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Fig. 1



Fig. 2

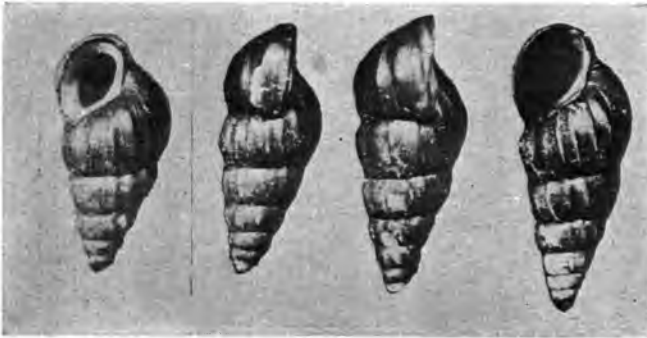


Fig. 3a



Fig. 3b

Intermediate Host of *Schistosoma japonicum* in China :  
Its discovery in region of Soochow (Meleney and Faust).

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**THE INTERMEDIATE HOST OF *SCHISTOSOMA JAPONICUM* IN CHINA.**

**I. ITS DISCOVERY IN THE SOOCHOW REGION.\***

By HENRY EDMUND MELENEY, M.D., Department of Medicine,  
and

ERNEST CARROLL FAUST, Ph. D., Department of Pathology,  
Peking Union Medical College, Peking.

Although schistosomiasis japonica was recognized in China soon after the discovery of the parasite in Japan by Katsurada (1904), and although the disease is one of the most important parasitic infections in Central China, very little progress has yet been made toward its eradication. The intermediate host of *Schistosoma japonicum* has been known in Japan since 1913, when Miyairi and Suzuki (1914) found it to be the snail, *Blanfordia nosophora*. In China the intermediate host was searched for by Leiper and Atkinson in 1914, but their search was cut short by the outbreak of the Great War and was unsuccessful (Leiper and Atkinson, 1915). Since that time no systematic search for the host has been made in China as far as we know. Realizing that the recognition of the intermediate host was a prerequisite to any intelligent effort to rid China of this disease, we determined to search in an endemic region for the responsible snail.

We chose for our search the endemic region about Soochow, and received the hearty co-operation of Dr. John A. Snell and the staff of the Soochow Hospital, as well as that of Dr. M. P. Young of the Elizabeth Blake Memorial Hospital. On August 11, 1922, we were conducted by Dr. Snell to a region north of Soochow from which cases of schistosomiasis were known to have come. After a few hours' search we found a man with the typical distended abdomen

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\*Contribution from the Parasitology Laboratory, Department of Pathology, Peking Union Medical College.

of the late stage of the disease, and by fecal examination found that both he and several other persons who lived near him on the shore of a small terminal canal were discharging ova of *Schistosoma japonicum* in their feces. A brief search along the shore of this canal revealed the presence, in large numbers, of a small acuminate snail very similar in appearance and habits to the Japanese intermediate host.

We collected several hundred of these snails, and, on returning to the laboratory, crushed them and found that five per cent were infected with cercariae morphologically similar to that of *Schistosoma japonicum* (Fig. 1). We therefore immersed several black-and-white mice in water containing these cercariae, and at intervals of fourteen, twenty-one and thirty-one days thereafter, sacrificed them and found in their portal and mesenteric veins typical specimens of *Schistosoma japonicum* corresponding accurately to the stages of maturity which should be found at such intervals after infection (Fig. 2).

We also exposed a large number of these snails to miracidia of *Schistosoma japonicum* hatched out from ova found in the feces of clinical cases of the disease. The miracidia vigorously attacked these snails, a phenomenon which could be readily observed through a binocular dissecting microscope. Other species of snail from the same region similarly exposed were attacked by a few miracidia, but not as vigorously as was the snail which had harbored the *Schistosoma japonicum* cercaria. The exposed snails of all species were killed at various intervals after exposure and serial microscopic sections were made of them to determine whether the miracidia had succeeded in penetrating the snail and in developing into the cercaria form. Miracidia and developing forms were found only in the snail which had already been found to act as host. In this snail the intra-molluscan development of the parasite was clearly followed at weekly intervals through the primary and secondary sporocyst stages to the adult cercaria form, which latter was found on the seventy-second day after infection. On this day two of the snails infected in the laboratory were used to infect a mouse. This mouse died seventy days later and adult specimens of *Schistosoma japonicum* were recovered from its portal veins.

The snail which we found to be the intermediate host of *Schistosoma japonicum* is a small operculate gastropod with an

acuminate shell measuring 4 to 9 millimeters in length by 2 to 4 millimeters in breadth. The coil of the shell is dextral and consists of seven spirals. The terminal spire is often eroded. The lip of the shell, the so-called peristome, presents, when complete, a prominent varicose concavity, beyond which the edge of the shell terminates in a slight constriction. This feature, however, is often absent. The shell itself is faintly translucent or opaque, and varies in color from dark brown to straw-color. It is moderately hard, requiring considerable force to crush it. The shell is usually clean, but may be discolored green with algal growth or white with lime deposit. Unlike *Blanfordia nosophora*, the shell of this snail is traversed at regular intervals by prominent ridges or costules, running at a right angle to the spiral groove of the shell and therefore parallel to the lip.

We do not feel competent to classify or to name this snail and have therefore sent specimens to Mr. Bryant Walker of Detroit for this purpose. Pending his report, however, we can state that this snail apparently belongs to the genus which was named by Heude, *Hemibia*, because of its habit of living both within and outside of the water. Several species of this snail are described by him in his excellent work on the Molluscs of the Yangtze Valley (Heude, 1890). We have seen specimens of his snails in the Zi-Ka-Wei museum in Shanghai and are convinced that we are now dealing with this same genus.\*

The only snail with which the true intermediate host of *Schistosoma japonicum* can be easily confused is a member of the genus *Melania*, probably *Melania cancellata*, whose smallest forms are about the same size as the largest forms of Heude's *Hemibia*. *Melania*, however, lives only beneath the surface of the water, its shell is much harder than that of *Hemibia*, and the vertical ridges are more prominent and farther apart.

We shall defer until a later paper, a detailed discussion of the habitat of the intermediate host of *Schistosoma japonicum*. It will suffice to say here, that the snail was found, in the Soochow region, principally on the shores of secondary or terminal canals, which

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\*Since this paper was submitted for publication, Mr. Bryant Walker has identified this snail as *Oncomelania hupensis* (Gredler). The name *Hemibia* was erroneously introduced by Heude and is an exact synonym for *Oncomelania*.

contain clear, cool, relatively still, fresh water. It is most abundant within a few inches of the water's edge, and more abundant out of the water than in it.

We examined also in Soochow snails belonging to seven other genera but failed to find in any of them the cercariae of *Schistosoma japonicum*.

In order to establish the biological identity of the forms of *Schistosoma japonicum* found in Soochow with those from Japan, we exposed specimens of *Blanfordia nosophora* to miracidia from the ova secured from a Chinese patient; and we also exposed specimens of Heude's *Hemibia*, to miracidia from ova discharged in the feces of a dog infected with material obtained from Japan. In both instances the snails were successfully infected, and serial microscopical sections at various intervals showed the development of the cercaria forms within the snails. The biological identity of the Japanese and Chinese forms of *Schistosoma japonicum* is therefore established.

#### SUMMARY.

1. The mollusk which acts as the intermediate host for *Schistosoma japonicum* in China has not previously been recognised.
2. In the endemic region about Soochow, Kiangsu Province, we discovered the host to be a member of the genus which Heude named *Hemibia*.
3. This snail is very similar in its habits to *Blanfordia nosophora*, the intermediate host of *Schistosoma japonicum* in Japan, but has definite distinguishing physical features.
4. The biological identity of the Chinese and Japanese forms of *Schistosoma japonicum* has been established by infecting Japanese snails with Chinese miracidia and Chinese snails with Japanese miracidia.

