTHROPOLOGY

During the Joint Conference of the China Medical Missionary Association and the National Medical Association of China which was held in Peking, February, 1920, the following papers were read before the Section on Anatomy and Anthropology.


Dr. Hrdlicka first gave a short résumé of the history of anthropology showing the recent origin of the science and its rapid rise in importance in the latter part of the 19th century. He noted that the most famous leaders in anthropology were medical men eminent in their profession and defined the science concisely as anatomy, physiology, histology and pathology applied. All the great centres of learning are especially famous on account of their valuable collections to which students from far and wide are attracted, and for this reason Dr. Hrdlicka emphasized the desirability of establishing an organized system for the collection of material in China on a large scale and for placing it in a form available for study.

Discussed by Davidson Black and P. C. Hodges.

The paper in full will be published in The American Journal of Physical Anthropology.

2.—The Attitude of the Chinese Government Towards Dissection. S. P. CHEN, Official Representative of the Board of Interior.

To the Members of the Association:

I have been directed by the Ministry of the Interior to attend this meeting, in response to a request of your Association, in order to take up the question of dissection with you.

I understand from some of your members who have had to do with the teaching of anatomy that considerable difficulty is experienced in obtaining a sufficient number of bodies for the purposes of dissection.

The question before us is this: "Who or what is responsible for this state of affairs and is there a remedy for it?"

A remedy must sooner or later be found if medical education is to make any progress in this country.
I see from your programme that I am down to define the attitude of the Government towards dissection. I must confess this is no easy matter; but, although we are not in a position to make any definite statements which can be supported by documentary evidence, it is possible, from what official documents there are and from the verbal replies given by responsible officials to inquiries on the subject, to see more or less clearly how official opinion is shaping in regard to it.

In April, 1914, His Excellency Mr. Chu Ch'i Chien, the then Minister of the Interior, passed some by-laws dealing with the subject of post-mortem examinations and dissection, and caused some "Detailed Regulations" to be drawn up and promulgated.* Although these by-laws and detailed regulations did not differentiate clearly between ordinary post-mortem examinations and dissection, there were some clauses under which it would be possible to practise dissection without offending against the law.

Reading through these regulations it would appear that the Government at that time appreciated the necessity of dissection in the education of medical students but desired to be on guard, as it were, against something—that something being apparently popular feeling.

I will not take up your time by enumerating these regulations in detail for I feel sure that those of you who are present and are interested in the subject of dissection must be acquainted with them. What appears to be the main point in them is that the Government authorities have no objection to the practice of dissection provided certain conditions are fulfilled—conditions over which the Government has no control.

What are these conditions? The main one is, that the consent of relatives must first be obtained.

Those of us who have been a little time in this country know all too well what this means: the chances of obtaining the consent of relatives in a matter of this kind are so small that we may regard them as nil. So it amounts to this: under the above-mentioned regulations, the only bodies that might be available for dissection are those of persons who have been executed for crime or have died in prison, and have no relatives whatsoever to claim them. I have made certain inquiries on this subject and have been informed that it is not often that relatives do not come forward to claim such bodies for burial. The real obstacle to much progress in the direction of procuring bodies for the purposes of dissection lies in the view which the Chinese people of the present day take of such things. That there is this terrible dread of ordinary post-mortem examination—to say nothing of

*Ch. Med. Journ., 1914, p. 237. See also the volume for 1916, p. 126.
dissection—among the people in general can easily be ascertained by anyone who may choose to probe even very superficially into the matter. I can recall an instance in which no end of trouble was caused by a very, very insignificant post-mortem incision performed without the consent of the relatives of the deceased. What I have said shows you what the responsible Government officials thought of the subject more than five years ago. To-day there are indications that the authorities fully appreciate the fact that dissection is essential to the progress of medical education in this country, and are, in spite of popular feeling, doing their utmost to facilitate the procuring of dead bodies for this purpose, as evidenced by the steps recently taken by the police authorities. I have been given to understand that in future less difficulty will be experienced in the obtaining of sufficient bodies to meet the needs of the medical schools in Peking.

There are, I am told, quite a number of homeless and destitute in the city who have not only no relations of any kind but also no means of self-support and have therefore to be taken care of by the authorities. Refuges have been established for these poor individuals, and the sick among them are housed in one of these. It is possible then that these sick may be the source of subjects for dissection later.

Of course my remarks apply only to Peking, and not to other educational centres in China. Those in authority in the capital are favourably inclined towards the practice of dissection; but, as you all know, it does not follow that the provincial authorities will take one and the same view. Changes come slowly in this country, but come, they will. The official attitude in Peking towards the needs of modern medical education has been very encouraging, so there is no reason why the same change for the better will not take place in those provinces in which modern medical schools have been established.

In conclusion, I might add that if you, or a sub-committee elected by you to deal with the matter, have any suggestions to bring forward for presentation to the Ministry of the Interior, I should be more than pleased to tender my services.


3.—The Jewish Colony at Kaifengfu. Dr. C. D. TENNEY, American Legation, Peking.

After mentioning the fact that no trace of the old synagogue remains, Dr. Tenney proceeded with a description of two ancient tablets, written in the 2nd year of Hung Chih (A.D. 1489) and the 7th
year of Cheng Te (A.D. 1513), respectively, in translating which he brought out some interesting points with regard to the colony. He then reviewed the observations of early travellers in China with regard to the presence of foreigners, particularly Jews. In concluding, he remarked that two great lessons were to be learned from the history of this Jewish colony: first, that the Jew as a trader has met his match in China, and instead of enriching himself at the expense of his Chinese neighbours has been sucked dry in the competition of trade; and second, the extraordinary assimilative force of Chinese society. In the following discussion it was mentioned that traces of Jewish blood may still be traced in Kaifengfu in the physiognomy of a small portion of the inhabitants.

Discussed by Shun Ichi Ono, J. P. Maxwell and Davidson Black.

4.—Stone Implements of Neolithic Type in China. J. G. Anderssen, Peking.

After referring to the fact that the Geological Survey of China has taken up this line of work and has gathered much fresh material from the Northern and Central provinces, Dr. Anderssen brought forward interesting points of similarity between the neolithic stone implements found in China and North America. He then referred to his recent discovery in Anhui of iron implements used by farmers which bear a remarkable resemblance to the neolithic semilunar knives from which they are probably derived.

(Discussed by P. C. Hodges, E. I. C. Werner, P. H. Stevenson and W. W. Stifler.

The complete paper appears in this Supplement, commencing on p. 64).

5.—Head Flattening. E. T. C. Werner, Peking.

The complete paper will be published in the American Journal of Physical Anthropology.

Discussed by Davidson Black and Ales Hrdlicka.

6.—Anthropologisches Studium Uber Untereextremitaten der Chinesen. Kotaro Shin0, Department of Anatomy, South Manchuria Railway Medical School, Mukden.

[Read by title.]

7.—Observations Made at the Second Chinese Government Animal Experimental Station. Chou Wei-lien, Director, Second Zoological Experimental Station, Peking.

Discussed by R. S. Greene.

The speaker dealt first with the selection and choice of material. He pointed out that much valuable information could be obtained by the use of even the simplest instruments but that all measurements must be in the metric system since that is the international standard. The use of the most common anthropological instruments was dealt with briefly and then a résumé of the methods of recording and analysing results was given. Finally Dr. Hrdlicka spoke of the use and value of photographic records and laid stress on the necessity of having clear full-face and profile photographs taken without the presence of any head dress or head covering.

A circular containing a detailed account of the chief methods described will soon be submitted for publication in the China Medical Journal.


After briefly describing the technique which he used, Dr. Tang discussed the results of his investigations dealing with the comparative distribution of Paneth cells, their relationship to the mucous cells and the so-called “yellow cells,” their behaviour in starvation and their structure.

10.—A Review of Chinese Anatomy from the Period of Huangti (Yellow Emperor 2697 B.C.) E. T. Hsieh, Department of Anatomy, Peking Union Medical College.

There are many records of human dissection in Chinese history. Chi Pe (岐伯), the servant of Huangti (2697 B.C.), writes that “after death the body may be dissected and actual observations made.” A little later we read that Yin Chow (殷纣) (1122 B.C.) killed Pi Kan (比干) and dissected his heart to see whether it had seven openings. In the Han (漢) Period (206 B.C.) Wang Mang (王莽) slew Chen Hsun (甄鳬) and dissected his arm; the same gentleman also captured a revolutionary and ordered his physicians to dissect him. Executions were formerly taken advantage of for anatomical purposes. For instance, Liang Shao Pao (梁少保) (960 A.D.) sent his medical officer with an artist to make pictures during an execution of thieves. We read also that in the days of Chia Ching (嘉慶) (1796 A.D.) a terrible epidemic raged among the children in the town of Chang-Li-Hsien
so that many died. A certain magistrate, named Wang Chin Jen, happened to visit the public cemetery where he found that hungry dogs had uncovered the hastily buried bodies and commenced to devour them. Wang's curiosity was so aroused that he went daily to the cemetery and observed over thirty complete bodies dismembered by the dogs. He was thus enabled to test the old theories and to make the important new observations which formed the basis for his book called *A Correction of Faults in Medicine*.

In the beginning, therefore, the science of anatomy in China was based upon the direct observation of the human body. This method has been replaced by a rule of authority somewhat similar to that which existed in Europe before the Renaissance; for we find that *The Essentials of a Gold Medicine Case* and a book on *Fevers* written by Chang Chi in the Han Dynasty (206 B.C.), are very popular to this day. With the re-introduction of direct observation and a true appreciation of the value of experimental methods we may look for great advances.

11.—Seal Characters with Special Reference to Anatomical Terms. J. H. Ingram, Peking.

The light which the archaic writing of Chinese characters throws upon their medical and anatomical knowledge is not inconsiderable.

There is no character which indicates that syphilis existed in China when the written character was being formed. The present character adopted for the disease is an old character and it is described in one phrase, 'a venereal disease.' It is incredible that a disease of the gravity of syphilis could have been dismissed with one sentence, and the terms by which it is known to the laity have all the characteristics of modern construction, just as do their terms for tobacco and maize.

The character for sickness, 醜 (ping), is composed of the symbol for a bed, 亅, and at the top is a horizontal line indicating the position of a sick person. Inside of this character is the third character in the ten stems. This character is supposed to indicate fire. In the seal writing it is a house with fire in it, 戶; in an older writing it indicates a house with the flames bursting through the roof, 戸. Therefore this is not a bad combination for disease—a bed, a person in the recumbent position, and fire, which is used to represent the feverish condition. The small dot at the top of the character was arbitrarily added by the scribes.

The character for pain, 痛, is 痛. In the archaic writing it is composed of 萬, a skein of thread properly twisted and
tied up for sale. It is a finished product. Their symbol for winter is this same character, with the addition of the symbol for ice, 冬. It was the end of their year, when the rivers were held in the grasp of ice, 冬, 冬 winter. Pain was winter plus the radical 安, 疼, described above. What can be more painful than the biting of frost? This was the symbol adopted for pain.

We will next take up the character for malaria, 疟, 疟. Here again we have the radical for disease, 病. Inside we have the character for chapter, 章, 章. 章, 章, was composed of 安, 安, and 安. Ten strains, according to the Chinese idea, formed a complete musical composition. This character was originally used for a composition or piece of music. It afterward was used for a chapter of any kind of writing. As malaria seemed to run a uniform course, chill, fever, sweat, and recovery, therefore they considered it as coming in chapters, 章.

The name of dysentery is 痢, 痢. It is an old character and shows that the disease has been prevalent for five thousand years. This also is composed of the radical for disease, 病, and inside is a symbol which indicates the cutting of grain with a reaping hook, 利, 利. The original meaning of this phonetic was to cut or to reap with a hook, an operation which did violence to the standing grain; and, as dysentery is very painful and destructive, this phonetic was adopted. Dysentery is spoken of generally as 痢疾, 痢疾. The second character also has the radical for disease, and the symbol for an arrow beneath it, 病. A 病 disease was one that came suddenly, like an arrow wound. It also means a serious ailment. The two terms, 痢疾, 痢疾, together describe the disease very properly.

The term for smallpox, 痘, 痘, indicates that this disease also has been prevalent for thousands of years. It also has the radical for disease, 病, and beneath it is an old writing for a dish, the 痘, 痘. The most archaic writing is a dish with something in it, and this writing is very suggestive of the umbilicated postules of smallpox, the most characteristic feature of the disease.

The term for delirium, 狂, 狂, indicates that hydrophobia has been known to the Chinese from the very commencement of the written language. This character is composed of the radical for dog, 狂, plus a symbol which indicates tufts of grass growing promiscuously in the field, 荒, 荒. This phonetic is used with characters where the idea of rambling without any definite object is set forth. Thus the old meaning of the character 狂, 狂, was a rabid dog, but it is now used for expressing any kind of delirium.
Seal Characters and Anatomical Terms.

The character ya, 妖 婢, ugly, inferior, indicates that tuberculosis has also been in existence thousands of years. The seal writing, according to the oldest authorities, represents two hunch-back men speaking together. The fact that there are two indicates that the disease must have been prevalent.

The term tien, 田, is used for an unbalanced condition of the mind. In the seal writing, 真, chen, on the left side means true, and on the right side is a representation of the head 头, the explanation being that the true nature of the individual has escaped through the fontanels, and thus he is deranged.

Their character for medicine, 薬, yao, originates in their character for music, 音. The Chinese have only five tones in their scale, and the character for music is composed of five bells which are attuned and give the five notes. The central bell is the largest and on either side are the two smaller bells. These five are supported on a rack, and the lower part is the pedestal. Medicine is the vegetable, 薬, 價, which is able to attune the body, bringing it back to normal.

The character for treating disease, 病, is interesting. At the top there is a quiver, 弩. On the right of the quiver there is a hand in the act of doing violence to something, 創, i.e., about to shoot an arrow. Below is the symbol for wine, 葡. The way this is explained is, that in order to cure a malady one must expel the demon of disease by harsh measures, and follow this up with elixirs to restore the patient to his usual bodily vigor.

The deformities of harelip and cleft palate have also been long known to the Chinese. In the archaic writing, 耳, cleft palate seems to be depicted very accurately. This calamity was supposed to be sent in consequence of sin committed. Thus the term for a trespass is this same phonetic, 嗥, with a radical which indicates action, 行, kuo.

The character for child, 儿, er, indicates a child whose fontanels are not yet closed. Originally, I think this was used for either male or female children, but latterly it is largely confined to the former. The seal writing, 妻, depicts the fontanel still open.

The character for heart, 心, 妻, indicates that the Chinese were familiar with the form of the heart and with the auricles and ventricles, as will be seen by a glance at the old writing.

The character for stomach, 胃, 胃, uraei, in the old writing represents a receptacle for rice, 糧, and below this is the character for flesh, 肉, the idea being that it is a receptacle composed of flesh. In the present writing there is no indication of the symbol for rice.
Poison, 

This is in the old writing, weng, a symbol for poisonous plants which grow here and there. This same phonetic, weng, occurs in 

but has a different construction in modern writing, and means to avoid, as in 

which represents a woman placed under lock and key for misbehaviour. A person thus confined was without employment and saw nobody, hence the derived meaning, "to avoid."

12.—The Skull Measurements of Three Hundred, Chinese.
S. H. CHUAN, Director, Army Medical College, Peking.

The data incorporated in the following tables were presented with the statement that, owing to the small number of measurements available from certain provinces, it is to be regarded merely as a preliminary report.

TABLE 1.
Order of Districts Arranged According to Number of Persons Measured.

<table>
<thead>
<tr>
<th>Districts</th>
<th>Number of Persons</th>
<th>Average of Bi-parietal</th>
<th>Bi-Alae-Nasal Average</th>
<th>Occipito-Frontal Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tientsin</td>
<td>83</td>
<td>15.30</td>
<td>3.56</td>
<td>18.90</td>
</tr>
<tr>
<td>Chihli</td>
<td>54</td>
<td>14.85</td>
<td>3.07</td>
<td>18.25</td>
</tr>
<tr>
<td>Kwangtung</td>
<td>50</td>
<td>15.65</td>
<td>4.00</td>
<td>19.80</td>
</tr>
<tr>
<td>Manchu (Peking)</td>
<td>45</td>
<td>15.83</td>
<td>3.66</td>
<td>18.15</td>
</tr>
<tr>
<td>Chekiang</td>
<td>17</td>
<td>15.76</td>
<td>3.64</td>
<td>18.70</td>
</tr>
<tr>
<td>Anhui</td>
<td>17</td>
<td>15.20</td>
<td>3.35</td>
<td>19.22</td>
</tr>
<tr>
<td>Honan</td>
<td>14</td>
<td>14.90</td>
<td>3.33</td>
<td>18.80</td>
</tr>
<tr>
<td>South Kiangsu</td>
<td>14</td>
<td>14.92</td>
<td>3.82</td>
<td>18.25</td>
</tr>
<tr>
<td>Hunan</td>
<td>12</td>
<td>15.40</td>
<td>3.60</td>
<td>19.00</td>
</tr>
<tr>
<td>Hupeh</td>
<td>12</td>
<td>15.00</td>
<td>3.60</td>
<td>18.60</td>
</tr>
<tr>
<td>Shantung</td>
<td>11</td>
<td>15.10</td>
<td>3.86</td>
<td>18.90</td>
</tr>
<tr>
<td>Mongol</td>
<td>11</td>
<td>15.30</td>
<td>3.58</td>
<td>18.93</td>
</tr>
<tr>
<td>Shansi</td>
<td>8</td>
<td>15.60</td>
<td>3.80</td>
<td>18.80</td>
</tr>
<tr>
<td>Fukien</td>
<td>7</td>
<td>15.60</td>
<td>3.60</td>
<td>18.30</td>
</tr>
<tr>
<td>Szechuan</td>
<td>7</td>
<td>15.20</td>
<td>3.40</td>
<td>19.20</td>
</tr>
<tr>
<td>North Kiangsu</td>
<td>6</td>
<td>15.35</td>
<td>3.90</td>
<td>19.05</td>
</tr>
<tr>
<td>Kiangsi</td>
<td>6</td>
<td>15.20</td>
<td>3.40</td>
<td>19.21</td>
</tr>
<tr>
<td>Kweichou</td>
<td>6</td>
<td>15.30</td>
<td>3.60</td>
<td>19.30</td>
</tr>
<tr>
<td>Yunnan</td>
<td>5</td>
<td>15.20</td>
<td>4.10</td>
<td>19.20</td>
</tr>
<tr>
<td>Hsinkiang</td>
<td>3</td>
<td>15.30</td>
<td>3.10</td>
<td>19.30</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>305.96</td>
<td>71.97</td>
<td>377.86</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>15.25</td>
<td>4.10</td>
<td>18.49</td>
</tr>
</tbody>
</table>

Total Number of Persons examined, 388
Anthropometric Measurements of Chinese.

TABLE 2.

<table>
<thead>
<tr>
<th>Order of Districts arranged according to Bi-Partial Average</th>
<th>Order of Districts arranged according to Bi-Alac-Nasal Average</th>
<th>Order of Districts arranged according to Occupito-Frontal Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manchu ... 15.83</td>
<td>Hsinkiang ... 4.10</td>
<td>Kwangtung ... 19.80</td>
</tr>
<tr>
<td>Chekiang ... 15.76</td>
<td>Kwangtung ... 4.00</td>
<td>Hsinkiang ... 19.80</td>
</tr>
<tr>
<td>Kwangtung ... 15.65</td>
<td>X. Kiangsu ... 3.90</td>
<td>Kweichou ... 19.30</td>
</tr>
<tr>
<td>S. Kiangsu ... 3.82</td>
<td>Manchu ... 15.35</td>
<td>Anhui ... 19.22</td>
</tr>
<tr>
<td>Chekiang ... 15.60</td>
<td>Shansi ... 3.80</td>
<td>Kiangsi ... 19.21</td>
</tr>
<tr>
<td>Shansi ... 15.60</td>
<td>Hunan ... 15.40</td>
<td>Yunnan ... 19.20</td>
</tr>
<tr>
<td>Hunan ... 15.40</td>
<td>Fukien ... 3.60</td>
<td>Mongol ... 18.98</td>
</tr>
<tr>
<td>N. Kiangsu ... 15.35</td>
<td>Kweichou ... 3.60</td>
<td>Hunan ... 19.00</td>
</tr>
<tr>
<td>Tientsin ... 15.30</td>
<td>Hupeh ... 3.60</td>
<td>Mongol ... 18.98</td>
</tr>
<tr>
<td>Mongol ... 15.20</td>
<td>Hupeh ... 3.60</td>
<td>Tientsin ... 18.90</td>
</tr>
<tr>
<td>Hsinkiang ... 15.30</td>
<td>Szechuan ... 3.60</td>
<td>Shantung ... 18.90</td>
</tr>
<tr>
<td>Kweichou ... 15.30</td>
<td>Szechuan ... 3.60</td>
<td>Shantung ... 18.90</td>
</tr>
<tr>
<td>Kiangsi ... 15.20</td>
<td>Yunnan ... 15.20</td>
<td>Hanoi ... 18.80</td>
</tr>
<tr>
<td>Szechuan ... 15.20</td>
<td>Yunnan ... 15.20</td>
<td>Mongol ... 3.58</td>
</tr>
<tr>
<td>Yunnan ... 15.20</td>
<td>Shansi ... 15.20</td>
<td>Shansi ... 18.80</td>
</tr>
<tr>
<td>Anhui ... 15.20</td>
<td>Tientsin ... 3.56</td>
<td>Chekiang ... 18.70</td>
</tr>
<tr>
<td>Shantung ... 15.10</td>
<td>Kiangsi ... 3.40</td>
<td>Hupeh ... 18.60</td>
</tr>
<tr>
<td>Hupeh ... 15.06</td>
<td>Szechuan ... 3.40</td>
<td>Fukien ... 18.30</td>
</tr>
<tr>
<td>S. Kiangsu ... 14.92</td>
<td>Shantung ... 3.36</td>
<td>S. Kiangsu ... 18.20</td>
</tr>
<tr>
<td>Honan ... 14.90</td>
<td>Anhui ... 3.35</td>
<td>Chehli ... 18.25</td>
</tr>
<tr>
<td>Chihli ... 14.85</td>
<td>Honan ... 3.33</td>
<td>Manchu ... 18.15</td>
</tr>
</tbody>
</table>

13.—Height, Weight and Chest Measurements of 880 Chinese Students. S. H. CHUAN, Director, Army Medical College.

The measurements reported seem to confirm those of other workers that Chinese students as a class are relatively deficient in lung capacity and that the ratio of their weight to their height is notably less than that of Europeans.


The activities of the Research Committee of the C. M. M. A. for the past inter-conference period have been divided into six sections, and the section devoted to the "Measurements of Height, Weight and Chests of Healthy Chinese" was allotted to me. You can all appreciate that it is difficult for busy medical missionaries to find time to take up the extra duties which are involved in such research problems; but in

spite of this, there has been a fairly satisfactory response to the appeal for these measurements as will appear in the list of those who have sent in contributions to this research problem. I want to thank those who did take this time for such observations, and I am sure the rest of the Committee would bear me out in exhorting others "to go and do likewise." Those who reported were as follows:

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Arthur Locksley, Tientsin ...</td>
<td>122 ...</td>
</tr>
<tr>
<td>Dr. E. Witt, Hungkiang, Hunan ...</td>
<td>130 ...</td>
</tr>
<tr>
<td>Dr. Louise Thacker, Chuanchow, Fu. ...</td>
<td>83 ...</td>
</tr>
<tr>
<td>Dr. W. W. Cadbury, Canton ...</td>
<td>732 62</td>
</tr>
<tr>
<td>Dr. Davenport, Shanghai, Ku. ...</td>
<td>888 ...</td>
</tr>
<tr>
<td>Dr. George Hadden, Yunchowfu, Hu. ...</td>
<td>164 ...</td>
</tr>
<tr>
<td>Dr. J. G. Cormack, Peking ...</td>
<td>288 ...</td>
</tr>
<tr>
<td>Dr. A. C. Hutcheson, Nanking, Ku. ...</td>
<td>160 ...</td>
</tr>
<tr>
<td>Dr. Mary E. Carleton, Mingsen ...</td>
<td>70 ...</td>
</tr>
<tr>
<td>Dr. J. H. Baldwin, Changli, Chibli ...</td>
<td>81 ...</td>
</tr>
<tr>
<td>Dr. C. A. Downs, Changsha, Hu. ...</td>
<td>134 ...</td>
</tr>
<tr>
<td>Dr. Duncan Whyte, Swatow, Tung ...</td>
<td>85 ...</td>
</tr>
<tr>
<td>Dr. Tootell, Changtch, Hu. ...</td>
<td>313 ...</td>
</tr>
<tr>
<td>A Dutch Doctor from Java (name unknown)</td>
<td>56 ...</td>
</tr>
<tr>
<td>Total ...</td>
<td>3143 215</td>
</tr>
</tbody>
</table>

When we come to a report on the same results shown by these statistics gathered from different quarters of China we find that the report of Dr. Duncan Whyte on the same matter at the last Conference in Canton leaves little new to be said, and that what has been done during this term is merely more or less corroborative of what he did and what he found out during the study of his 3166 cases.

The report by Dr. Whyte, which was printed in the China Medical Journal, May and July issues, 1918, is so full and takes up so many phases of this subject of the relative heights, weights and chest measurements of the Chinese, both as regards Europeans and as regards different parts of China, that I shall not try to cover the matter again, but simply try to bring out additional data which have been acquired during the survey of the last three years.

I find, just as one would expect from the casual study of the Chinese, that the heights and weights of the Chinese beginning at Canton increase steadily up to Peking. There were no reports from the province of Shantung, so that I am not in a position to state whether the generally credited statement that the Shantung men are taller than those of other provinces is true or not. The chest
measurements do not seem to bear such steady relationship to latitude in China as the former two measurements. All measurements, however, are quite below those of the same age in England and America.

The relation of weight to height, or "the weight for height index" in China is quite different from that which is normal in England. For instance, a man who is 64 inches high in England, should weigh somewhere around 144 pounds, whereas we find that in South China the average will be something like 119 pounds. The weight would be somewhat higher in Chihli, but even there the weight remains much below the Western standard.

Another point has come out clearly in these data. Wherever examined, the measurements of adult coolies are much higher than the measurements of students. In one report, for instance, where the measurements were of coolies picked for service in France, the difference between them and the students of the same province was very marked. In looking for an average, however, one should not take any one class, and it would be well if we could have such data from as many classes as possible.

It would be most interesting to have statistics from West China, Szechuan in particular, for the few Szeehuanese who were included in examination of students made in other provinces made a very low showing. The same can be said of the seven men from Kansu. We hope that someone will send in a report of a survey made in these western and south-western provinces, for only a large number of men measured within their own province gives any reliable data on such a matter as this.

Unquestionably, the average standard for the Chinese is lower in height, weight and in chest measurement than that of the average American or Englishman. Just how much of this is racial is a question which we well might ponder over. In other words, this very apparent difference may not be simply a different normal for two races, but it may have some relation to diseases such as hookworm and to bodily nutrition which is not sufficient to develop the Chinese to the normal. In other words, I raise the question whether the averages as determined for China are after all normal. Certainly one sees more well nourished, well fed people down in the rich cities of Soochow and Hangchow than one does in the average city or town in poorer sections of the country.

I submit in a different paper the averages as determined by me for different provinces from which my measurements come, but I will not take time to read them here. I shall hand these, along with
the original reports themselves, to a future Committee to file for
further use.

I am convinced that this determination of normal standards or
normal averages for the Chinese in height, weight and chest
measurements, is worth while, and I think that not only the questions
of life insurance, and proper dosage of drugs in relation to size and
weight of the individual, but other matters bearing on medicine as well
as economics are helped by such a determination of these standards
for China.