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EXPLANATION OF PLATE.

Figure 1. Cercaria of *Schistosoma japonicum* from a specimen of Heude's *Hemibia* found near Soochow.

Figure 2. Male and female adult form of *Schistosoma japonicum* from the portal veins of a mouse, thirty-one days after immersion in water containing cercariae recovered from specimens of Heude's *Hemibia* at Soochow.

Figure 3a. Specimens of Heude's *Hemibia* found in the Soochow region. Magnified x 5.

Figure 3b. The same, life size.

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**THE INTERMEDIATE HOST OF *SCHISTOSOMA JAPONICUM*: II. ITS DISTRIBUTION IN CHINA.\***

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By HENRY EDMUND MELENEY, M.D., DEPARTMENT OF MEDICINE,  
and

ERNEST CARROLL FAUST, Ph. D., Department of Pathology,  
Peking Union Medical College.

In the foregoing article we have described the finding of the snail which acts as the intermediate host for *Schistosoma japonicum* in the region of Soochow (Meleney and Faust, 1923). In anticipation of the definite classification of the snail we expressed our opinion that it belongs to the group which was called by Heude, *Hemibia* (Fig. 1)†. Several species of this genus exist in various parts of the Yangtze Valley (Heude, 1890). The next step in studying this disease in China is to determine the distribution of this genus of snail and of other genera which may act as intermediate hosts for the parasite. We have therefore thought it worth

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\* Contribution from the Parasitology Laboratory, Department of Pathology, Peking Union Medical College, Peking, China.

† Since this paper was submitted for publication Mr. Bryant Walker has identified this snail as *Oncomelania hupensis* (Gredler). The name *Hemibia* was erroneously introduced by Heude and is an exact synonym for *Oncomelania*.



while to emphasize certain points in connection with the habits of the host and the topography of the endemic regions, which may assist in the detection of the intermediate host elsewhere in China. We shall present these points in the following order:—

1. The habitat of the intermediate host in the Soochow region.
2. Possible seasonal variations of its habitat.
3. Possible variations of its habitat in other endemic regions.
4. The existence of the intermediate host in areas not yet endemic for schistosomiasis.
5. Method of determining infection of a snail by the larval stage of *Schistosoma japonicum*.

#### THE HABITAT OF THE INTERMEDIATE HOST IN THE SOOCHOW REGION.

The snail which acts as intermediate host for *Schistosoma japonicum* in the Soochow region lives, as the name *Hemibia* implies, close to the edge of clear, relatively still, fresh water. It is most plentiful on the banks just out of the water, and is almost always within two feet of the water's edge. In the water it is commonly found on stalks of water-grass near the shore, a few inches above or below the surface. It greatly prefers seclusion, and therefore is more plentiful on steep, grass-covered banks, than on flat, exposed shores (Fig. 2). In some places we found it on the sides of stone bridges, particularly in the crevices between blocks of stone.

In the Soochow region the snail was found almost exclusively on the shores of small canals, especially terminal ones (Fig. 3). Here there is very little traffic, and therefore little movement of the water, so that the water is much less turbid than in the large canals which are mainly used for traffic. In small numbers the snails were found in branches of the main traffic canals, sometimes within a few yards of these canals, but never on the main canals themselves.

The examination of the shores of two lakes, Wang Tieh Tang and Chin Chi Hu, southeast of Soochow, failed to reveal snails of this type, although its larger relative, *Melania cancellata* (Fig. 4), which lives beneath the surface of the water, and which in its smaller forms may easily be mistaken for Heude's *Hemibia*, was



Fig. 1a.



Fig. 1b.



Fig. 2.

Intermediate Host of *Schistosoma japonicum* in China :  
 Determination of its Distribution (Meleney and Faust).

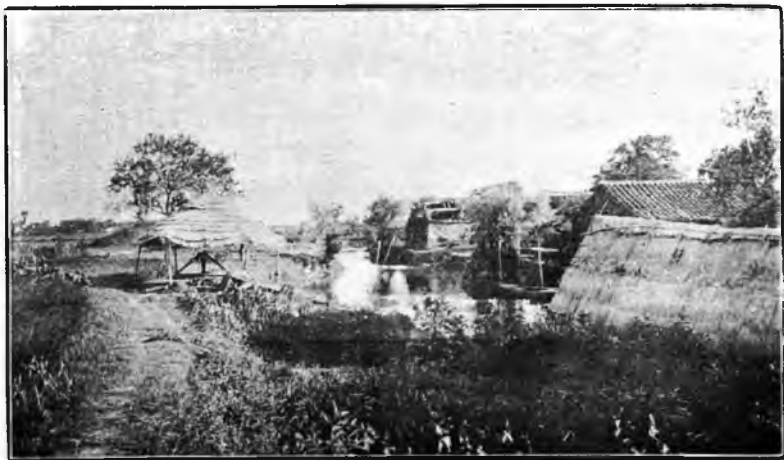


Fig. 3.



Fig. 4.

Intermediate Host of *Schistosoma japonicum* in China :  
Determination of its Distribution (Meleney and Faust).

found there in large numbers. Our opinion is that the almost constant agitation of the water on the unprotected banks of large lakes causes *Hemibia* to avoid these localities because it could easily be washed back into the water when attempting to emerge. This, however, would not preclude the possibility of its existence on the shores of protected coves on these lakes\*. Since the canals about Soochow are fed from lakes, the water of the lakes themselves should not be unsuitable for Heude's *Hemibia*, and we believe that the snail will be found in some canals very close to these lakes. We failed to find it in the limited number of such canals which we had time to examine, but this was possibly because we failed to search in a neighbourhood from which cases of schistosomiasis were known to have come.

It is a matter of special interest that in the Soochow region, we failed, except in one instance, to find the intermediate host of *Schistosoma japonicum* in rice fields. This, however, is easily explained. The level of the rice fields is four to six feet above that of the canals which irrigate them. Therefore, except in very wet seasons, mechanical means are necessary in order to provide the fields with water. We found many rice fields in August with rice one to two feet high, where the ground was dry, caked, and traversed by deep crevices. In winter these same fields are sown to wheat, which means that the fields are relatively dry all winter.

The only place where we found Heude's *Hemibia* at a distance from a canal was in an irrigation ditch which ran between rice fields, leading water into a canal. The source of this water was not determined, but it probably came from a spring near a number of rocky mounds in the center of the area of rice fields. This ditch was over-hung with long grass, and the snails were present in very large numbers. At one place where the ditch led directly into the rice fields we found snails in a field. At all other places they were absent.

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\* It may be that some of the cases reported by Laning (1914) acquired their infection in coves on the border of Tung T'ing Lake. These men probably were not infected by washing the decks or sides of their gunboat at a long distance from the shore. The only way in which infection could be possible in the middle of a large lake would be by the participation as intermediate host of some deep water snail. The tendency of the miracidia of *Schistosoma japonicum* to seek the surface of the water makes it improbable that any deep water snail acts as an intermediate host of this parasite.

Three general principles may therefore be stated at this point : First, that the usual location of this species of snail is neither the dry earth nor the deep water, but the surface of the moist earth close to the water. Second, that in endemic regions where the level of the rice fields is higher than that of the waterways which irrigate them, the intermediate host will usually be found on the shores of those waterways but not in the rice fields. Third, that the less movement there is of the water on the shore of a waterway, the greater is the chance of the intermediate host occurring on that shore.

#### POSSIBLE SEASONAL VARIATIONS OF THE HOST'S HABITAT.

There is evidence to indicate that the habits of this snail vary with the seasons and with other conditions. In cold weather it will not be found at the water's edge. In wet seasons it may invade the rice fields. When very young, and when exercising its generative function, it may also alter its habitat.

Our knowledge of these points so far is very meager, so that we must depend upon investigators in endemic areas for observations on which to base more definite conclusions.