<table>
<thead>
<tr>
<th>HEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chihli ... ... ... ... 5-ft. 6.5-in.</td>
</tr>
<tr>
<td>Shantung ... ... ... ... 5', 6.0 ',</td>
</tr>
<tr>
<td>Kweichow ... ... ... ... 5', 5.6 ',</td>
</tr>
<tr>
<td>Kiangsu ... ... ... ... 5', 5.4 ',</td>
</tr>
<tr>
<td>Fukien ... ... ... ... 5', 5.5 ',</td>
</tr>
<tr>
<td>Hupeh ... ... ... ... 5', 4.4 ',</td>
</tr>
<tr>
<td>Anhwei ... ... ... ... 5', 4.8 ',</td>
</tr>
<tr>
<td>Chekiang ... ... ... ... 5', 4.1 ',</td>
</tr>
<tr>
<td>Hunan ... ... ... ... 5', 8.8 ',</td>
</tr>
<tr>
<td>Kwangtung ... ... ... ... 5', 3.3 ',</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiangsi ... ... ... ... 113.6 pounds</td>
</tr>
<tr>
<td>Chihli ... ... ... ... 126.4 ',</td>
</tr>
<tr>
<td>Kiangsu ... ... ... ... 122.2 ',</td>
</tr>
<tr>
<td>Shantung ... ... ... ... 121.0 ',</td>
</tr>
<tr>
<td>Kweichow ... ... ... ... 130.0 ',</td>
</tr>
<tr>
<td>Kwantung ... ... ... ... 121.4 ',</td>
</tr>
<tr>
<td>Chekiang ... ... ... ... 118.5 ',</td>
</tr>
<tr>
<td>Anhwei ... ... ... ... 112.0 ',</td>
</tr>
<tr>
<td>Hupeh ... ... ... ... 112.0 ',</td>
</tr>
<tr>
<td>Fukien ... ... ... ... 112.0 ',</td>
</tr>
<tr>
<td>Hunan ... ... ... ... 110.6 ',</td>
</tr>
<tr>
<td>Szechuan ... ... ... ... 109.4 ',</td>
</tr>
<tr>
<td>Kiangsu ... ... ... ... 109.0 ',</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Forced expiration)</td>
</tr>
<tr>
<td>Kweichow ... ... ... ... 32.80 inches</td>
</tr>
<tr>
<td>Kiangsu ... ... ... ... 32.80 ',</td>
</tr>
<tr>
<td>Fukien ... ... ... ... 32.40 ',</td>
</tr>
<tr>
<td>Chekiang ... ... ... ... 29.60 ',</td>
</tr>
<tr>
<td>Hunan ... ... ... ... 33.20 ',</td>
</tr>
<tr>
<td>Chihli ... ... ... ... 30.40 ',</td>
</tr>
<tr>
<td>Kwangtung ... ... ... ... 30.40 ',</td>
</tr>
<tr>
<td>Anhwei ... ... ... ... 30.60 ',</td>
</tr>
<tr>
<td>Hupeh ... ... ... ... 31.80 ',</td>
</tr>
<tr>
<td>Shantung ... ... ... ... 31.75 ',</td>
</tr>
<tr>
<td>Kiangsu ... ... ... ... 30.20 ',</td>
</tr>
<tr>
<td>Kiangsi ... ... ... ... 30.05 ',</td>
</tr>
</tbody>
</table>
16.—The Origin of the Vitreous. Harvey J. Howrad, Peking Union Medical College.

A study of the congenital anomalies of an eye removed from an infant five weeks old has revealed a very unique morphology of the vitreous which appears to throw light upon a much disputed embryological question, viz., the origin of the vitreous.

A special method of staining which brought out the vitreous fibres in a remarkable manner made it possible to distinguish three varieties of fibers according to their position and morphology: (1) The fine protoplasmic connecting fibrillae found between folds of transitional retina adjacent to the ciliary body. (2) The delicate fibres which come from the innermost cells of the pars ciliaris retinae. (3) The numerous coarse fibres which come from the cells of the persistent tunica vasculosa lentis. The persistence of the hyaloid vascular system and the proliferation of its connective tissue element caused a non-arrested development of these vitreous fibers which in normal cases should disappear together with the hyaloid vascular system between the eighth and ninth month of fetal life.

A review of the theories concerning the origin of the vitreous include:

I.—A mesodermal origin from—
1.—Embryonic connective tissue entering the globe through the fetal cleft.
2.—Embryonic connective tissue entering the globe over the lip of the secondary optic vesicle.
3.—Cells entering with and proliferating from the hyaloid vascular system.

II.—An ectodermal origin from—
1.—The retina.
   (a) The innermost cells of the whole embryonic retina.
   (b) The innermost cells of the pars ciliaris retinae only.
   (c) Proliferation of Muller's cells or neuroglia tissue.
2.—The basal cells or cones of the primordial lens.

The histologic findings of this case support the theory of the mixed origin of the vitreous. It presents two forms of ectodermal vitreous, both from retinal cells. It vividly demonstrates a mesodermal vitreous about which there has been much dispute for several decades.
Based upon the findings of this case and the histology of the normal embryo, the following chronologic and genetic classification of the vitreous of the human eye is suggested:

1. A transitory ectodermal vitreous originating from the innermost cells of the primitive retina and from the basal cones of the primordial lens.

2. A transitory mesodermal vitreous originating from the connective tissue cells that enter with or proliferate from the hyaloid vascular system.

3. A definitive or permanent ectodermal vitreous originating from the cells of the pars ciliaris retinae.

Discussed by Charles Lewis, Davidson Black and E. V. Cowdry. (The complete paper appears in this Supplement, commencing on p. 47).

17.—The Secretion of Urine in the Camel. B. E. Read, Peking Union Medical College.

The observations described were based upon the study during a period of three months of the urine of an adult female camel weighing 1129 lbs. The speaker pointed out that his observations were as yet incomplete in many details and that further extensive work was planned both on this animal and on others. During ten days during which the animal was deprived of water, but not of solids, the volume of urine secreted daily fell from approximately 4,000 mils to 1,800 mils, and several days were required after water was again provided before the normal rhythm was established. Contrary to the observation of Leonard, this animal did not exhibit much evidence of water hunger at the expiration of its ten days of deprivation of fluid.

Discussed by Davidson Black

18.—The Application of X-Ray Study to Certain Anatomical Problems. Paul C. Hodges, Peking Union Medical College.

[Read by title.]


[Presented by the Chairman in the absence of the author.]

The report contains a brief account of the history and organization of the Wistar Institute, the research work which is being carried out under its auspices and its activities in the publication of scientific journals. The very real service which the Institute is
performing in the development of the sciences of anatomy and biology in the Orient, through the distribution of journals free of charge, and by the training of Chinese students in its laboratories is described in detail. The report is written primarily for circulation in China and will soon be printed in Chinese and widely distributed.

20.—The Comparative Anatomy of the Mastoid Region.

**Jui Hua Liu**, Peking Union Medical College.

The results of a preliminary survey of the mastoid region in representatives of several classes of vertebrates were described with a view to the delimitation of a specific problem for further study.

Discussed by Ales Hrdlicka and Davidson Black.


**Davidson Black**, Department of Anatomy, Peking Union Medical College.

The material on which this preliminary study is based was obtained through the courtesy of Professor H. F. Osborn and Dr. W. D. Matthew of the American Museum of Natural History, New York. The extinct artiodactyle ungulates known as "Oreodonts" were confined in their distribution to North America, where their remains are found in large numbers in the western middle Tertiary deposits of that continent. As the present report is only of a preliminary nature, description will be restricted to the configuration of the cerebral surface of these natural endocranial casts.

In view of Leidy's original description of these animals as "ruminating hogs," it is of interest to note that the fissural pattern of their cerebrum shows some similarity to that obtaining in modern pigs as well as certain ruminant characters. In addition, these casts present both primitive and unique characters. Certain of these peculiarities may be summarized as follows:

1. *Suwined characters:* apparent continuity of coronal and splenial sulci in one specimen; caudal position of the ramus posterior of the suprasylvian sulcus.

2. *Ruminant characters:* small size of the ramus descendens posterior of the suprasylvian sulcus; presence of a trigonum sylvii as described by Holl and also in Moschua by Elliot Smith.

3. *Unique and Primitive characters:* very large pyriform area and olfactory tubercle (the bulk of the cerebrum ventral to the rhinal fissure being almost equal to the neopallium); very small area of neopallium rostrad of the trigonum sylvii.
A more extensive report will be published subsequently in which the characters here noted will be discussed, and the cerebellar and basal configuration of the endocranium of these forms will be considered.

Discussed by Ales Hrdlicka.

22.—The Birds of North China. G. W. D. Wilder, Peking

A comparison of the bird fauna of Peking and its environs with that of the city of New York showed a balance in favour of the former locality in the number of species recorded but in favour of the latter in the number and variety of forms breeding within its limits. The speaker further pointed out that, though New York State and the Northern half of Chihli compare favourably in size, latitude and diversity of surface, yet of all the birds observed only twenty-seven species are identical in the two countries. In conclusion, Dr. Wilder noted that though the number of identical species is small in the two localities, yet almost every species known in America has a corresponding similar one in China to fill the same place in the economy of nature.

Discussed by Ales Hrdlicka and Shun Ichi Ono.

23.—The Innervation of the Soft Palate. M. Inouye, Department of Anatomy, Tokyo Imperial University, Japan.

The results of this investigation show that the m. uvulae is innervated, not from the pharyngeal plexus as described in current text books, but by way of the palatine nerves, ciliary ganglion and second division of the trigeminal. The passage of motor fibers to this muscle by way of the petrosal branch of the facial was excluded and movements of the palate were elicited by stimulation of the peripheral cut end of the trigeminal.

(The complete paper appears in this Supplement, commencing on p. 58).

24.—The Relation of the Interstitial Cells of the Reproductive Organs to Secondary Sex Characters in the Domestic Chicken. Alice M. Boring, Peking Union Medical College.

The influence of castration on secondary sex characters has been claimed by many investigators to be due to an internal secretion of the reproductive organs. I have made a histological study of the reproductive organs of the domestic chicken and have not been able to identify any interstitial gland cells in the testes, but in the ovary I have found groups of glandular cells which so closely resemble the
corpus luteum cells of mammals in structure, origin and fate, that Dr. Pearl and I have ventured to call them lutear cells instead of interstitial cells. These cells have been demonstrated by some of Whitehead's methods, such as Mallory's stain and Mann's methyl blue-eosin.

Goodale has shown that castration of a male bird produces juvenile characters instead of female, but castration of a female bird produces male secondary sex characters. As the interstitial or lutear cells of the ovary are the only glandular elements in the reproductive organs, the inference may be drawn that these interstitial or lutear cells are responsible for the female secondary sex characters by the inhibition of the male secondary sex characters.

A histological study of the testis of the Sebright bantam shows it to contain a cellular element absent in the testes of all other breeds of poultry studied, namely, groups of glandular cells resembling the interstitial or lutear cells of the chicken ovary. As the Sebright cock has the peculiarity of being hen-feathered, that is, of possessing at least one female secondary sex character, the presence of the lutear cells in its testes suggests that these lutear cells may here also in the male be connected with the female secondary sex characters.

Morgan has discovered that the castration of a Sebright cock causes it to become cock-feathered, therefore it would seem as though the presence of the testes inhibited the development of the male secondary sex characters. If the interstitial or lutear cells have this effect in the ovary, where they are present in all breeds, they probably have the same effect in the males of this breed where they are present in the testes.

This general paper is based on several years of work, the details of which are described in five previous papers, as follows:


Is is hoped eventually to continue this work by a histological study of the testes of both the hen-feathered and cock-feathered males of the Campine and Hambourgh breeds, and also by a study of the testes of birds having varying seasonal plumage.

25.—A Study of the Differentiation of Blood Cells in the Bone Marrow with the Aid of Janus Green and Other Supravital Dyes. E. V. Cowdry, Department of Anatomy, Peking Union Medical College.

[Read by title.]

In 1914, with the aid of the supravital stains, janus green and diethylsafranin, I confirmed and extended the observations already made by other workers on mitochondria in human blood cells in fixed and stained preparations (Cowdry, Internationen Monatsschrift f. Anatomie u. Physiologie, Bd. xxxi, page 267).

During the past three years I have extended my observation with these dyes to the bone marrow, where I have also studied the Golgi apparatus by a variety of methods. I have failed to find any indication that either the mitochondria or the Golgi apparatus become transformed into hemoglobin or specific granulations in the course of differentiation of the cells of the erythrocytic and leucocytic series, as has been frequently claimed. It would, however, be premature to say that they play no part in the formation of these specialized cell products. The statement, which we meet with so frequently, that the mitochondria disappear in proportion as these products are formed, is very difficult to substantiate owing to the progressive alterations in the volume of the cells and to the impossibility of estimating either the mitochondria or the products of differentiation quantitatively with any degree of accuracy by means of our present methods. I am accordingly trying to discover whether the mitochondria and Golgi apparatus vary independently of the hemoglobin and specific granulations, the supposition being that, if it is possible to increase or decrease the former materials without influencing the development of the latter, or vice versa, we may then say with confidence that they are in a measure distinct genetically. Thus far I have been studying the bone marrow of guinea-pigs poisoned with lead and phenylhydrazine with results which are encouraging but not sufficiently clear-cut to permit me to make a definite statement. I hope soon to experiment on the lymphocytic and leucocytic series with X-ray and benzol respectively.

26.—Some Growth Changes in the Walls of the Thorax in the Human Fetus. C. K. Roys, Department of Anatomy, Shantung Christian University, Tsiananfu.
The Mitochondria of Somatic Cells of Ascaris.

This paper was presented by the Chairman owing to the serious illness of the author. It consists of a careful series of measurements which were made, for the most part, in the Institute of Anatomy of the University of Minnesota, the idea being to investigate the rate of growth in the fetal as contrasted with the better known embryonic stages of development. The results are graphically illustrated in an extensive series of curves which show the rates of growth in respect to the thoracic index, the length and diameter of the thorax, the infrasternal angle and other important points.

27.—The Surgical Anatomy of the Ovary with Special Reference to the Blood Supply. S. J. Kirkby-Gomes, Peking.

[Read by title.]

28.—Cytological Re-Investigations on the Somatic Cells of Ascaris, with Special Reference to Mitochondria. Shun Ichi Ono, Tokyo.

The Muscle-Cells of the Body-Wall.

1.—The mode of motor innervation, by means of insignificant side branches of nerve-fibres with their terminal apparatus, (Deineka, 1908, '12), has been wholly confirmed both in A. megalocephala and A. lumbricoides by repeating his vital-staining, total-preparation-method.

2.—To a certain extent, there is a syncytial relation among the muscle-cells themselves, but they have no such relation to the nerve fibres.

3.—In living cells, vitally stained with methylene blue, we can distinguish cytoplasmic supporting fibrils, mitochondria, structures which correspond to the "chromidia" of Goldschmidt, and lipoids and fat-droplets in an entirely homogenous cytoplasm proper, which has a more or less cloudy appearance according to the amount of glycogen therein contained.