The disappearance of the snail from the water's edge in cold weather has been called to our attention by Dr. K. H. Li\* of Soochow Hospital. Three weeks after having collected for us a thousand specimens of Heude's *Hemibia* in a canal within the city of Soochow, he attempted to make another collection, but found not a single snail where they had been very abundant before. The weather meanwhile had become cold, the thermometer registering as low as 27° F.

In the case of *Blanfordia nosophora*, the intermediate host in Japan, Kobayashi has made the statement that that snail does not bury itself in the mud in winter, but lies free among the dried bushes or on their roots or on clods of earth in a desiccated state. *Blanfordia nosophora* resembles the Chinese intermediate host so closely in its habits, that the latter snail will probably also be found in these locations in winter. Since both these snails possess an operculum, which, when closed, completely seals them up within

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\*Personal communication.

the shell, they can survive desiccation for several weeks at ordinary temperature, and perhaps for months at a temperature just above the freezing point. Cort (1921) records the successful transmission by mail of specimens of *Blanfordia nosophora* from Japan to America. He received the snails twenty-five days after they had been collected in the endemic region in Japan, and eighty-five per cent of them quickly emerged from their shells when immersed in water.

The ability of the snail to migrate from streams to rice fields in wet seasons probably depends upon three factors : first, the height to which the water in the canals rises; second, the duration of the wet weather; and third, the height of the fields above the level of the canals. These factors must, of course, differ in different localities, and careful observations will, therefore, probably yield varying results.

We know of no observations that have been recorded on the life history of this or similar mollusks. A study of the reproduction and of the habits of the young snails may reveal important points in connection with change in the mollusk's habitat. This can be done better in an endemic region than in Peking because of the necessity of utilizing the temperature and humidity variations of the snail's natural habitat. An artificial canal bank in a large aquarium would furnish the proper conditions for these observations.

#### POSSIBLE VARIATIONS OF HABITAT IN OTHER ENDEMIC REGIONS.

In an attempt to determine what variations there may be in the habitat of the intermediate host of *Schistosoma japonicum* in other endemic areas in China, we have questioned persons from these areas in regard to the local topography, and particularly concerning the relation of the rice fields to their sources of irrigation.

We have found a rather wide variation in the topography of the country in different endemic areas. Most are in flat country, but some are in hilly country where the rice fields are nearly all terraced. The source of water-supply varies just as widely. Large rivers, lakes, canals, streams from hills, stagnant ponds and ditches containing rain water are all used. These facts, refer, of course, to comparatively large areas, from some part of which cases of schistosomiasis are known to have come, and it is probable that the actual conditions under which the intermediate host lives are

much less variable than the topography of the country. However, there are a few facts which are of importance, and which may indicate in what portions of each endemic region the intermediate host actually lives.

In the first place all the areas are located in either a river valley, a lake region or a district containing a system of canals. Such regions are always assured of a constant water supply. The point needs no further discussion as the snail requires water for its propagation.

In the second place all the endemic areas contain some rice fields which are irrigated by water which comes, usually by canals, either from permanent lakes or from hill streams. In no case are either large rivers or stagnant, rain-water ponds entirely depended upon for irrigation. This seems to us a very important point, and bears out our observation in the Soochow area that the snail prefers clear water. A consideration of the region about Nanking emphasizes this point. Here the country to the south of the Yangtze River, including the city of Nanking itself, is irrigated either by canals led off from the Yangtze River, or from ponds or ditches which are supplied wholly by rain, and which are pumped dry by the farmers every year. On the north side of the river, however, in Anhwei Province and the western end of Kiangsu, canals leading from hill streams and lakes supply the rice fields with water. Although hospitals in Nanking have cases of schistosomiasis, practically all of them come from the north side of the river, while the south side is almost entirely free from the disease.

As a result of these observations we believe that it will be found that the presence of a snail which may act as the intermediate host of *Schistosoma japonicum* depends more upon certain simple principles relating to its habits than upon the general topography of the country in which its existence is suspected. We believe that it may be found in rice fields only if the fields are near enough to the level of their water supply to be almost constantly moist; that it may be found in ponds if they are practically perennial and if their water is kept from becoming stagnant by sufficient rain and by fish, mollusks, or other plankton life; that it may be found on the shores of streams which are clear, if the

movement of their water is very slow;\* but that in all areas where it exists, *the small canal or irrigation ditch is the ideal place in which to find the intermediate host of Schistosoma japonicum.*

THE PRESENCE OF THE INTERMEDIATE HOST IN AREAS NOT YET  
ENDEMIC FOR SCHISTOSOMIASIS.

The question as to whether the parasite, *Schistosoma japonicum*, is now present wherever its possible intermediate hosts exist is one of great importance. If the host has a wider distribution than the parasite, it is of potential danger to a population not yet infected with schistosomiasis, and should be eradicated in order to prevent the spread of the disease. In some places about Soochow where Heude's *Hemibia* was very abundant, we could find no cercariae of *Schistosoma japonicum* in examining several hundred snails, although we succeeded in infecting snails from these localities in the laboratory. Reports from Kashing also suggest that the disease is now present in villages which a few years ago were free from it. Furthermore, in answer to questionnaires sent out to physicians in all the probable endemic regions of China, we have secured positive reports from regions hitherto not generally known to have been infected. Some of these positive reports are undoubtedly due to improvement in laboratory methods in the hospitals concerned, but in other cases the infection may be a recent acquisition to the region. We therefore wish to urge physicians who are interested in working out the exact extent of schistosomiasis in China, not only to search for the intermediate host in their own regions, but to solicit the co-operation of physicians in other areas where the topography and climate are favorable for the existence of such a snail.

METHOD FOR DETERMINING INFECTION OF A SNAIL BY  
*Schistosoma japonicum.*

The equipment necessary for determining whether or not a snail is infected with *Schistosoma japonicum* consists of a microscope, a shallow glass container thick enough to stand the pressure required

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\*Since this paper was submitted for publication, one of us (F. C. F.) has found specimens of a species of *Blanfordia* on the banks of hill streams near Shaohsing, Chekiang Province. It is therefore probable that this genus of snail also acts as intermediate host for *Schistosoma japonicum* in some of the endemic regions in China.



to crush the snail's shell, a pair of forceps for collecting and handling the snails, and a disinfectant, preferably formalin. Care should be taken not to let one's skin come into contact with water or containers in which the suspected intermediate host is found. If this occurs, the exposed part should be quickly washed with a disinfectant. The snails are collected with forceps and placed in a dry container, thus avoiding the possibility of their discharging cercariae during collection. In the laboratory they should be kept either in the dry state, in moist earth, or in a covered glass jar or dish containing soft water to a depth of a few inches. For examination the snails should be placed, one at a time, in a small flat glass dish with a few drops of soft water. The shell should be crushed and the snail macerated slightly by firm pressure with some hard flat object such as the bottom of a small bottle. The mature sporocysts of *Schistosoma japonicum* usually occupy the lymph spaces of the liver of the snail, which is the organ farthest within the shell. When the snail is macerated the sporocysts burst, liberating their cercariae, which can be seen under a very low power of the microscope (10 to 50 magnification). They swarm in great numbers in the water. All fork-tailed cercariae have a similar movement, either progressing forward by the use of oral and ventral sucker, or progressing backward by a whip-like motion of the tail, or "pivoting" about the ventral sucker.

Since the intermediate host of *Schistosoma japonicum* may also act as host for other fork-tailed cercariae, a diagnosis of the cercaria found must depend upon either an accurate study of the morphology of the cercaria (Faust and Meleney, 1923) or upon the ability to produce adult forms of *Schistosoma japonicum* in mice or other experimental animals. This latter method is the one which Leiper (1915) advocated for the identification of all schistosome cercariae (p. 39).†

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† The writers are anxious to co-operate with any investigators who are interested in determining whether the intermediate host of *Schistosoma japonicum* exists in their neighborhood. We shall be glad to receive specimens of live snails sent in dry wooden boxes, or of cercariae obtained from such snails, together with the crushed snails, fixed in 10 per cent formalin and sent in small glass bottles. All specimens should be carefully labelled with the exact locality from which they were collected, date of collection and name of collector. Specimens should be sent by parcel post registered, and addressed to Dr. Henry E. Meleney, Parasitology Laboratory, Peking Union Medical College, Peking.