4.—Application of about twenty kinds of fixing reagents in their different combinations show us distinctly the counter-actions among various components of the mixtures used, with regard to the fixation and destruction of mitochondria, lipoids and fat-droplets, etc. in the cells.

5.—Mitochondrial fixatives containing osmic acid also fix glycogen in an excellent manner, making the latter at the same time quite persistent against water, so that we can freely counterstain mitochondria and glycogen (e.g., with iron-hematoxylin and Best's carmin) and study them side by side in one and the same preparation.
Mitochondria may contain glycogen, but I have seen no evidence in favour of the belief (of Arnold and others) that glycogen is produced by mitochondria.

6.—For the demonstration of cytoplasmic supporting networks we must always adopt a non-mitochondrial fixation. The most satisfactory method, to which no method of former investigators (Butschli, Rohde, Apathy, Goldschmidt, Vejdowsky, Bilek) can be compared, is to combine R. Cajal’s silver-process (after the modification of Kovalsky and Boule) with subsequent iron-haematoxylin staining. Such a method only can reveal the networks in their actual finest details, while the ground cytoplasm retains its homogeneous appearance.

7.—By the application of mitochondrial methods in the cytoplasm, even when it retains its homogeneous appearance, we can never observe the fibrillar networks as in the case described above; whereas the mitochondria proper (in *A. megalocephala*, Romeis, 1913) are richly distributed throughout the cytoplasm, especially abundant, however, (a) in the sarcoplasmic axial part of the longitudinal processes, in (b) the perinuclear and (c) peripheral regions of the medullary sac and, finally, in (d) the medullary processes. Their forms vary from minute granules to long filaments, which through anastomosis, apparently in connection with cytoplasmic fibrils, may form mitochondrial networks.

8.—In normal, well-nourished specimens filamentous forms predominate everywhere, except in the innermost zone of the perinuclear region, where we usually observe an abundance of minute mitochondrial granules.

When starvation begins, however, the filamentous forms become granular ones, some by diminution, others seemingly by segmentation, while still others by the fusion of two or more of them, may form globules, clumps, etc., usually connected by supporting fibrils; in short, the whole number and quantity of mitochondria gradually diminish to a very small minimum at the end of about 10 days starvation. There is no “individuality” in mitochondria.

9.—Besides the mitochondria proper, an amorphous substance, which may also be called mitochondrial, is contained throughout the cytoplasm. When the cell is fixed and stained by mitochondrial methods, we are unable to reveal the fine details of supporting networks, because both networks and cytoplasm are impregnated with this substance, which, being fixed and stained, overshadows the entire details, except some fragmental portions of fibrils, located here and there in the cytoplasm, which being in the closest
connection with the neighbouring mitochondria contain a much larger amount of mitochondrial substance than the surrounding cytoplasm.

*The Epithelial Cells of the Intestine.*

1. Observations were made upon these cells from the same point of view with concordant results.

2. There is a distinct bipolarity in the cell with regard to mitochondria as well as to its lipoidal plasma-membrane.

**General Considerations**

1. The effect of different osmotic pressures in the surrounding medium upon mitochondria was studied, both during life and fixation. My results confirm the observations made by Lewis and Lewis (1915), Sjövall and Bang (1916), N. H. Cowdry (1917), Guilliermond (1918), and others.

2. By a comparative study in *Ascaris* and in other animals of various kinds of cells equally rich in plasma, I am able to confirm Koltzoff's generalization that all cells of this nature contain a system of supporting fibrils.

3. The term "chromidia" of Goldschmidt has been applied to substances of different origin. My observations also show that for the most part these are degenerative products of heterogeneous cytoplasmic origin.

Discussed by E. V. Cowdry, R. S. Stone and E. C. Faust.

(The paper complete is published in this Supplement, commencing on p. 23).

29. **The Effect of Starvation and Refeeding upon the Mitochondria and Other Cytoplasmic Constituents.** Shun Ichi Ono, Tokyo.

The results of this investigation show that the mitochondria in the intestinal cells of various animals undergo definite alterations on inanition.

They decrease in number, size and total amount in somewhat the same way as I have already described for *Ascaris*. On refeeding the mitochondria increase, filamentous forms regenerating from the minute granules which resulted from the starvation. Some evidence was also discovered in favour of the conclusion that other granules, and the filaments formed from them, arise *de novo* in the cytoplasm. There seems to be a reciprocal relationship between the amounts of mitochondrial and nucleolar material, especially during the regeneration of the mitochondria resultant upon refeeding. Both glycogen and fat-droplets disappear completely during starvation. On
refeeding they reappear, the former being produced entirely by the ground substance, while the latter are formed from granules the nature of which has not yet been determined.

Discussed by Charles Packard and E. V. Cowdry.

(The paper complete was not received in time for publication in this Supplement).

30.—The Effect of Radium on Cell Division. Chas. Packard, Peking Union Medical College.

The investigations now in progress are planned with a view of determining how radium radiations affect cell metabolism. My previous studies have shown that the rays may stimulate cells to divide at a faster rate than normal, or may retard their cleavage, the difference in reaction depending on the physiological state of the cell at the time of radiation. In general, cells are most sensitive when they show the highest rate of metabolism.

This is indicated by the results of experiments now in progress. If protozoa are radiated at different temperatures, ranging from 10 degrees to 25 degrees Centigrade, they show an increasing sensitiveness as the temperature rises. This sensitiveness, as measured by the length of a lethal dose, approximately doubles with each increase of 10 degrees Centigrade. The parallel between this phenomenon and increased metabolism at higher temperatures is obvious.

A further series of experiments is also in progress. I have found that cells containing chlorophyll (either plant or animal cells) are more sensitive to radiation than cells which contain none, and furthermore, that in darkness, these cells are more sensitive than in light. The relation between sensitiveness to the radiations and the process of photosynthesis is the object of the investigation.

These studies have been made possible through the generosity of the China Medical Board which provided the radium preparation.

Discussed by P. C. Hodges and E. V. Cowdry.

31.—The Present State of the Schistosome Problem. E. C. Faust, Peking Union Medical College.

The author first remarked that the Schistosome problem is probably as old as the human race, Ruffer having discovered Schistosome eggs in the kidneys of Egyptian mummies (1250-1000 B.C.). He then outlined the occurrence of Schistosomes in different parts of the world, referred briefly to some recent work of his own on some Japanese, South African and South American specimens, and concluded by mentioning certain practical points of diagnosis.

Discussed by Shun Ichi Ono and E. C. Faust.
Problems of Human Embryology.

27.—Problems Under Investigation in Connection with the Collection of Human Embryos. E. V. Cowdry, Peking Union Medical College.

[Read by title.]

A detailed study on the relative rate of growth of Chinese embryos and fetuses is well under way. The object of the work undertaken is to determine the normal growth curves of the different organs and parts of the body and to compare them with American and European standards as worked out by Jackson and others.

Special attention is being paid to the ductless glands because of the evidence at hand which indicates that they play an important part in the development of racial characters. Arthur Keith feels that the thyroid is the most important. He attributes the arrest in the growth of Mongols, which is manifested particularly in the basal part of the skull, "with the result that the root of the nose appears to be flattened and drawn backwards between the eyes, the upper forehead appears projecting or bulging, the face appears flattened, and the bony scaffolding of the nose, particularly when compared to the prominence of the Jews, is greatly reduced," to a reduction or alteration in the activity of the thyroid. In Europeans we meet with a different series of characteristics. "The sharp and pronounced nasalisation of the face, the tendency to strong eye-brow ridges, the prominent chin, the tendency to bulk of body and height of stature" are, in his opinion, indicative of a relatively high grade of pituitary activity. Keith also explains the relatively beardless face and the tendency to an almost completely hairless body of the Mongol as a manifestation of abeyance on the part of the interstitial glands. He supports the old thesis that the original colour of man's skin was black and says that "we Europeans owe the fairness of our skins to some particular virtue resident in the suprarenal bodies" by which the pigment is cleared away. It is our ambition to ascertain whether the glands of internal secretion show any definite changes at the time of incidence of these racial characters.

Thus far we have succeeded in training two Chinese assistants up to the point where they may be relied upon to make fairly accurate determinations of volumes and weights. The method of procedure with each specimen is as follows: after taking suitable photographs and casts, the volume and weight of the whole body is measured and of the parts in the following order: head, arms, trunk, legs, brain, pineal, hypophysis, thyroid (including parathyroids), thymus, lungs, heart, liver, spleen, pancreas, right and left kidneys, right and left
suprarenals, aortic body, and gonads. Care is taken to reduce experimental errors to a minimum and each organ is stored in a separate bottle for further study and histological examination. Since nothing is thrown away the component parts of the body may easily be reassembled at any time.

Since the weights and volumes have only been determined for twelve specimens we are unable to make any generalizations or comparisons. It is evident, however, that when we have proceeded further the results will justify our efforts. If we can manage to collect sufficient material our collection will soon become fundamental, and, in a sense strategic, because it will be the starting point of many problems. For instance, persons wanting to make a special study of the liver, the spleen, the pancreas or what not will want to make use of our series. Those interested in the investigation of Chinese brain power will be glad to examine our neurological specimens. Pathological specimens are being carefully laid aside and variations systematically recorded awaiting a study on the Pathology of Chinese Embryos along the lines of Mall's classical papers. An examination of specimens in the light of complete clinical histories will pave the way for the investigation of the critical period in the influence of the mother on the offspring, the causation of abortion and other problems of immediate practical import.

There are three prerequisites to success in our work in embryology: (1) material, (2) organization and (3) co-operation.

1.—Embryos and fetuses which are ordinarily thrown away will be of the greatest value to us. We need them in large numbers in order to establish our results on a sound basis. Suitable mailing cases have been prepared, and we shall gladly defer any expenses incurred in collecting specimens and sending them to us.

2.—A large collection demands the full-time services of a skilled embryologist whose duty it shall be to organize the work on an efficient basis. Steps are being taken to secure this embryologist.

3.—Finally, co-operation is necessary as all our efforts will be handicapped at the outset unless we can secure the enthusiastic co-operation of members of the medical profession who shall be sufficiently interested to come and work in our laboratories and take an active part in the solution of the problems which confront us.
DEMONSTRATIONS.

1.—The Innervation of the Muscles of the Soft Palate. **Michio Inouye**, Tokyo Imperial University.

2.—Preparations of Mitochondria in the Somatic Cells of *Ascaris*. **Shun Ichino**, Tokyo.

3.—Preparations Illustrating the Effect of Starvation and Refeeding upon the Mitochondria, the Golgi Apparatus and Other Cytoplasmic Constituents. **Shun Ichino**.

4.—Experimental Alterations of the Mitochondria of Plant Cells. **N. H. Cowdry**, Peking Union Medical College.

5.—Microscopical Preparations of the Interstitial Cells of Sebright Testes. **Alice M. Boring**, Peking Union Medical College.

6.—A Demonstration of the Behaviour of Mitochondria in Bone Marrow Cells by Supravital Staining with Janus Green. **E. V. Cowdry**, Peking Union Medical College.

7.—Schistosome Larvae in Man and Other Animals. **E. C. Faust**, Peking Union Medical College.


9.—A Demonstration of Some of Professor Dogiel's Original Preparations of Nerve Endings. **Shun Ichino**, Tokyo.

10.—Preparations Illustrating the Effect upon the Mitochondria in the Acinus Cells of the Pancreas of a Guinea-Pig fed upon Meat and Fat. **Ma Wen Chao**, Peking Union Medical College.
I am to speak to you this evening on the anthropological problems of the Far East. This is no small task, and in the attempt to comply with it I shall barely be able to do more than touch upon the high lights of the question. I shall not be able to go into the many exceedingly interesting details; also I shall not be able to present to you the results of finished studies, but will have to confine myself mostly to generalities, and to conclusions which have been arrived at by investigations in other countries, for the story of the Far East, so far as anthropology is concerned, is still in a large measure a closed book.

The anthropological problems of eastern Asia, including in the first place as it does the vast plains and regions of China, may be summarized under four heads.

The first and most interesting group of these problems comprises the great questions of when and how the great territories in question have been peopled.

The second set of problems embraces those of the diverse and important movements in the Far East populations that took place subsequently to the peopling of the eastern half of the Asiatic continent. These populations have in the course of time overflown the whole Pacific, they have spread into the American continent, and, like the waves of a rising surf, parts of them tried again and again to engulf Asia Minor and Europe.

The third group of the Far Eastern problems are those which relate to the formation of, and the actual differences between, the various present sub-races and nations of these parts of the earth, such as the Chinese, Mongolians, Koreans, Japanese, Malays, etc.

And the fourth series of problems, of particular concern to the non-Asiatic medical men and women practising among the people of the Far East, is just how they differ, in their physical, chemico-physiological, mental, and pathological characteristics, from the white race, with which we are so much better acquainted.

*An address delivered before the Joint Conference of the China Medical Missionary Association and the National Medical Association of China, Peking, February, 1920.
The Anthropology of Asiatic Peoples.

I.—The Peopling of Eastern Asia.

As to when, and how eastern Asia was peopled, we have now some definite facts, which can be supplemented by considerable evidence of a collateral nature. Since 1890-91 we know that in the region represented by the Islands just south of the Asiatic continent, there existed at one time beings of an exceedingly interesting nature, connected with the highest anthropoids but superior to all of these, and in practically every respect far advanced in the direction of the human species. In 1891, on the Island of Java, a Dutch army physician, Dr. Dubois, while searching for the remains of extinct animals, discovered—in the lava beds of the region—the remains of a being which is since known as Pithecanthropus; and this being comes so near the hypothetical and much wished for “missing link” between ape and man, that something more fitting in that respect could hardly be imagined. The remains consist of a large part of the skull (the vault), of three teeth, and of a femur. The individual represented by these remains was nothing abnormal, no freak of nature. He, or rather she—for the remains are in all probability those of a female—was a normal representative of a line of beings which, while not necessarily themselves ancestral to man, cannot but be classed among forms on the way towards man, among forms which deserve the name of human precursors.