The true intermediate host of *Schistosoma japonicum* may be infected by the parasite in percentages anywhere up to fifty or above. On the other hand, several hundred specimens of the host may be examined without finding one infected. The average infection of the snails in actively endemic areas in summer is commonly from one to ten per cent. In planning a search for the intermediate host the most simple procedure is to locate first the home of an active, preferably recently infected, case of schistosomiasis, next to ascertain the presence of other cases in the immediate neighborhood, and then to examine the shore of a body of clear, relatively still water situated near the habitations of these people. A snail of form and habits similar to those of Heude's *Hemibia*, if discovered in such a locality, will probably be found to contain the cercariae of *Schistosoma japonicum*.

#### SUMMARY.

1. The habitat of the mollusk called by Heude, *Hemibia*, which acts as the intermediate host of *Schistosoma japonicum* in the endemic region about Soochow, China, is described in detail.
2. Possible seasonal variations of its habitat in this region are suggested.
3. Possible variations of its habitat in other endemic regions of China are discussed.
4. Evidence is offered that the intermediate host of *Schistosoma japonicum* probably exists in regions not yet endemic for the disease, and that the disease is still spreading in China.
5. A simple method is described for determining infection of a given snail by *Schistosoma japonicum*.

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#### EXPLANATION OF PLATES.

Figure 1 a. The snail which is called by Heude, *Hemibia*, the intermediate host of *Schistosoma japonicum* in the Soochow region. Magnified  $\times 5$ .

Figure 1 b. The same, life size.

Figure 2. The type of canal shore most frequently inhabited by Heude's *Hemibia*. This photograph was taken at a distance of four feet from the shore.

Figure 3. Terminal canal in the rice farm country north of Soochow, on the shore of which specimens of Heude's *Hemibia* infected with *Schistosoma japonicum* were first found.

Figure 4. *Melania cancellata*, a snail whose smaller forms may easily be mistaken for Heude's *Hemibia*. Note that the vertical ridges are more prominent and wider apart than those of *Hemibia*. Life size.

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## CONTUSED AND LACERATED WOUNDS OF THE SOFT PARTS

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RUSSELL F. MADDREN, M.D., Changsha, Hu.

More than twenty-three centuries ago Hippocrates classified wounds as incised and contused, and pointed out that while the former often healed *per primam*, the latter usually closed only after suppuration and the formation of granulation tissue. He recommended antiseptic treatment of an empiric sort, used boiled water for washing the wound, and called attention to the advantage of preliminary cleansing of the surgeon's hands. Rest and immobilization were important points in the after-care.

We classify "forcible solutions of tissue continuity" more elaborately and exactly to-day, but a large percentage of the accident cases that come to our attention have contused and lacerated wounds of the soft parts. This paper is based upon a personal experience of nearly twelve hundred cases of the last mentioned type in which complete and careful records were kept and studied.

Nearly fifty years ago Samson Gamgee, of Birmingham, England, published a book on wounds that well repays reading to-

day. He gave detailed clinical accounts of a large number of cases and emphasized the importance of support for the injured part. This he regarded as the prime essential in the treatment of accidental wounds.

At the time Gamgee published his book, Lister had completed his Edinburgh experiments on sterilizing gauze dressings by heat, but an elaborate ritual of "antiseptic" surgery was widely practiced. Wounds were deluged with potent chemicals and even forcibly injected with strong antiseptics. Gamgee showed how kindly many of them would heal if they were not scraped or scrubbed but merely freed of gross foreign bodies, coapted, and supported by the proper employment of compression, immobilization, and elevation. Gamgee's treatment can be improved upon in some respects to-day, but we do well to bear in mind his dictum of support.

When called upon to treat a severe laceration one should not touch the wound even with the gloved finger until ready to go ahead systematically and aseptically with a formal first dressing. Sometimes a spurting vessel or two needs to be checked (and for this purpose the Bunk angiotripsy forceps satisfies every requirement), but as a general rule it is well to pause to find out just what happened and how it happened. If the patient be not too severely injured, he should be questioned directly. This obliges him to collect his faculties and has an excellent psychic effect. If the injury is extremely severe, there will be others at hand in such an event who can supply the needed information.

While the history of the accident is being elicited, any preliminary treatment that may be indicated can be administered and the surgeon is enabled to form a general estimate of the patient and arrive at some conclusion about this particular wound. This tranquil and orderly procedure reassures the injured person and gives time for such preparations as may be necessary.

We are not always able to make a complete diagnosis from the history alone, but if we habitually secure a brief but exact and orderly account of what has happened, a diagnosis can be reached in a surprisingly large percentage of cases before the wound is explored. The routine practice of history taking will, for example, save one from committing such a grave and inexcusable error as inserting fingers or instruments into the depths of a laceration accompanying a compound fracture by *indirect* violence.

Having come to a tentative opinion about the case in hand and having had time to prepare to practise rigidly aseptic surgery, the actual treatment may be commenced.

Nitrous oxide and oxygen is an almost ideal anesthetic for emergency work but its proper and therefore safe administration requires that a trained anesthetist be on call at all times. Its cost also makes it practicable only in the larger clinics. It is, however, as barbarous as it is unnecessary to dispense with all anesthesia. The smallest hospital in China has novocaine or apothesine and adrenalin in stock. Aside from inhumanity, the casualty surgeon will find that a reputation for inflicting great pain will lessen his value to the community he serves.

When necessary, clothing is cut away. By following the seams this can be done without ruining what may be the patient's only garments.

The first step is to cleanse the skin adjacent to the wound with ether-soaked swabs without letting the ether flow into the wound. Some prefer benzine, carbon tetrachloride, McDonald's solution, or ethylene dichloride. Ether is the first choice of many because it is a good grease solvent, a vaso-dilator and has some inherent antiseptic power.

The second step is, without any shaving, to soak the entire field with three per cent solution of picric acid in grain alcohol. Iodine of the same strength is still advocated by some. When the coating is dry, and not until then, the surrounding skin, if hairy, may be dry-shaved. (A sharp razor and a light hand render this easy and painless). If the injury be severe enough to necessitate general anesthesia it should be administered as soon as the clothing has been cut away. During induction a large sterile dressing can be held against the lesion. The "haemorrhage pads" described in Mock's "Industrial Surgery" are eminently satisfactory.

Infiltration analgesia is not necessary until after the application of picric acid, for sensibility in contused wounds is slight for some time after the injury. When infiltrating the tissues, the sterile needle should not come in contact with the contaminated wound cavity but everywhere pass beyond its borders.

The third step is, using scalpel, scissors and thumb-forceps, to excise the wound. Often it is impossible as well as unnecessary

to make the excision *en bloc* and an atypical operation is performed. (Text-book illustrations of wound excisions are sometimes highly idealized.) All foreign bodies must be removed and every vestige of dead or irreparably damaged tissue must be cut away, starting with the contused skin edges (which should be made clean-cut and not beveled). Bleeding is arrested as encountered by the use of the Blunk forceps, for ligatures are foreign bodies and, as such, to be feared. Fresh surfaces should not be touched with anything except sterile instruments or stick-sponges. It is not safe to adjudge that injured muscle tissue may remain because it contracts when cut or pinched. It should be cut away until it bleeds freely. No watery antiseptic solutions are poured into a wound after an excision has been started; these are not necessary if the excision is complete and, by irritation, they retard repair and conduce to primary infection. Damage to deep-lying structures such as tendons or large nerves must be appropriately repaired; but such complications are beyond the scope of this paper.