This class of beings lived on the Island of Java and undoubtedly in the neighbouring regions, somewhere about the beginning of the Pleistocene period or Ice Age, or roughly about one million years ago. In every respect they were already far advanced in their differentiation from the apes that must have preceded them in those lands, and it is quite plain that their existence must have extended over a very prolonged period of time. It is further certain that they must have been preceded as well as followed by other, perhaps many, similar forms that filled the gaps between them and the apes on one hand, and them and the earliest of really human beings on the other. And the more advanced forms must have spread over large parts of southern Asia, possibly as far as the present southern territories of China. Their skeletal remains could not have all disappeared. In all probability many such remains, even though in fragmentary state, lie to this day in the caves and the late Pliocene to early Pleistocene deposits of southern and south-eastern Asia; and when proper intensive search can be instituted it will not be long before some of them will be discovered, as similar remains of early man have been discovered in Europe. For anthropology southern Asia is a great Pandora box, in which there is doubtless hidden many a precious gem.
of information, and the time is nearing when this box, too, will be made to open to science.

But meanwhile the student of anthropology in Asia finds himself confronted with many perplexities. The main one is that he can locate here no separate progeny of those early forms that, everything leads us to conclude, must have once peopled the southern parts of the continent. He has ample evidence that sometime about or after the middle of the Ice Age, early primitive human beings had already reached Europe, and that it is in Europe where their further differentiation into modern human forms was gradually accomplished. Find after find of ancient skeletal remains of man has been made in Europe during the last century and especially during the last thirty years, and these remains, even though many stages are still missing, show clearly a gradual progression from the still exceedingly primitive and semi-anthropoid man of Heidelberg, whose age is estimated at possibly as much as 350,000 years, to the man of the latest paleolithic and early neolithic periods, whose skeleton in many respects has already reached the modern form. And it is not the skeletal record only; in addition we find in Europe extensive material evidence of the activities of man from the Heidelberg period or even earlier in the form of stone and bone implements. There are great collections of these in all the more important European museums and universities, and more are constantly being discovered.

Strangely, nothing of similar nature is as yet known from outside of Europe and the adjacent territories; and nothing in particular from eastern Asia. It is true that outside of America, perhaps, no country has been explored anywhere near as intensively as Europe. Yet ancient stone implements and even some early skeletal remains were known in Europe long before real exploration began. On the other hand, many European trained physicians, scientists and other educated men have been in recent years over different parts of eastern Asia; with the Russians diligently exploring in Siberia, and with the Japanese in Korea, Manchuria and Japan; yet to this day there is not known in all these lands a single indubitably paleolithic implement, or a single human bone fragment of any geological age. Some such specimens may yet be found, especially in southern China, but the large fact of great scarcity, if not complete absence, of such relics, remains. And all this can have but one meaning, which is that the Far East, or at least the countries from the southern boundaries of China northward, has had little, if any, paleolithic population. There was no such population, we know, in Micronesia or Polynesia, nor in America, which facts are also instructive.
The reasons for the apparent paradox of the presence of pre-human and possibly very early human forms over doubtless large regions of southern Asia, and the absence or scarcity of early man over the vast area of the central and northern portions of eastern Asia, can mean only one thing, and that is, that the earlier spread of the stock into these territories was hindered by something very potential. Whether this was climate, or other cause, it is as yet too early to say; but climatic conditions, such as a possible semi-desert area over what are now the loess regions of China, should, it would seem, receive the first consideration.

But if there was no early man in ancient central and eastern Asia, whence came the great populations whose home is now and has been for thousands of years in these countries? Could they have come in more recent times from some focus of their own in some other part of Asia? Is it possible that while the white race was slowly evolving in Europe, the yellow-brown races were being developed from other nuclei in southern Asia, and perhaps in other regions, and that these races eventually spread over the far eastern territories? In other words, have the yellow-brown peoples an origin distinct from the white man? Had these countries been peopled by the Negrito or Negro, it would be relatively easy to incline to such opinion. But these vast areas are peopled by a stock which in many important respects stands near to the European and in no essential feature is wide apart. Biologically, the two could scarcely be characterized as even distinct varieties. That two great stocks, apparently so closely related, could have developed separately in far distant parts of the earth, is quite impossible to accept without the most convincing evidence that such was actually the fact, and not a trace of such evidence has as yet been established or even attempted to be established.

What seems most probable in our present state of knowledge, is that both of these great stocks have had a common origin, but became separated long before the white people had become fully differentiated as such. It is quite safe to assume that the European and Asia Minor man of the later phases of the paleolithic period, or say 15,000 to 25,000 years ago, was not as yet physically and otherwise what he is to-day. He may well have been somewhat darker in colour, and presented various other features which later on in Europe gradually disappeared. It is further certain that long before the end of the paleolithic period was reached in Europe and adjacent lands, man had already spread over a large part of the Old World; and as there were no great barriers to his extension over either the Scythian and Siberian plains or over what is now Turkestan, he also spread into eastern Asia. It seems, therefore, quite legitimate to assume that thousands of years
ago offshoots of the western stock had thus reached the Far East, which they gradually peopled to its full, and where they not only preserved some of the more primitive characteristics of the old stock from which they were derived, but where such characteristics (as perhaps the Mongolic eye, the low nose, black straight hair, etc.) may have become accentuated. The normal range of variation of these characteristics in the two races is such that they interdigitate and there is no line or point of demarcation where one race would stop and the other begin. They are connected, and cannot but have had common derivation.

While the yellow-brown strain was spreading over the central and northern territories of eastern Asia, a very interesting and curious development had taken place over a large part of the south-eastern part of the continent. A considerable part of the south-east with the adjacent islands had become sparsely occupied by a wholly distinct people, a peculiar primitive black race, the Negrito. Remnants of this little black race are found to this day in the Andaman and Nicobar Islands, in the Phillipines, and in New Guinea. Traces of the race exist also in parts of Micronesia, Melanesia, perhaps even Australia, in the Malay peninsula, and in Siam. In China some have been observed in its southern parts, in the west as far as Szechuan and on certain small islands off Formosa in the east. Faint traces have even been reported to exist among the Japanese whom they probably reached with some influx from the South. Their origin is still problematical. We know that in various important respects they are related to the African blacks, but they are by no means identical. They are on the way towards extinction, but traces of their blood have modified more or less the traits of the yellow-brown population in many parts of south-eastern Asia and of the Pacific Islands.

Such in brief are the tentative and doubtless very imperfect answers of anthropology to the questions of how and when the Far East has been peopled.

II. MIGRATIONS OF PEOPLES OF EASTERN ASIA.

Our next set of problems relate to the movements of the populations of the Far East since they have reached these countries, and their present affinities as well as differences. In this field much is still obscure and must remain the subject of further investigation; but a few facts have already been established.

The spread of the yellow-brown populations eastward, and in southern as well as northern directions, was not completed until within historic times. Before this they doubtless received various accretions from the west, and formed into groups which differed
more or less in their blood composition, according to the nature and strength of such accretions. They then moved in overflows and streams, mixing further among themselves and with outlying settlers, organizing politically, and eventually forming the present day groups and nations of eastern Asia.

The populations thus formed increased in numbers until they overspread every available part of the Far East, and until they began to exceed the natural resources, the man-supporting powers, of these territories. Then they were gradually forced by the struggle for existence to extend still farther, which led them over the islands of the Pacific. They also spread, following fish and game, along the coasts to the inhospitable north-easternmost reaches of the continent, and having doubtless become fairly efficient navigators by that time, though in small boats, they eventually crossed to the Commander and Aleutian Islands, to and beyond the St. Lawrence Island, over the Bering Strait, and probably also over and to the north of the Bering Sea, until they reached the coast of Alaska. And having once reached the American coast they found a new land, with no one to oppose them, with forests teeming with game and rivers with fish, and climate far superior to the northern stretches of the Asiatic coast. There would then be no incentive to return, except perhaps for their families. In the course of time they would be followed in a similar way by other parties, and such a dribbling over may well have continued for centuries and centuries. The place of those who left would surely be soon taken by others, who in their turn, consciously (i.e., after having learned something of the far-away good lands), or unconsciously, would push on in the direction of America. There they spread rapidly over all parts of the continent, and their descendants constitute to-day the American Indians.

Time and again those of you who follow scientific work in America may have read of supposed discoveries of early man in that continent; but every report of that nature, when properly investigated, has been found to be erroneous, and you may well comprehend why this should be so. Man did not originate in America—there was nothing there from which to originate. He had to come there from elsewhere, and the only practicable route in olden times was that from north-eastern Asia. But before anyone would come over that route it was necessary for Asia itself to be thickly populated, so that man in his struggle for subsistence was forced to follow the game into its north-easternmost cold regions. We now regard the coming of the American Indian to have occurred within only a few thousand years before the discovery of that continent by the white man.
On the south the yellow-brown people penetrated over all Malaysia, but they did not reach more than the outskirts of India, which in the meanwhile must have become strongly peopled by the south-eastern spread of the Semitic and Mediterranean branches of the "white" race. In the west the yellow-brown people spread into Tibet, where eventually they mixed with some Hindustani and perhaps other elements. And to the northward they occupied large parts of central Asia, the whole of Siberia and large parts to the north and east of what eventually became Russia, reaching to the old Esthonians, Finns and Lapps as far as the Baltic and the northernmost limits of Scandinavia.

The westernmost mixed white and yellow-brown groups tried again to penetrate into Europe itself. In the fourth, and again in the ninth century, they succeeded in reaching as far as present Hungary, and establishing their domain in central Europe. They were the Huns, Kumans, Mongols and Tartars of European history. In the thirteenth century they devastated the southern parts of Russia, and for two hundred years held sway in these regions. They destroyed the old central Asiatic empires and penetrated through Iran into Asia Minor, where they at last disappeared. Their living remnants are still scattered over parts of north-eastern and especially south-eastern Russia, and as Tartars of Kirghiz they are well known over much of western Asia.

III.—Differentiation of Peoples of Far East.

As to the more internal movements of the Far East populations and the detailed events which resulted in the formation of the separate groups of Mongolians, Chinese, Koreans, Japanese and Malays, we know little beyond what is recorded in the histories of these nations.

The old population of eastern Asia was doubtless divided into many tribes. Groups of these recognized their common origin and became known by generic names, such as the Tunghuz or Mongols, perhaps as early as 3,000 B.C., or even before. The sedentary tribes of the heart of what is now northern China became gradually organized politically into a unit, and that was the origin of the Chinese nation. The south—as in Egypt—was for a long time "different," even the people being regarded as of distinct blood; but eventually the whole became fused into one body, to which in the course of time were added Tibet, Turkestan, Mongolia and Manchuria. The Chinese remain essentially a yellow-brown people; but there are indications that they also carry a more or less considerable old admixture of white blood of unknown derivation, together with a little of more modern mixture.
Some of the south-western hill tribes are apparently of exotic origin, perhaps Hindustani, Malay, or Negrito.

As to the Japanese, three to four thousand years ago there existed in the islands that now form the empire a mixture of late neolithic yellow-brown populations. They left some of the shell heaps along the coasts. They seem to have been partly related to the Ainu, who themselves were a mixture of whites and yellow-browns, or a branch of the European stock farther advanced towards the white race than the original yellow-brown migrants into the Far East. Then appeared the Tunghuz, who came to the islands many centuries before our era across Manchuria and Korea, and were instrumental in establishing the Japanese nation. Besides this there are evidences of some stream having reached Japan from the south, and there came also some Chinese as well as Koreans, besides a scattering of whites. The latter were unimportant, but, as among the Chinese and Koreans, there are evidences of old white admixture, acquired either through the Ainu, or of unknown still older derivation.

Of all the present larger populations of the Far East the Mongolians represent perhaps most closely the old yellow-brown stock. Yet even they have not escaped admixture of “whites,” particularly in western Mongolia.

The Koreans are a very interesting group, which appear to be most closely related with the Tartars such as are seen to-day in south-western Siberia and south-eastern Russia. There is also some mixture with the Chinese, but the relation with the Japanese is more distant.

The Malays have some admixture of the Negrito, and more or less admixture of the more western populations of southern Asia which are fundamentally of the white stock.

In the Phillipine Islands there is a considerable mixture of people, with pure elements here and there of the Negrito and the old yellow-brown stock (e.g., the Igorots). There are also the Malay, Chinese, etc.

The native Siberians, finally, comprise a few remnants of the old yellow-brown stock (e.g., the Igorots). There are also the Malay, Mongolian or Chinese admixture.

On the whole, it should be repeated, all the older peoples of the Far East are essentially yellow-browns. That they differ from each other is due partly to varying admixtures, particularly, according to many indications, of white blood, and partly to such environmental differentiations as take place among all peoples who have been separated and lead their own life for many centuries. We are naturally still far from being able to say the last word on these questions.
IV.—DIFFERENCES BETWEEN MONGOLIAN AND OTHER RACES.

This brings us to the last series of the anthropological problems in the Far East, which comprise the differences of the various groups now existing in these regions in demographic, physiological, mental and pathological respects, from the white people. These problems are of intense medical as well as anthropological interest, and their solution is indispensable to scientific medicine in these countries. That differences, and in some respects consequential differences exist, we know, but exactly what they are, what they may be based upon, and how far they may affect our medical, eugenic and related endeavours, are questions to be determined only by prolonged and intensive future investigations on these peoples, research in which anthropology will gladly join hands with medicine. Personally, I am not able to throw any special light on these problems, and all I may hope to do is to stimulate some work in these directions. We cannot rely upon mere impressions, which are always deficient and differ from observer to observer; we must have actual, paintaking investigations. The Chinese and Japanese men of science will, I feel confident, gladly co-operate. The studies will not be easy, but they are feasible, and they are a necessity. Let us take feature after feature, function after function, and find out exactly what they are in each of these ethnic groups. There are a large number of men and women belonging to this Association alone who are active in all parts of China as physicians and surgeons, and every one of these can, and I am sure will gladly, contribute as time goes on to our knowledge in some particular. All that is needed for the moment is an organization of effort, to be followed by practical beginnings; and the prospects are that a good step in this direction will be taken before the end of this session.

This concludes in a brief and imperfect way my subject. But I cannot let this occasion pass without calling upon all those here assembled and their colleagues for help, not only in connection with the problems above mentioned, but also with those that relate to man's antiquity and differentiation in these countries. I would like to interest each one of you in the caves of your region, in the tumbling bluffs of your rivers, and in all larger works of excavation that may be carried on in your vicinity. Any one of these may yield remains of historically ancient human beings, and in the south possibly even geologically ancient forms, that would be of the utmost value to anthropology and science in general. Make the lookout, the search for such remains, your sport, your recreation, and you will be amply rewarded. There is nothing more interesting than the search for the remains of man's antiquity, for the old stone objects and skeletal remains of bygone generations. Make it your hobby, and interest in it
everybody about you, your students in particular. Even the coolie can help you. And when you discover anything of interest, mark it properly as to where and under what conditions it appeared, and then send it or at least send a notice of it to this fine College in which you are now meeting, and which has made it its point not only to care for such collections but to help you in every way possible with their determination and publication.