The final step is to bring together all raw surfaces so accurately that no dead spaces remain to fill with blood or exudate. To accomplish this, buried sutures of fine catgut serve well.

The ideal material for skin closure is horse hair. It can be made surely sterile by boiling. It will stretch, if necessary, but does not subsequently contract and therefore will not cut like silk. The stitches should be just tight enough to hold the skin edges in apposition and silk-worm gut tension sutures may be required. Posture can at times be utilized to take tension off skin stitches. After approximation of the wound the skin is wiped with gauze sponges wrung out of 60 per cent. alcohol to remove blood and some of the picric acid or iodine. After the dressing has been applied, if the injury is of an extremity, the limb is placed in its proper "position of rest", bearing in mind the fact that it is going to be elevated.

Elastic compression is the final step we advocate. This may be accomplished by first applying a sterile roller bandage cut from a thin sheet of non-absorbent cotton wadding. The thickness of this layer will depend upon individual judgment but, as a general rule, one-third of an inch will suffice. Over this an ordinary muslin or gauze bandage is rolled on with just enough tension to put the entire wound and its surroundings under slight elastic

compression. This prevents venous stasis and consequent swelling and also helps to maintain the cut surfaces in exact apposition. The elastic layer of wadding in great measure does away with the danger that is otherwise inherent in any circular dressing and the wound is placed in optimum condition for repair.

In leg injuries the bandage should extend from the base of the toes as high as may be indicated. If the arm is wounded, only the tips of the fingers should be left exposed. Neglect of this results in an uncomfortable dressing and one that is a potential danger.

The injured extremity that has been compressed in the position of rest and elevation must be kept so placed. Moulded splints of plaster-of-Paris may be used; but, as a general rule, every indication may be met by strips of galvanized wire netting of about one-half inch mesh held in place by a few turns of bandage. These splints can be cut with tinsmith's shears and bent to any desired shape by the surgeon's fingers. Wire gauze splints were first recommended by Nott, in an article in the "*Memphis Medical Record*," a little over seventy years ago.

All seriously injured patients should be placed in bed in a hospital; but lesser injuries involving the upper extremities can often be treated satisfactorily with the patient up and about with the arm in a sling. The ambulatory treatment of all but the most trivial leg injuries is usually unsatisfactory. The writer has abandoned it as a waste of his own and his patient's time.

Whenever a circular dressing is put on an arm or a leg the danger of Volkman's paralysis must be kept in mind. Ischemic myositis is what Dr. J. B. Murphy used to call a "doctor's lesion." In most cases the damage is done in the first forty-eight hours. So, in spite of the fact that little pressure has been used and that of an elastic type, we must make absolutely certain to see the patient again within twenty-four hours. He should be instructed to loosen the dressing himself if he has pain.

Exactly what is meant by the "position of rest" is well described by F. W. Jones in writing of the hand in this position: "A hand is not in a position of rest when it is fixed flattened onto a splint with flexors relaxed but extensors on the stretch. No rest is obtainable at any time in any position in which any group of muscles is put under a tension to which those muscles do not attain

in a normal *resting* position. To determine the position of rest we must watch the part when relaxed in sleep, when nerve control is temporarily in abeyance and when the real 'postural tone' of the muscles alone is exerting itself. Then we shall see that the forearm is held somewhat pronated, that the wrist is flexed, the palm of the hand hollowed and the digits bent in towards the palm in *varying degrees*."

It would be absurd to assert that all wounds treated as above outlined heal by first intention. The writer makes no such claim, but he does know that this general method of treatment has shown a larger percentage of good results than he was able to secure by any less painstaking technique. It works as well in China as it did in industrial practice in America, although it is often harder to "follow up" cases here.

If the patient shows no evidence of infection, the first dressing need not be changed until it is time to remove the stitches. "Dressings should be changed for cause and not by schedule", as Da Costa says. Healing will usually proceed uneventfully and when the first dressing is removed in from six to ten days the limb will be found somewhat pale and shrunken and the wound cicatrized. When the stitches have been taken out a small sterile dressing can be lightly bandaged or strapped in place with adhesive plaster. This second dressing remains on for two or three days while the patient is regaining the use of the injured member and the healed wound is consolidating. When the second dressing is removed, he is ready to return to his work.

In a small percentage of cases the "fibrin temperature", which usually follows any injury of considerable severity, does not disappear. The symptoms and signs of inflammation supervene. Prompt removal of the dressing permits inspection of the wound. Sometimes cutting of a stitch or two will allow wound secretion to escape and, after this, the symptoms will abate and the wound go on to first intention healing. Whenever wound secretion is found in such a case it should be examined by culture, if possible, as well as by microscopic study of stained smears. If this precaution be neglected, sooner or later we shall lose a case from streptococcic infection that might possibly have been saved if the diagnosis had been made a few hours sooner. If smears are definitely positive



and it is certain that they were properly made, every stitch should come out and the treatment be changed to that proper for an infected wound.

In conclusion, it is well to recall the fact that prolonged immobilization is itself sometimes dangerous. Put the uninjured hand of an elderly working man in splints and leave it so, long enough, without massage or use and he will have some degree of finger stiffness that will remain permanent. A healthy joint in a young individual can be immobilized almost indefinitely without irreparable loss of function.

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### **CASE OF WOUNDED CHINESE WITH KNIFE INSIDE ABDOMEN.**

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SHIUCHOW *viz* CANTON.

The patient was a Chinese, aged about thirty years, who was admitted to the hospital here on April 29, 1923. He gave a history of having been stabbed in the abdomen, and stated that the weapon had disappeared inside. It was five days since the injury and he walked to the hospital. He said he had taken no food for some hours previous to the occurrence. On admission he did not complain of a great deal of pain, and his pulse was only 90 per minute and of good volume. On examination there were two wounds: one in the right rectus muscle about two inches below the umbilicus; the other in the left rectus below the sterno-xiphoid articulation. There was no rigidity of abdomen, nor fluid in the flanks, but the liver dullness was absent even in the mid-axillary line. On probing the wound in the left rectus, a hard object was felt at the bottom of a sinus, about  $1\frac{1}{2}$  inches long, leading downwards and slightly outwards. It was decided to perform an exploratory laparotomy.

On opening the peritoneum there was no escape of gas or fluid. The haft of the knife was seen almost surrounded by omentum. The blade was bent at an acute angle behind the stomach. After some difficulty it was extracted. No haemorrhage or escape of bowel contents followed its withdrawal. A tube was placed in the track in the omentum with a gauze drain inside. Owing to the matting of the tissues after five days, the absence of gas, intestinal

odour of contents, and the previous good condition of the patient, no attempt was made to examine the former site of the knife point, beyond palpation with the finger.

The wound was sutured in layers around the tube. The other wound was then explored, a haematoma cleared out and the bleeding point secured. At the close of the operation, which was prolonged, the patient's pulse was 144. At 10 p.m. it had settled down to 120 per minute.

Just at this time circumstances in our hospital were not very favorable for the treatment of critical cases, owing to the excessive number of surgical in-patients. As a result of fighting between Chinese soldiers, two hundred casualties had been admitted on the previous Sunday and Monday, and these cases, with the renewal of their dressings, kept our staff of twelve extremely busy. It was impossible, therefore to give this patient the constant and skilled nursing he required through the night. When he was seen by one of us, at 4.30 a.m. the following day, the attendant was fast asleep, the hot bicarbonate of soda solution for drinking had become stone cold, and the patient was in much the same condition as at the previous visit. He reacted somewhat to stimulants, but collapsed again. All efforts, including a pint of intravenous saline with five minims of 1 : 1000 adrenalin, failed to restore him, and he died at 11 a.m. the same day.

This case is not reported as a surgical triumph, but to record the following unusual points of interest :

(a) The disappearance of a seven-inch weapon, blade and haft, inside the abdomen.

(b) The fact of the patient's having walked to hospital, with the knife still in the abdomen, five days having elapsed since the infliction of the wound.