In addition to the old material, however, please bear in mind that it is most desirable for science to obtain the largest possible collections of modern skeletal material, and of embryological specimens; and I trust that large accessions of such specimens will find their way to this College, where all effort will be made to establish a great reference collection of anatomical and anthropological material, which will be of untold service to the scientific investigator and to you as medical men of China in general.
STONE IMPLEMENTS OF NEOLITHIC TYPE IN CHINA

By Dr. J. G. Anderssen.

Three years ago I commenced in co-operation with the Geological Survey of China, a systematic investigation of the late Tertiary and Pleistocene history of Northern China with special reference to the successive mammal faunas which lived in this part of the Eur-Asian continent.

It was natural that in this programme of research due regard would be paid to the appearance of man and to the relics left by early races which once inhabited this area.

In the collection of Chinese fossil mammals described by Schlosser there was a tooth of an anthropoid mammal, and a Japanese scientist Matsumoto has described from Honan a fossil human sacrum which he considers offering striking affinity to the sacrum of the palaeolithic Homo neanderthalensis of Western Europe. These data are too isolated and uncertain to afford any reliable record of Pliocene anthropoids of Palaeolithic man in these tracts.

A number of stone implements of neolithic type found in widely different parts of China, in Chihli, Shensi, Szechuan, Yunnan, Chinese Turkestan and Mongolia, have been described by J. Anderssen, H. Fisher, J. Edkins, E. Colborne Barber, E. T. Hamy, E. T. Giglioli, J. Coggin Brown, R. A. Smith and J. H. Edgar. (See bibliography at the end of this paper.) Most valuable data have been furnished in Laufer's admirable treatise on Chinese Jade, and the Japanese archaeologist Torii has described extensive material obtained by systematic investigations in South Manchuria and Eastern Mongolia.

To this may be added that the Geological Survey of China has recently taken up this line of research and that much fresh material from Northern and Central China is in my possession.

A large bulk of these implements are polished celts, chisels and hammers of various shapes (1). Semilunar knives ("women-knives"), arrowheads and bone implements as well as large masses of pottery debris have been described by Torii. Most of these implements of neolithic type seem to belong to one and the same old culture. At least it is striking how the material recently collected in Honan is similar to the collections made on the Mongolian border.

An interesting feature of this material is the occurrence of types which are characteristic of the tribes of Bering Strait and of the Indians of North America. It does not go too far to say that these finds, such
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Fig. 1.—Stone Chisels and Celts. (Eastern Mongolia).

Fig. 2.—Semilunar Perforated Stone Knives.
(a) Eastern Mongolia; (b, c) Fengtien.
as the semilunar knives (2) still in use amongst the Chukchee of Arctic Asia and the American Eskimo, as well as the grooved hammer of the Chukchee and of the North American Indians, form further arguments in favour of the consanguinity of the American Indians with the peoples of East Asia which has been advocated by, amongst others, the distinguished anthropologist present at this meeting, Dr. Ales Hrdlicka.*

An interesting, not to say the central, problem is the question of the relationship of this neolithic material to the historic archaeology of the Chinese and to recent Chinese culture.

It seems well proved that these stone implements, at least the majority of them, are not prehistoric in the terms of Chinese history, but rather contemporaneous with early dynasties during which bronze was already in extensive use. It has been suggested that stone implements belong, not to the Chinese themselves who had already made use of the metals, but rather to frontier tribes of lower civilization. This may possibly be true as far as concerns the extensive material collected in Manchuria and in Eastern Mongolia, but when we turn to the large collection recently made by us in Honan, a region considered as the cradle of the Chinese race, we have to face only two alternatives, namely, that the stone objects originate from a pre-Chinese unknown people or from a primitive Chinese culture.

I think it premature to try to formulate a definite answer of this question, but will present some new facts which seem to prove that the old stone implements are more intimately related to the modern Chinese culture than has been hitherto realized.

Let us return to the semilunar knives which offer so much interest in another direction.

When I showed the most primitive specimen, not perforated, (3b) to one of my private assistants, who had just returned from northernmost Shansi, he told me that he had seen such a knife made of iron in use at Kueihuacheng for cutting vegetables. I have not yet succeeded in securing a modern specimen of this most primitive semilunar knife, but my man has drawn a contour sketch (3a) which indicates the surprising similarity between the old stone knife and the modern iron knife, both found on the borderlands of Mongolia. It seems already from this statement that we have here, as amongst the Chukchee of Asia and the Eskimo of America, a neolithic type of extreme simplicity surviving in a different material.

*For details on finds of semilunar knives and grooved hammers in China see also the works of Laufer and Torii quoted in the bibliography at the end of this paper.
Fig. 3.—(a) Sketch of Modern Iron Knife. (N. Shansi).
(b) Semilunar Stone Knife. (N. Chihli).

Fig. 4.—Grass-cutting Knives, Anhui (a-d.) and Kiangsu (e).
During my recent journey in the lower Yangtze valley, I saw one day in Anhui two men cutting dry grass on a hill slope. The tool they used struck me as being an old acquaintance in new disguise; it was simply the semilunar knife that had got a handle attached to the blade. Later in the day I bought from a woman a grass-cutter lien-tao (4), as it is called, a specimen so primitive and weak in the attachment of the handle that it removed all my doubts as to the genetic relations of this implement. When once the idea had occurred to me, I commissioned a man to collect farmer's tools of all kinds, and he brought in a variety of iron implements; amongst them were several which I consider as probably derivates of semilunar and rectangular knives with handles attached in several different ways (5).

It will be noted that most of the neolithic semilunar knives have two holes apparently for the purpose of inserting a string. It remained to find out whether these holes have survived in any modern type.

One day in Anhui, I said to my private assistant who was commissioned to collect iron knives, "Do you know of any iron knife without handle but with two holes in the blade?"

"Yes, of course," he answered, "such a knife is used in my country (Chihli) for cutting the spikes of the kaoliang (sorghum)."

I instantly wrote to Peking ordering another man to make a trip for the purpose of getting one of these knives. We see it here (6A), and it shows not only the two holes but also the string that is used to put over the thumb in order to prevent the tool from being lost when the farmers go cutting the kaoliang in the often flooded fields.
Stone Implements of Neolithic Type in China.

The short time at my disposal does not allow me to enter upon the many interesting side-issues offered by these comparisons. It may suffice to say that we have stated the relationship between the semilunar stone knives and some implements of the Chinese farmer of to-day. These simple tools now obtain the significance of venerable antiquity; at the same time they indicate that in the stone implements we may have struck a branch of the root of Chinese culture.

Fig. 6.—(a) Perforated Iron Knife (Chihli).
(b) Unperforated Stone Knife. (Honan).

It may be noticed that some of the most decisive evidence here presented has been in my hands only some few days and that this investigation is just begun. As there is no special Government organ for archaeological and ethnological research, it has been decided by the Director of the Geological Survey to follow up this study with the means at our disposal and to publish the results in the Bulletin of the Survey. The field of research is very far extended and we cordially welcome volunteer co-workers.

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THE ORIGIN OF THE VITREOUS.*

BY HARVEY J. HOWARD, M.A., M.D., Peking China.

In 1917, the writer presented a report from the pathological laboratory of the Massachusetts Charitable Eye and Ear Infirmary of a large number of interesting congenital anomalies in an eye which had been removed from an infant five weeks old because of suspected glioma. The histologic examination revealed that the white glistening body which had been seen without as well as with the aid of an ophthalmoscope, proved to be not a glioma but a dense fibrovascular sheath on the posterior surface of the lens (1).

![Diagram of eye with labels](image)

**Fig. 1.—** (a) Fibro-vascular of the lens showing stub of hyaloid artery. (b) Adhesion of sheath to ciliary body. (c) Adhesion of sheath to transitional retina. (d, d) Posterior synchia. (x 2.5)

The unique morphology of the vitreous in this case seems worthy of further study and report, inasmuch as it appears to throw light upon a much disputed embryological question, i.e., the origin of the vitreous; hence this paper.

*Presented before the Section on Anatomy and Anthropology of the China Medical Missionary Association at its Biennial Conference in Peking, China, February 21-28, 1920.*
The eyeball was sectioned as a whole in the horizontal antero-posterior position. The stained sections show that the vitreous body had retracted on account of the formalin fixation leaving about the posterior one-fourth of the chamber free except for a small amount of coagulated serum and albuminous precipitate. It had also retracted towards the periphery, thereby creating a V-shaped vitreous-free space in the centre of the chamber. This space also contained coagulum.

Examination of the lens shows a cortical cataract. Posteriorly it is covered with a persistent tunica vasculosa lentis, which, on account of a marked proliferation of its connective tissue cells, has become a thick fibro-vascular sheath (2). Near its posterior pole the lens capsule has ruptured. Through the ruptured area connective tissue cells from the sheath have proliferated to a depth of 0.48 mm. The maximum thickness of the sheath external to the capsule is 0.36 mm. In some places the sheath extends peripherally to the equator of the lens. In other places it has proliferated horizontally along the zonular fibres and has formed contact with the ciliary processes on the temporal side (3), and Lange's fold on the nasal side (4). Sections stained with Verhoeff's elastic fibre tissue stain show distinctly many elastic fibres in this sheath. A few elastic fibres are even found mingled with the spindle cells that make contact with one of the ciliary
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Fig. 3.—Temporal View of Lens, Iris, and Ciliary Body.
(a) Fibro-vascular Sheath attached to Ciliary Processes.
(b) Iris Process attached to Lens.
(c) Posterior Synechia and Entropium Uveae (x 30)

Fig. 4.—Nasal View of Lens and Adjoining Structures.
(a) Nucleated Vitreous Fibres coming from Fibro-vascular Sheath of the Lens.
(b) Rudimentary Retina attached to Fibro-vascular Sheath. (x 130)
processes. Throughout the sheath are found cross sections of vessels whose lumens are filled with blood. Near the posterior pole of the lens sheath is a persistent hyaloid artery whose lumen also contains blood cells (2 and 3).

The vitreous fibres were brought out in a remarkable manner by a special method of staining suggested by Verhoeff of Boston, through whose courtesy I have the opportunity of presenting this specimen. The sections selected were first bleached by Verhoeff and Fisher's method, then stained for four hours in Verhoeff's elastic tissue stain, differentiated in a one per cent. solution of ferric chloride, and counterstained in eosin.

Three varieties of vitreous fibres, distinguished according to their position and morphology, were found to exist

Fig. 5.—(a) PRIMITIVE VITREOUS FIBRES.  
(b) RUDIMENTARY RETINA.  
(c) LANGE'S FOLD OF THE RETINA.  (x 150)

1.—The first are the protoplasmic connecting processes found between folds of transitional retina adjacent to the ciliary body. It appears as though the internal surfaces of these folds had at one time been in mutual contact and subsequently separated as the eyeball grew, except for the basal processes of the cells which stretched out into long cones and finally into fine protoplasmic threads. These are best seen in horizontal peripheral sections where the embryonic retina is formed into many lateral plications (3).

2.—The second variety consists of very delicate fibres which appear to come from the ciliary epithelial cells found in the region of the junction of the orbiculus and the first ciliary process. These fibres
sweeping backward in close proximity to the retina are inserted one by one into the internal limiting membrane of that structure. Their number from before backward gradually becomes less until finally they disappear entirely. Their variety of fibres is best seen in sections showing certain areas on the temporal side where there are no obstructions like the folds of Lange which are found on the nasal side, to prevent their uninterrupted course backward along the periphery of the vitreous chamber.

Fig. 6—LARGE VITREOUS FIBRES COMING FROM THE FIBRO-VASCULAR SHEATH OF THE LENS. (X 30)

3.—The third variety is composed of fibres which originate from the cells of the persistent tunica vasculosa lentis (6). These fibres are in general much larger and coarser than the other two varieties. In the region of the posterior pole of the lens and the central axis of the globe, the fibres are the coarsest. Extending from the region of the posterior pole of the lens to the periphery of the fibro-vascular sheath, the fibres gradually become finer but more numerous. They also become finer and finer as they proceed backward in the chamber until finally, viewed with the high power of the microscope, they seem to lose their individual identity. Even then it is possible to see from the differential stain that the fibres as a mass have broken away from their insertion into the hyaloid membrane and have retracted leaving spaces containing coagulum only. The growth of these fibres has taken place in such a way that the outer fibres which are the finer were pressed gradually more and more towards the periphery by the more rapidly growing and consequently the coarser central fibres. The outermost of these fibres
are either in contact with or lie parallel to those of the second variety in their concentric arrangement. Several of the outer fibres are nucleated at or near their origins in the fibro-vascular sheath (4). There are also irregular cross anastomotic fibres which appear to have had their origin in some structure which has intra vitam occupied the central axis of the vitreous chamber. The unfortunate disappearance of this structure, which undoubtedly was a mass of persistent hyaloid vessels, must be considered an artefact.

**Review of the Theories Concerning the Origin of the Vitreous.**

In 1848, Schoeler advanced the theory of the mesodermal origin of the vitreous. He held that embryonic connective tissue gains entrance into the globe through the fetal cleft and the narrow space between the primitive lens and the margin of the secondary optic vesicle. His theory also includes the possibility of a layer of mesoderm between the primary optic vesicle and the superficial ectoderm contributing toward the formation of the vitreous.

In 1879, Herzog stated he believed that the vitreous is developed from the cells of the retina. About twenty years later Carini supported Schoeler's mesodermal theory, while Tornatola and Rabl supported Herzog's theory of ectodermal origin. Tornatola, denying the existence of an internal limiting membrane of the retina, stated that the innermost cells of the embryonic retina are the source of origin of the vitreous and that from these cells little fibres grow out which through numerous anastomoses form the vitreous. Rabl held that the first appearance of the vitreous takes place in the neighborhood of the retina ciliaries prior to the appearance of mesoderm in the secondary optic vesicle.

Since the beginning of the twentieth century, a number of others have written on the development of the vitreous. Wolfrum, von Szily, and Addario consider the vitreous to have a retinal origin. They believe that the fine protoplasmic connecting processes found between the lens primordium and the inner layer of the optic cup in the very young embryo represent the primitive vitreous; also that coincident with the progressive histologic differentiation of the retina the power of the latter to form vitreous progressively diminishes from the region of the optic stalk towards the pars ceca retinae. The final vitreous source, they believe, is confined entirely to the pars ciliaris retinae.