(c) The absence of gross injury to viscera or vessel, so far as could be ascertained; even if this did occur, the paucity of signs and symptoms was remarkable.

Unfortunately, being in China, and in a country district, the advisability of a post mortem to complete the scientific record and satisfy our own curiosity and surgical interest was not considered justifiable in view of the possible prejudice to future work.

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## THE DIAGNOSIS OF LEPROSY\*

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1. IMPORTANCE OF EARLY DIAGNOSIS.—The public in their ignorance of leprosy fluctuate between a great horror of the disease with panic when they hear of its presence, and on the other hand the greatest callousness regarding the danger of acquiring the disease by contact with lepers.

It is this panic and callousness which are the two greatest obstacles in stamping out leprosy. In communities where there is horror of the disease the unfortunate sufferers try to hide their suspected malady as long as possible, thus preventing early diagnosis and early treatment. Where the disease is treated with callousness the gradual onset of the disease and the absence of much pain or discomfort, especially where the skin is the seat of the disease, keep the patient from seeking expert advice until the symptoms are far advanced.

There are far more cases of early leprosy in India than is imagined. In a well-known medical school four lepers were found among the menial staff of sixty.

The importance of early diagnosis is very great as leprosy can in the large majority of cases be stamped out if diagnosed in its primary stages, but this becomes increasingly difficult and requires an increasingly long course of treatment as the disease advances.

Even among the profession there still exists considerable ignorance concerning the early signs and symptoms of leprosy and we have tried to concentrate the most essential points for diagnosis into this pamphlet.

2. THE TWO IMPORTANT POINTS IN DIAGNOSIS are the finding of *lepra bacilli* and the presence of anæsthesia.

(a) *Finding lepra bacilli in the skin or mucous membrane.* As leprosy is not found in the epithelium, microscopic examination of a scraping of the skin is as a rule useless. A clip, like a nail-paring, should be taken, preferably with a pair of medium sized scissors, curved on the flat.

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\*From the Director of the Calcutta School of Tropical Medicine and Hygiene.

The under surface of this piece of skin is pressed or rubbed on to a slide, dried and stained by Ziehl Neelson's method :—

Apply carbol fuchsin to the slide for ten minutes, heating till steam appears and then allowing to cool.

Wash and decolorise in 10 per cent sulphuric acid in alcohol for half a minute. Wash and counterstain for 2 minutes in methylene blue.

Wash dry and examine with  $1/12$  oil-immersion lens. The bacilli will be found, stained red in clumps and singly.

It is useless to take a clip from anæsthetic skin as lepra bacilli are seldom or never found; but one part of an affected patch may be anæsthetic and another part retain its sensation and show bacilli. In skin leprosy the likelihood of finding bacilli does not depend so much on the amount of swelling and apparent inflammation as on the age of the lesion and its depth in the corium and subcutaneous tissue.

(b) *Anæsthesia*. There are so many varieties and degrees of anæsthesia that it is well to choose a standard which has after prolonged use been found to be of practical application.

We have found the following method thoroughly reliable :

The patient is stripped as far as practicable and blindfolded. A folded piece of paper is used for testing sensation. The patient is asked to point out with his finger the part of the skin which has been touched with the paper.

Where there is anæsthesia he will fail to point out the area. Sometimes he will point not to the exact part touched but to a part outside the suspected patch of skin. This indicates *paræsthesia* and is due to the overlapping of the nerve supply of the skin.

When superficial sensation is not impaired the patient will point to the exact place where he has been touched. After repeating this same process several times to avoid error the anaesthetic patches may be marked out.

When either acid-fast bacilli are found or anæsthesia (as tested for above) is present a diagnosis of leprosy is almost always justified.

3. **SUBSIDIARY SIGNS.**—A combination of two or more of these may in the absence of the two important signs mentioned above lead to a strong suspicion of leprosy, but not a clear diagnosis.

- (a) *Deep analgesia.* This is sometimes found without superficial anæsthesia where the inflammation has affected a deeper layer of the corium. The patient can bear without pain the prick of a pin or the cut of a knife. A similar condition is found in syringo-mycelia where there is loss of pain and heat sensation without loss of superficial touch.
- (b) *Loss of the sense of heat and cold.*—This is often the earliest sign of nerve leprosy and may be found in the area round a spreading patch of anæsthesia. It may be tested for with test tubes containing hot and cold water.
- (c) *Hyperesthesia* also often precedes anæsthesia.
- (d) *Depigmentation.* This is a very suspicious sign, especially where the history shows contact with leprosy, but it is also met with in syphilis as well as in certain diseases which affect the cuticle such as pityriasis versicolor.
- (e) *Erythematous patches* are often the first sign of leprosy, though they are common in other diseases.  
Wide-spread erythema will seldom be present in leprosy without one or other of the first mentioned important diagnostic signs.
- (f) *Thickening of the superficial nerve trunks.*—The nerves most commonly found thickened are, in order of frequency, the ulnar, peroneal, great auricular, radial and external saphenous, though any of the superficial nerves may be affected. If the thickening is marked it is a strong presumption in favour of leprosy.
- (g) *Parakeratosis* with glossiness of the skin, thickness of the skin, especially in the palms of the hands and the soles of the feet, and inability of the hairs to protrude from the mouths of the hair follicles, inside which they remain bent up, is very characteristic of nerve leprosy. Parakeratosis is found in many mild irritating conditions of the skin, but the appearances produced are different in these from those found in leprosy.
- (h) *Anhydrosis.* This is another early sign of leprosy which may precede anæsthesia. Large areas of the body may be rendered dry and this is found especially in the distal parts of the limbs.

- (i) *Interfollicular Swelling*. A swelling of the areas between the interfollicular ridges of the skin is very characteristic of leprosy, the region of the corium between the hair follicles being the seat of inflammation which renders these areas prominent, while they are divided from one another by the resistance of the follicles which pass deep down into the corium. A similar appearance is found in *lichen planus*, but the lilac colour is wanting in leprosy. Where this condition is established, a clip from the skin is generally, though not always, positive for lepra bacilli. The presence of one or more of these subsidiary signs should be considered a sufficient reason for keeping a patient under observation. As a rule, if the case is one of leprosy, one of the two important signs will soon establish itself and clear up the diagnosis.

#### 4. DIFFERENTIAL DIAGNOSIS.—

- (a) *Syphilis* is one of the diseases that simulate leprosy most. This is natural seeing the corium of the skin is affected by syphilis as it is in leprosy. Depigmentation and erythema are two of the signs common to the two diseases and a diagnosis is often very difficult and depends upon the presence or absence of the two important signs.

The scalp is not invaded by lepra bacilli, but lepra-like lesions of the scalp are not uncommon in syphilis. The Wassermann test when negative is against syphilis, when positive it does not help very much, as the Wassermann reaction is positive in a large proportion of apparently non-syphilitic lepers.

- (b) *Psoriasis*. The radially spreading lesions of psoriasis often superficially resemble those of leprosy as both may have a raised spreading margin. The absence of anæsthesia and the negative bacteriological test, however, easily settle the diagnosis in most cases.
- (c) Various form of *tænia* (ring-worm) can also be diagnosed from leprosy by these two important signs being negative.
- (d) *Syringo-myelia* resembles nerve leprosy as there are wasting of the small muscles of the hand and sensory symptoms. The loss of sensation of light touch, however, is not lost, or at least not as a first symptom.

Loss of sensation of light touch is lost in some rare localised lesions of the spinal cord or in lesions of the proximal parts of the nerve trunks, but such lesions are not difficult to distinguish from leprosy as a rule.

- (e) *Tuberculosis*. Leprosy of the lung is not uncommonly found and may have to be distinguished from pulmonary tubercle. The large bundles of lepra bacilli are not as a rule difficult to distinguish from the sparser tubercle bacilli found in tuberculosis. If the case be one of leprosy there is almost a certainty there will be other definite signs of leprosy elsewhere in the body. The tuberculin test is of no differential diagnostic value in such cases as it is generally positive in both diseases.

Under treatment we have found that leprosy of the lung tends to heal up much more easily than the corresponding tubercular disease.

Both tubercle and leprosy may be found side by side in the lung, and tubercle of the lung may be found alone in leprosy patients.

Tuberculous lesions of the skin may be difficult to distinguish from leprosy lesions, but the absence of anæsthesia and the absence of acid-fast bacilli are generally sufficient to establish the diagnosis. Though neither of these may be present at first in the suspected lesion one or other will not long remain absent if the lesion persists and the case is one of leprosy.

##### 5. CONCURRENT DISEASES.—

- (a) *Syphilis* may often be found in company with leprosy. Indeed leprosy often lies latent in the body till it is brought out by an attack of syphilis. The diagnosis of this combination is very important as leprosy cannot be expected to improve under treatment till the syphilis has been cured.
- (b) *Hookworm, malaria and other debilitating diseases*, where present, must first be cured. They create a soil in which the lepra bacillus flourishes and it is often due to their presence that leprosy has been able to develop in the body.

- (c) *Tuberculosis* may exist alongside of leprosy. Acid-fast bacilli in the sputum may be either leprosy or tubercular or a combination of both. It is important to clear up the diagnosis in this direction as overtreatment where tubercle exists may lead to a dangerous reaction and spread of tuberculosis with the formation of fresh foci.
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### **NOTE ON THE TREATMENT OF LEPROSY.**

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LEE S. HUIZENGA, M.D., Taichow, Ku.

In and about Taichow, Ku., are many lepers and we have been treating several of them this past year with good results. The patients themselves are anxious to receive their weekly injections saying that they feel better than before, and this in itself is gratifying. Our treatment is not different from that generally employed. We have divided the cases into two series.

Patients in the first series get injections of the mixed ethyl esters of chaulmoogra oil sent to us from the Peking Union Medical College. We give gradually increasing doses, starting with one-half mil, every Saturday. As an aid to the treatment each patient is asked to do a little very easy work in the hospital yard, away from other people. He comes about nine o'clock in the morning and leaves about four in the afternoon. We feed him well, giving him wholesome food and plenty of it, and we try to keep him cheerful by speaking to him and daily encouraging him to persist in the treatment. He sleeps at home as we have no place in the hospital where lepers can be isolated.

The patients in the second series get the injections once a week in gradually increasing doses. At present they are getting two mls weekly. They go home the rest of the week. We do not know about their food and mode of living, but imagine their circumstances are far from favorable.

After several months of treatment we feel certain that the patients in the first series are doing far better than those in the second series. To make patients feel hopeful, and to take away the worry of the rice bowl, seems to us a very important part of the treatment.



## ON THE TREATMENT OF LEPROSY WITH DEAN'S DERIVATIVES OF CHAULMOOGRA OIL.

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G. L. HAGMAN, M.D., Nantungchow, Kiangsu.

In October, 1921, through the courtesy of the U. S. Surgeon General's office, the writer secured one litre of the ethyl esters of chaulmoogra oil from Professor Dean's laboratory in Honolulu. This was the so-called HI preparation, being the ethyl esters combined with iodine.

From December, 1921, to January, 1923, a period of fourteen months, twenty-two leprous patients passed through our out-patient clinic. All of these showed the presence of acid-fast bacilli in nasal smears. Two other suspected cases with negative smears were seen.

When a leprous patient appeared in the clinic, he was told that his case could certainly be cured by a course of fifty weekly injections. To test his faith and win his co-operation, a charge of \$5.00 was made for the year's course before the treatment was begun. Practically all of the patients were poor, several lived at distances prohibiting a weekly visit, and our clinic has been established only six years. These reasons, with perhaps others, reduced the number of patients willing to undertake the treatment to six.

The interesting notes on these six cases are as follows:—

PATIENT No. 2037.—A student of sixteen years of age, living at a distance of  $5\frac{1}{2}$  miles, came November 30, 1921. His illness had begun  $1\frac{1}{2}$  years before, with redness of face, and nasal discharge. The year before he had a deep ulcer on the sole of the foot; for six months crops of large vesicles on hands and feet, developing with fever, each crop breaking and healing in six days; anesthesia of hands and left foot, duration 5 months; progressive weakness since onset, steady increase of nasal discharge. Increased lacrymation was noted. Perspiration was absent from the body for two years. Examination showed the boy to be fairly well developed and nourished. Face red and swollen, with nodules in the supra-orbital region. All eyelashes and half of eye-brows gone. Small shallow ulcers on nasal septum with slight purulent discharge showing many acid-fast bacilli in smear. Large shallow ulcers on backs of hands and feet. In both hands *main en griffe* was present to a slight degree with atrophy and anesthesia. A deep ulcer, 3 cm. in diameter, was under the base of the great toe on the right foot. There was some anesthesia of both feet.

Injections of the Dean derivatives, "HI," were begun on November 30, 1921, with one mil and increased to six mils in nine weeks.

After the sixth week of treatment, the deep ulcer on the foot had healed.

By eighth week, the patient reported that the excessive lacrymation had improved but that pain continued at the site of injection for six days.

By tenth week, he reported a return of perspiration on the chest. He attributes this to the treatment and is very enthusiastic about it.

By fourteenth week, patient reported a returning of sensation in the hands and feet; hyperaemia of the face less marked.

By seventeenth week, perspiration present on all parts of the body except arms and legs. A few shallow ulcers are present on the dorsum of toes and point of elbow.

Twentieth week: redness of face has entirely disappeared; nodules less prominent.

Twenty-fifth week, face appears about normal except for absence of eye-brows. Patient is still weak.

Twenty-seventh week; recurrence of the perforating ulcer on foot, about 1 cm. in diameter.

Thirty-second week; a returning of strength.

Fifty-sixth week; very much improved, strength almost normal. All ulcers have healed. Patient can now straighten his fingers.

Fifty-ninth week; nasal smear negative for lepra bacilli.

Sixty-first week; nasal smear still negative.

Sixty-second week, February 8, 1923; nasal smear negative for lepra bacilli. Extension of fingers is complete, but atrophy and weakness of thenar muscles persist. Otherwise the patient thinks he is cured. The treatment is being continued.

PATIENT No. 483.—Male, Chinese, aged 23, servant in wine shop; lives 2/3 mile from the clinic. Illness began nine months before, with weakness of right hand, and general weakness of eight months duration; five months before had swelling of the face over facial bone and above eyes; three weeks before there appeared two large ulcers on the soles of the feet; two weeks before, had large ulcer on back of left hand, and has had persistent nasal discharge for several months.

Examination disclosed slight nodular swelling with cyanosis in the regions of the eye-brow and facial bone; outer half of eye-brows missing; eye-lashes sparse. Left hand shows a shallow granulating ulcer, 5 x 8 cm. Right hand shows atrophy of thenar muscles and *main en griffe*. Soles of both feet, on outer margin, showed ulcers 8 x 3 cm. on right, and 5 x 3 cm. on left. No anesthesia noted. Nasal smear shows many acid-fast bacilli.

Treatment was begun on February 18, 1922. After four weeks, the ulcer on the hand was completely healed

10th week; ulcers of the feet healed, bodily strength improved.

14th week; appearance of face very much improved, and of normal color. Condition of hand not improved. *Lepra bacilli* present in nasal smear.

15th week; patient failed to return for further treatment.

PATIENT No. 853.—Male, Chinese. Illness began one year before coming to hospital with stiffness of skin of forehead and cheeks. Swelling and redness of face for several months. For four or five months has had numbness of fifth and outer half of fourth finger of both hands, with some numbness of feet. Wine-coloured, elevated patches, one to four cm. in diameter, were present over chest, back and buttock. Loss of eye-brows with nodular swellings over eye-brows. Patient came for six injections only. No improvement noted.