Magitot and Mawas classify the vitreous chronologically into three divisions, viz.: (1) The primitive or primordial vitreous, which is a product of the marginal zone of the embryonal retina. This vitreous is short-lived and has apparently disappeared by the time the
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embryo attains the length of 12 mm. (2) The transitory or neuroglia vitreous, which is marked by a proliferation of Muller's cells into the vitreous chamber and by the growth of a mantle of neuroglia which, according to these authors, appears at the end of the eighth week and envelops the entire hyaloid vascular system. When this system later disappears, the associated neuroglia vitreous also disappears. (3) The final or definitive vitreous, which develops as a fibrillary formation from the entire inner surface of the retina, especially the ciliary portion. Their opinion, therefore, briefly is that the vitreous is directly and entirely of retinal origin and that both vitreous and retina are to be considered a part of the central nervous system.

Other writers postulate the mixed development, i.e., the partly ectodermal and the partly mesodermal structure of the vitreous. Lenhossek advances the theory that the entire vitreous body, except the hyaloid canal, is derived from the primordial lens by the formation of basal cones from which sprout fine little fibres. He considers the hyaloid canal to be the only mesodermal part of the vitreous and that the cells composing it enter with the hyaloid vessels. Kolliker also advocates the theory of the double development, but believes that the ectodermal parts is derived, not from the lens, but from the retina.

Bach, in a joint work with Seefelder, states that "the construction of the vitreous body has entered into a new phase on account of the determination of a connection between ectodermal fibres and mesodermal cells. It has been proved particularly that the epithelial fibres of the vitreous combine directly with the vessel endothelial cells so that a continuous strand of protoplasm is found between Muller's cells in the retina and the endothelial protoplasm." He further says that the question is not so much as to what extent the vitreous is formed by the lens or retina or by both, as it is to what extent the mesodermal tissue participates in the structure. Bach, therefore, accepts without question an ectodermal origin, but only intimates the possibility of a mesodermal origin as well.

The theories reviewed above include:—

I.—A mesodermal origin from—

1.—Embryonic connective tissue entering the globe through the fetal cleft.

2.—Embryonic connective tissue entering the globe over the lip of the secondary optic vesicle.

3.—Cells entering with and proliferating from the hyaloid vascular system.
II.—An ectodermal origin from—

1.—The retina.
   (a) The innermost cells of the whole embryonic retina.
   (b) The innermost cells of the pars ciliaris retinae only.
   (c) Proliferation of Muller's cells or neuroglia tissue.

2.—The basal cells or cones of the primordial lens.

DISCUSSION OF THE HISTOLOGIC FINDINGS

It has been stated above that three varieties of vitreous fibres, distinguished according to their position and morphology, were found. In what way do they conform to the types as advanced in the theories reviewed above?

1.—The first variety consists of the protoplasmic connecting fibrillae found between folds of transitional retina in the region of the ora serrata. These indicate what probably takes place throughout the course of the whole retina in its early embryological state before a differentiation of the cells into special layers has occurred, and before the retinal cells are finally closed off from the vitreous chamber by a cuticulum, the internal limiting membrane of the retina. In very early embryos exactly the same form of protoplasmic fibrillae are seen coming from the basal cells of the primordial lens before there is any evidence of a cuticulum which later becomes the lens capsule. Inasmuch as the differentiation of retinal cells and the retinal cuticular formation begins posteriorly and gradually extends forward towards the ora serrata as the eyeball grows, it would be natural to expect any remnant of early vitreous to be found where transitional retina still existed. Further, as this early vitreous is seen only in connection with undifferentiated or embryonic retinal or lenticular cells, it must be concluded that it has only a comparatively brief existence. The object of its existence seems concretely stated in a term given by von Szily, viz., embryonal supporting tissue. This term implies constructive aid to the proper formation and growth of the eyeball. It could also imply its use as a support or framework for the hyaloid vascular system which begins during the seventh week of fetal life. This system, however, quickly outgrows its supports which, having fulfilled their chief function, disappear. The first variety of vitreous fibres therefore is the mass of typical protoplasmic connecting processes from the nuclear-free or marginal zone of the inner layer of the secondary optic vesicle, and as such it conforms to the theory of an ectodermal origin from the innermost cells of the whole embryonic retina. Their existence then is only transitory.
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2.—The second variety consists of fibres originating from the pars ciliaris retinae. Normally these fibres radiate throughout the whole chamber, but in this case the third variety so dominate the space that their course is restricted to a very narrow area at the periphery where they lie close against or parallel to the internal limiting membrane of the retina. They cannot be considered as a proliferation of Muller's cells because the embryonic condition of that area of the inner layer of the optic cup does not warrant such a differentiation. In fact the term "neuroglia vitreous" as used by Magitot and Maw as certainly is to be questioned, because the formation of a cuticulum which is called the internal limiting membrane of the retina has begun before we can definitely differentiate Muller's cells. The second variety therefore does not warrant any other ectodermal origin than from the cells of the pars ciliaris retinae.

3.—The third variety of fibre, which is the predominating type, comprises that mass of fibres which certainly appears to come from no other source than from the cells of the fibro-vascular sheath of the lens. This sheath is definitely to be considered as a connective tissue structure because of its positive staining reaction by Van Gieson's method. Also because of the presence throughout the sheath of numerous elastic tissue fibres. That this variety of vitreous fibres is not merely a cuticular product is shown by the fact that a number of fibres themselves are nucleated and morphologically are greatly elongated spindle cells. The normal eye presents nothing comparable in its embryologic history to the coarseness of these fibres. Their existence indicates very clearly a participation on the part of the normal hyaloid vascular system in the formation of a vitreous structure. It differs from the normal eye in that the growth of the definitive vitreous fibres from the pars ciliaris retinae has largely been inhibited because of the markedly normal increase, both in size and probably in number, of the connective tissue or mesodermal vitreous fibres which, pari passu with the persistence of the hyaloid vascular system and the proliferation of its connective tissue element, continued their non-arrested development. That these fibres originate entirely from a structure which is known in normal cases completely to disappear between the eighth and ninth month of fetal life is evidence that their existence also must be transitory. The third variety of vitreous fibres therefore represent a mesodermal origin from the hyaloid vascular system.

The specimen presented, therefore, supports the theory of the mixed origin of the vitreous. It presents two forms of ectodermal vitreous, both derived from retinal cells. It most vividly demonstrates
a connective tissue or mesodermal vitreous, about which there has been so much dispute for several decades.

Based upon the histologic findings in this case and the histology of the eye in the normal embryo, I suggest the following chronologic and genetic classification of the vitreous of the human eye:

1.—A transitory ectodermal vitreous originating from the innermost cells of the primitive retina and from the basal cones of the primordial lens.

2.—A transitory mesodermal vitreous originating from the connective tissue cells that enter with or proliferate from the hyaloid vascular system.

3.—A definitive or permanent ectodermal vitreous originating from the cells of the pars ciliaris retinae.

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v. Graefe's Arch. f. Ophth., 1907, Bd. lxv., Heft 2, S. 249.
There are five muscles of the soft palate as follows: the levator veli palatini, the tensor veli palatini, the glosso-palatinus, the m. uvulae and the pharyngo-palatinus. As you already know, the innervation of most of these muscles is quite well understood, so I will speak only about the innervation of two, namely: the levator veli palatini and the m. uvulae. Many people have made a close study of the innervation of these muscles but as yet it is not fully understood, and opinion is divided. After investigating the theories held by many scientists, and studying the handbooks and various textbooks, I find that formerly the general opinion was that these muscles are innervated by the facial nerve. This opinion was advocated chiefly by the older anatomists who held that the motor fibres of these muscles came from the nn. palatini, which are branches of the 2nd division or the maxillary nerve of the trigeminal nerve. But these fibres do not come from the main root, however; they come through the greater superficial petrosal nerve which is divided in the geniculate ganglion, as a branch of the facial nerve, and connects this with the sphenopalatine ganglion of the trigeminal nerve.

A later opinion, formed chiefly as a result of physiological experiments, is that these motor fibres come from the pharyngeal plexus which is composed of the pharyngeal branches of two nerves, namely: the vagus nerve and the glossopharyngeal nerve, and this opinion is still held by some American and English authors. For instance, you will find in the 5th edition of Morris' Human Anatomy, that both muscles in question, the levator veli palatini and the m. uvulae, are said to be supplied by the pharyngeal branches of the vagus nerve. The 20th edition of Gray's Anatomy in giving the nerve supply of the muscles of the palate states that "the tensor veli palatini is supplied by a branch from the otic ganglion; the remaining muscles of this group are in all probability supplied by the accessory nerve through the pharyngeal plexus." You will find a similar statement in the 4th edition of Cunningham's textbook, namely: "the muscles of the soft palate (except the tensor veli palatini, which is innervated through the otic ganglion by the trigeminal nerve) are supplied through the pharyngeal plexus by the accessory nerve."
Innervation of the Soft Palate.

When we consider the former opinion, advocated chiefly by the anatomists, it seems strange that when both muscles are innervated by a branch of the maxillary nerve that the motor fibres should not come from the root of this nerve but from a connection branch, i.e., the greater superficial petrosal nerve, the connecting branch between the facial and trigeminal nerves. This opinion seems to have been advocated as a result of a few cases observed by clinical physicians. They noticed that whenever there was an injury of the facial nerve above the geniculate ganglion, the result was a paralysis of the soft palate and, therefore, concluded that the innervation came from the facial nerve.

Besides the two opinions which I have just spoken about, there is also a third theory as to the innervation of these two muscles which seems, as it were, to combine the two in one. According to this theory the muscles are innervated from the front by the facial nerve and also from the back by the pharyngeal plexus. However, I think this theory has not been based upon detailed research but merely rests on former opinions.

It is an especially difficult problem when we try to investigate the m. uvulae, as this muscle is very small and the nerve is accordingly also fine. Therefore, it is very difficult to ascertain the real relation between the muscle and innervating nerve satisfactorily by means of physiological and anatomical research. The recent inclination of general opinion is that the nerve supply of the m. uvulae is not clearly understood. For instance, the German anatomists MERKEL and RAUBER-KOPSCH, have written in their books that the innervation of these muscles is not clear.

I have told you the present state of our problem and now I will tell you the result of my own research upon this subject. I have employed for this purpose, besides the customary methods of anatomical and physiological research, another method, one as yet seldom used in this connection, namely, the embryological and comparative anatomical method.

The anatomical method which I used is as follows: I have dissected the heads of about thirty human bodies and looked for the nerve which enters the soft palate and followed the branch of the 2nd division of the trigeminus from the sphenopalatine ganglion into the soft palate. I found that the n. palatinus medius enters the levator veli palatini and approaches near the m. uvulae. The first opinion which I mentioned was probably based upon this discovery.

It is very difficult to say whether the fibres connect with the muscles or not by using only the anatomical method; the best way to
find this connection is by microscopical research. But with such a large object as the palate of an adult, even after making the necessary microscopical series of the sections, it was very difficult to follow the nerve from one section to another. So the connection of the nerve with the muscles can only be confirmed by other methods which we will discuss later.

I have also examined, using the anatomical method, to see if some branch of the pharyngeal plexus comes to our muscle, as it is very clear that several branches enter into the m. pharyngopalatinus and mm. constrictoris pharyngis and supplies them. In two cases only I followed the nerve quite near to the levator veli palatini, but the nerve being very fine I finally cut the fibres to be able to follow them into the muscle. I have never discovered the branches which supply the m. uvulae.

By comparative embryological research I have examined a series of sections of the mole-embryo and found that the fibres of the nn. palatini, coming from the 2nd division of the trigeminus, supply only the mucous membrane and do not supply the levator veli palatini. This muscle is innervated by the glossopharyngeal nerve. However, I am not sure whether the fibres come directly from the root, or if they are branches coming from the nervus vagus and enter the glossopharyngeal nerve and through it enter into the muscle to supply it. The mole has no m. uvulae.

My physiological experiments were made upon five monkeys, one from Japan and four from Formosa, and consisted of electrical irritation of the nerves mentioned, but I was able to add very little to former observations. I found no reaction of this muscle by an irritation of the facial nerve.

When I irritated the vagus and the glossopharyngeus at the same time, the soft palate moved. By this movement it seemed to me as if not only the pharyngopalatinus but also the levator veli palatini moved convulsively at the same time. I am not able to state whether the m. uvulae moved at the same time or not.

In my physiological experiments it was remarkable after irritation of the root of the trigeminal nerve of the five monkeys, that only in one case did the soft palate move, and this movement was too extensive to prove that only the m. uvulae answered to the irritation. It is also probable that any motor fibre from the trigeminal nerve coming to the soft palate must come, not through the greater superficial petrosal nerve, but from the root of the trigeminal nerve. As we shall see later, not only the m. uvulae but probably other muscles of the soft palate moved at this irritation.
The embryological research upon which I have placed most stress is as follows: I made a series of sections of the soft palate taken from the human embryo at the 5th and 6th month of development. At first I searched for and found the peripheral end of this nerve in the muscle, as you see for example on this chart, and followed it centripetally from one section to another section and so on, along its direct course toward the trunk, and thus determined the origin of this fibre. This method of research is very troublesome and hard to manipulate, because in examining the numerous sections of the series we sometimes miss the right connections of the nerve, or accidentally change and follow the branch of a different nerve which may happen to pass near our nerve. So close attention and great patience is very necessary in the examination of such a series. To avoid the mistakes which I have just mentioned, and to prove the correctness of my observations, I repeated the same manipulation several times in spite of its difficulty. So I found a branch of a nerve, as you will see marked here on the chart, in the middle of the m. uvulae, and I found by following this branch the continuation passed not backward to the pharyngeal plexus but forward to the foramen palatinum majus. This branch is doubtless the n. palatinus posterior coming from the trigeminal nerve. I searched carefully to see if any branch of the nerve passed backward from this muscle to the pharyngeal plexus but I found none, so I can positively say that the m. uvulae is supplied only by a branch of the 2nd division of the trigeminal plexus. I am not certain, whether the n. palatinus posterior innervates the levator veli palatini at the same time or not. I found many branches of the n. palatinus posterior among the fibres of the levator veli palatini, but I was not able to decide, because of the bad fixation of the embryo which was not fresh, whether the fibres only perforated the muscles in order to supply the m. uvulae and the mucous membranes of the upper surface of the soft palate, or whether it also entered into the levator veli palatini and supplied it. I think perhaps it is possible that the levator veli palatini receives some branches from the trigeminal nerve, since we have seen by the physiological experiments that the movements caused by the irritation were too widely extended to be a movement of the m. uvulae only.

On the other hand, it is quite evident that some branches enter the levator veli palatini in several places and supply this muscle. You can see here on the chart that one branch comes to the muscle, so it is no doubt clear to all of you, that the levator veli palatini is innervated by the pharyngeal plexus.

When I compared my observations obtained by the anatomical, and comparative anatomical methods, embryological research, and
physiological experiments. I found the results almost all agreed perfectly. So I can make a resume of my observations as follows:

1.—The m. uvulae is supplied by the n. palatinus posterior which is a branch of the 2nd division of the trigeminal nerve.

2.—The levator veli palatini is innervated by the pharyngeal plexus, and probably also by a branch of the n. palatinus posterior, sometimes also by the n. palatinus medius.

Then there is one question still unsolved: namely, where do the motor fibres come from which are contained in the nn. palatini? Do they come from the greater superficial petrosal nerve of the facial nerve as scientists have formerly maintained? I do not think so. I think perhaps the motor fibres pass in another way and enter into the nn. palatini to supply our muscle. That is, they are derived from the root of the trigeminal nerve and I reach this conclusion from the following facts.

1.—My physiological experiments have shown (though only in the case of one monkey out of the five experimented on) that the soft palate moved at the irritation of the trigeminal nerve.

2.—Prof. Ozawa, one of my teachers, suffered a stroke of apoplexy, the lesion being in the pons. This caused hemiplegia alternans: namely, on the right side of his body a disturbance of sensibility and muscular movement was diminished a little; while on the left side there was a slight paralysis of the facial nerve. The disturbance of the sensibility of the face was a result, of course, of the paralysis of the trigeminal nerve. It seems, however, that only the 1st and 2nd divisions of it were affected; the 3rd division, which is said to contain only the motor fibres of the trigeminal nerve, seemed to be unaffected. There was a slight paralysis on the same side of the soft palate and as a consequence he had a little trouble in deglutition. All the organs supplied by the vagus nerve and the glossopharyngeal nerve, therefore also by the pharyngeal plexus, were not affected. Now he has recovered almost entirely from his illness, but the disturbance of the sensibility of the body and the paralysis of the soft palate have not entirely left him, although the paralysis of the facial nerve disappeared some time ago. When I considered that the paralysis of the trigeminal nerve was not on the same side as the facial nerve
affected, and since the two former symptoms both remain in the face, I conclude that probably some motor fibres of the trigeminal nerve pass not only through the 3rd division, a theory already accepted, but also through the 2nd division to the soft palate and they do not come from the facial nerve. Perhaps the sensory and motor fibres of the 2nd division of the trigeminal nerve, coming from the brain pass in the pons very close together and were probably injured by the stroke of apoplexy at some place where these nerves pass with the facial nerve and the remaining sensory nerves of the body, but at this point the facial nerves have already crossed but the other two have not yet crossed.

I carefully separated the n. palatinus posterior from the remaining portion of the n. palatini and followed it, though only once, through the sphenopalatine ganglion into the trunk of the 2nd division of the trigeminal nerve; therefore the motor fibres of the nn. palatini come from the 2nd division of the trigeminal nerve, pass through the sphenopalatine ganglion and supply the soft palate. More than that, clinical physicians have also said recently that the soft palate is not affected by a paralysis of the facial nerve.
CONCERNING ANTHROPOMETRY AND OBSERVATIONS ON HEALTHY SUBJECTS.

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It has long been recognized that standardization of method as well as accuracy of observation is of vital importance in any anthropometric work. To be of the highest scientific value, measurements must be taken with care and by a standard method internationally recognized and universally used. At the present time though much yet remains to be done, many measurements both on the living subject and on skeletal material have received international sanction and become standardized.*

Many such measurements require the use of instruments of special manufacture which are at present impossible to obtain on the market. On the other hand, not a few valuable measurements can be made with accuracy and according to international standard by the aid of relatively simple and inexpensive instruments. It is the purpose of this short note to draw attention to measurements of considerable value which can be made with instruments available in China, and also to certain physiological observations which it is highly desirable to have recorded for each subject examined.

As a preliminary step in any observation the following important data should be recorded: sex of subject; place of birth (province) and date of birth (according to European calendar.) Students of all school grades should be encouraged to ascertain and remember the day, month and year of their birth, and all records should be accompanied by these data. It seems hardly necessary to add that the date of examination of the subject should always be recorded.

As an example of the necessity of having accurate age records it is only necessary to remind the reader that the dates of eruption of teeth among the Chinese are not the same as among Europeans. This much is known, but beyond the very general statement little can be said, for detailed information is lacking and can only be supplied by observations carried out on children and young adults of known age.

*For a detailed account of the history and present status of the international standards of anthropometry reference should be had to the articles on anthropometry by Dr. Ales Hrdlicka in the American Journal of Physical Anthropology, volumes I and II.
In connection with physiological observations on healthy subjects the time of day when the records are made is of importance and should be recorded; also a note should be made on the general state of health as evidenced by the condition of the subject's tongue. The pulse, respiration and sublingual temperature should be recorded. The pulse should be examined with the subject sitting quietly at rest, and the same rule applies to observations on respiration and temperature.

The value of such physiological observations becomes evident when it is recalled that pulse, respiration and temperature are characters that may show distinct racial variations. The truth of this has been established repeatedly by Hrdlicka, who has shown that the slower pulse and lower temperature of the North American Indian, as compared with whites, is a true racial character appearing early in life and strong enough to persist under changing conditions. (Vide Bull. Am. Ethnol., No. 34, 1908.) On the other hand, the same investigator has demonstrated that the perceptibly faster pulse and respiration and the lower temperature of the natives of the Kharga Oasis in Egypt as compared with Europeans is not a racial character, but one attributable in the main to the immediate environment and in all probability largely remediable. (Vide Smithson, Misc. Coll., vol. 59, No. 1, 1912.)

With regard to the actual anthropometry, it is a well known law that in the determination of any mean the probable error diminishes not in the same ratio as the number of individuals measured but as to the square root of the number. In order to obtain information concerning racial characters which will closely approximate the truth, a very large series of similar observations on different individuals must be made. Since most of the observers who will care to undertake this work will have to do so in addition to their other strenuous duties, it is manifestly best at the outset to restrict the field of observation to a few easily taken standardized measurements and to carry out these measurements on as large a number of subjects as possible, including those of both sexes and all ages. All measurements are of course to be made in the metric system.*

*A further and most convincing argument against a more extended programme of anthropometry at present is the lack of special instruments for taking measurements. Within the course of the next year, however, sets of standard anthropological compasses should again be available on the market. At present they may be had only on special order at a cost of about Mex. $130.00 and delivery cannot be guaranteed under ten months. It is hoped that by June 1st, 1920, standard paper anthropometric planes such as described in the appended extracts from Dr. Hrdlicka's article (q.e.d.) will be ready, for distribution from this laboratory at a nominal price. The writer will be glad to give further information to any who may be interested, and later to make arrangements for instruction in the use of special anthropological instruments.
The measurements recommended both on account of the simplicity and accuracy with which they may be taken and of their anthropological value are as follows: stature, sitting height, span and weight. In view of the detailed description below no further remarks are necessary with reference to the first three of these measurements.

With regard to weight, it has been the practice in the Division of Physical Anthropology of the U. S. National Museum to weigh subjects in ordinary clothing and shoes but without coats or hat. In the Army and in the gymnasium, however, the weight is usually taken in the absence of clothing. In China the amount of clothing worn by the subject at the time of weighing may be somewhat difficult to regulate since it varies so much with the seasons. Certainly the shoes should not be worn and all heavy over-clothing should be removed, but no hard and fast rule can be laid down in this procedure. Until some definite routine has been established it is desirable that a note on each record should be made as to the amount of clothing worn at the time of weighing.

The following extracts have been taken from an article entitled, "Anthropometry—C. Anthropometry on the Living," by Dr. Ales Hrdlicka, from the American Journal of Physical Anthropology, Vol. 2. No. 3. 1910. They require no further comment.

"1. The Anthropometric Plane of Broca. Made of thoroughly seasoned wood, 1 meter high, 12.5 cm. broad, 1.5 cm. in thickness, stained dull yellow, varnished; graduated in centimeters full across, in half-centimeters one-half or two-thirds across, and in millimeters along the left or both margins. Marking plain, easily legible. The upper edge provided with two eye-screws or other device for hanging; and the plane may be hinged at the 70 or 75 cm. mark for easier transportation (A. H.). 1a. Square (adjunct).—Two pieces of light wood, 18 cm. long by 12 broad by 1.2 in thickness, joined at right angles, and provided on the inside, in the middle line, with a narrow strip, serving as a handle; stained and varnished as 1.

"Use: for measuring stature and sitting height. In the laboratory it is of some advantage to use a separate plane for each of the two measurements, the plane for measuring stature being fastened one meter above the floor, while that for measuring sitting height is fastened directly above the bench on which the subject sits for this measurement. In the field, one plane fastened one meter above the floor or a level piece of ground, will do for both measurements, the height of the bench in the case of sitting height being subtracted from the total measurement obtained."
"Paper or Cloth Plane or Tape. At the occasion of certain recommendations made by the Committee on Anthropology of the National Research Council, in connection with the impending measuring of large numbers of recruits for the United States Army, the writer proposed that instead of the more costly plane, special inextensible linen or paper strips be printed to take its place. A strip of this nature, 8 to 10 cm. broad, printed accurately on inextensible and unshrinkable paper or other material (ordinary materials change considerably), is easy to work with and has the advantage of cheapness as well as ease of transportation. They may be made in segments of 50 cm. In cases of necessity a scale may be improvised on the wall or other vertical, or on a strip of paper; or the ordinary anthropometric tape may be fastened to the wall, rod, etc. An improvised paper scale should be well varnished on both sides, to prevent puckering.

"2.—Wooden Bench (accessory). For measuring height sitting (and other purposes). For laboratory use and in measurements on American people (who on the average are tallest of all whites) the most serviceable bench is one of 50 cm. in height, 50 cm. in breadth, and 82 cm. anteroposteriorly. For work among shorter peoples, and especially among children, the bench must be lower, the aim being for the thighs of the subject to be flexed at right angles to the trunk. In the field, any convenient well-made box may be used.

"3.—Measurements of the Body: Stature. The stature is to be measured by the anthropometric plane of Broca, or an equivalent strip or tape (see under Instruments), with a square. The subject stands erect, on level surface, with heels together, and with these, the buttocks and the shoulders applied to the vertical (wall, rod, tree, etc.) on which is fastened the anthropometric plane, while the head is held so that the visual, as well as the biauricular axis is horizontal. The occiput will frequently touch the vertical in this position, but it is not obligatory that it should do so. The arms hang in natural position. The height of the vertex is ascertained by means of the square. Observer stands slightly to the left of the subject, manipulates the square by holding it lightly in the left hand, and reads the measurement on the right margin of the plane. The square is applied to the head horizontally, twice or three times in succession to facilitate correct reading, and with sufficient impact to feel the skull resistance. Care must be exercised not to make an error in the reading.

"The method as given here differs slightly from the Geneva agreement in that it provides, through the application of the heels,
buttocks, and shoulders to the vertical, of a strictly standardized posture which will also serve for other measurements. There is no appreciable difference in the measurement by the two methods if taken with sufficient care; but the modification here given assures a greater uniformity of results as well as a greater ease of procedure. It is moreover strictly speaking the method of Broca; and it is the method of the Geneva International Agreement for sitting height (q.v.). It is incongruous to take the total height in one standard position and the sitting height in another.

"Should the development of the buttocks interfere, as may occasionally happen in women, the subject is not forced against the vertical, but allowed to stand slightly in front of the same.

"4.—Span. The horizontal distance from tip of medius to the tip of medius, in maximum extension of the arms. Instruments: a vertical moulding (or wall) against which to apply one of the fingers, and a broad horizontal scale on which to take the measurement (see under "Instruments"). Method: the subject whose stature and perhaps also sternal or shoulder height have just been measured, extends one of his arms horizontally until the medius is applied to the provided vertical, and raises the other arm into a similarly horizontal position. The observer applies his thumb nail to the medius of the free arm, and watching the subject, as well as the continued application of the medius of the arm first raised to the vertical, he directs him or her to expand the arms as much as possible. As the expansion takes place the thumb of the observer is pushed along the scale, until the maximum is reached. That the latter has been reached can usually be told from the attitude and expression of the subject. The arms are then dropped and the measurement indicated by the nail of the observer’s thumb as read on the scale. The whole procedure is quite simple. Normality of the parts entering into the measurement is of course essential.

"5.—Horizontal Plane (accessory). For laboratory purposes and for field work where numerous subjects are to be measured, this is a useful accessory facilitating the measurement of the span. It consists of a light wooden plank, or paper strip, 30 cm. in length, graduated from 140 to 200 cm. For the purposes of measuring the span a vertical wooden strip is fastened on the wall 80 cm. from the parallel with the left edge of the vertical plane, to serve as a "point d’appui" of the longest finger of the right hand of the subject. The horizontal plane is then fastened to the wall at a distance of 140 cm. from this vertical strip (or 47.5 cm. to the right of the vertical plane), and serves for the determination of the span length,
the exact manner of taking which will be described under "Methods." A serviceable scale of this nature may be improvised on the wall. A paper scale must be well varnished.

‘6.—Sitting Height. The Geneva Agreement stipulates as follows: ‘Sitting height.—The subject sits on a horizontal and resisting seat about 30 to 40 cm. high (this height being proportionate to the stature of the subject): the knees are flexed; the dorsal aspect of the trunk is to make contact with a vertical plane, or with the anthropometric rod at two points, viz., in the sacral region and again between the shoulder blades. The axis of vision is horizontal. The height of the vertex above the surface of the seat is to be measured.’

‘The directions here given need no alteration. The height of the bench for American adults, whose average stature is superior to that of most other whites, should not be lower than 45, and may conveniently be 50 cm. (see under ‘Instruments’). In taking the measurement, special care must be taken in each case that the sacral region be well applied to the vertical. The occiput in this position generally touches the vertical plane.’

It is hoped that these suggestions may be of use to the profession and to others interested in the subject of Physical Anthropology in China.