PATIENT No. 1024.—Chinese, male, aged 17, farmer, lives 10 miles from clinic. Illness began three years earlier with anesthesia of hands and feet. He was unable to work because of weakness of hands. Has had no perspiration for three years; some loss of weight for two years; contracture of fifth finger, right hand; redness of hands and nasal secretion for four months; redness of face, one month.

Examination showed loss of lower eyelashes, nodular swelling and redness of face and chin, *main en griffe* right hand with anesthesia. Over the whole of the back and thighs and extending to the feet are slightly elevated, scaly, purplish areas, small and large.

Patient came for eleven injections; there was no improvement and he then discontinued his visits.

PATIENT No. 1595.—Chinese soldier, twenty years of age, came April 26th. Disease began one month ago with red, papular swellings, one cm. in diameter, on arms and face, which gradually increased in number and size. The cheeks then became red and swollen.

Examination showed considerable swelling of cheeks, chin, and anterior neck region. These swollen areas were papular and hyperaemic. Some anesthesia of both hands. No fever; strength not impaired. Nasal secretion showed many *lepra bacilli*.

After seventh injection of four mils, patient had a reaction with fever, weakness, and increased hyperaemia of swollen areas.

After fifteenth injection condition much worse; face and neck very much swollen with ulceration on the neck.

After twenty-fourth, slight improvement.

After thirty-sixth, swellings had entirely disappeared, leaving atrophy of skin and muscles about the mouth, with paralysis of these muscles. Face still red. There is foot drop on right side. Smear still positive for *lepra bacilli*.

After forty-second injection, February 7th, 1923, foot drop had much diminished and strength much improved; condition otherwise about as noted above. *Lepra bacilli* still present in nasal secretion.

PATIENT No. 4247.—Chinese, male, weaver, twenty-five years of age, came November 24th, 1921. Disease began four years before with swelling of face. Two years ago he noticed weakness of hands with muscular atrophy, deep ulcers on soles of both feet appeared seventeen months ago. He has had no fever or weakness, but a loss of perspiration below the waist line. Examination shows much swelling above eyes; eye-brows and eye-lashes absent; *main en griffe* present in both hands. Large deep ulcers on side of left leg; deep ulcers on soles of feet.

Patient has had twelve injections to date, February 8th, 1923. His face and the ulcers are much improved. Nasal smears still show many *lepra bacilli*.

A total of six patients were under treatment, receiving in all 157 injections. The preparation was sterilized under fifteen pounds steam pressure, unfilled flasks. The syringe and needles were boiled in water, no precaution being taken to dry them before use. No case of abscess occurred in the 157 injections. There was pain at the site of injection when larger amounts were given. This inconvenience was reduced by dividing the dose into two intramuscular injections made at different points, one into each buttock.

#### CONCLUSION.

Of twenty-two patients appearing in the clinic, only six were persuaded to consent to undertake a year's treatment. Of these six, only three are continuing the treatment to date (February 12th, 1923). One of the three has had sixty-two injections. This is the only case freed from *lepra bacilli* in nasal smear and which may probably be considered an arrested case. Another who has had forty-two injections was an early, very rapidly developing case. His disease continued to develop while under treatment and only showed very slight improvement after twenty-four treatments. There has been continuance of improvement, but *lepra bacilli* are still found in the nasal secretion. The third case, which is still continuing treatment to date, shows some improvement after twelve injections. The other three patients ceased coming for treatment after fifteen, eleven, and sixteen injections respectively. The one who had received fifteen injections showed slight improvement.

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### THE TREATMENT OF LEPROSY BY THE INFILTRATION METHOD.\*

Seeing that leprosy is chiefly due to the presence of lepra bacilli in the skin it stands to reason that whatever drug we use for the treatment of leprosy, the effect of that drug will be enhanced if we can bring it into close contact with the bacilli in the skin. Diseases such as itch, ringworm, etc., which are situated in the epithelium are treated with ointments and other applications, which are rubbed into or painted on to the epithelium. The seat of leprosy is deeper than the epithelium. Leprous lesions are in the corium and sometimes in the subcutaneous tissue. Moreover, one of the first effects of leprosy in the skin is to form a more or less dense layer of fibrous tissue in the most superficial layer of the corium, under which the lepra bacilli are situated. This being so it can be easily understood how the external application of a drug to the skin cannot bring that drug in contact with the lepra bacilli, though the friction employed may prove useful by increasing the cutaneous circulation and setting free lepra bacilli.

With whatever drug we desire to attack the lepra bacilli in the body, we must therefore either have it conveyed by the blood stream to the skin or else inject it subcutaneously so that it may at once come into direct contact with the lepra bacilli.

It is with this latter object in view that we recommend the infiltration method.

As the esters of the fatty acids of certain non-saturated oils, and especially of chaulmoogra and hydnocarpus oils, have been found remarkably efficacious in the treatment of leprosy, we have been using these esters in carrying out the infiltration method. Seeing, however, that the injection of the pure esters was too painful for the patient to continue the treatment over a lengthy period, we diluted the esters according to the following formula, adding camphor and creosote as anodynes and antiseptics :—

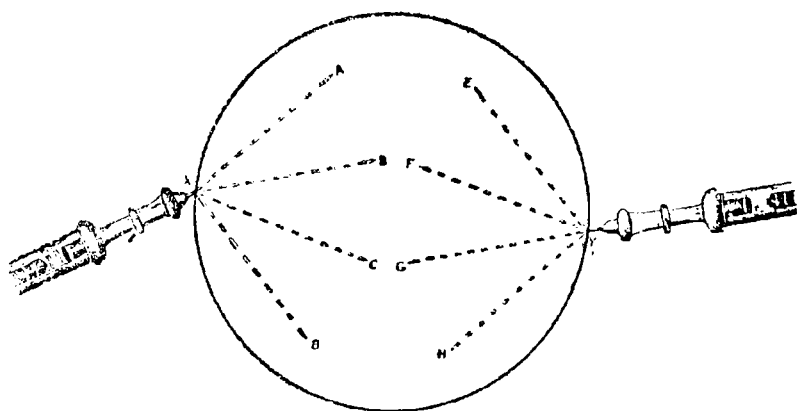
Ester of fatty acids of non-saturated oil	1 c.c. to 2 c.c.
Camphor                    ...                    ...                    ...                    ...	0.5 gram.

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\* From the Director of the Calcutta School of Tropical Medicine and Hygiene.

Creosote (doubly distilled) ... ..	0.5 c.c.
Olive oil (free of fatty acids) ... ..	3 c.c.

The olive oil should be sterilised by heating for half-an-hour on a water bath before adding to the mixture. It is well to keep the mixture for at least 24 hours before use. It should be kept either in glass ampoules or in a well-stoppered bottle.



SUBCUTANEOUS INFILTRATION OF LEPROUS LESIONS.

METHOD OF INFILTRATION.—This is illustrated in the attached diagram. An area of diseased skin is chosen (XY) and the needle is inserted at one of the poles, X. The needle is pushed forward in the subcutaneous tissue almost to the hilt and a fraction of the mixture is injected at A. By partly withdrawing the needle and reinserting it at a different angle fractions of the dose to be given may successively be injected at B, C and D, the skin only having been perforated once at X. In a similar way the other half of the area to be infiltrated is reached by inserting the needle at Y, from which the remainder of the dose is injected at E, F, G and H. As a certain amount of the mixture runs back along the line of the needle, pressure has to be made at X and Y after withdrawing the needle. While applying this pressure gentle massage should be applied over the infiltrated area so as to distribute the mixture and hasten absorption.

Care has to be taken that injection is only made into loose subcutaneous tissue. If the needle enters the skin at any point sloughing may result. Care must be taken that the point of the

needle does not enter a vein. This may be ascertained by applying slight suction by pulling on the piston of the syringe. If the point be in a vein blood will come running up into the barrel of the syringe. Care must be taken not to pierce nerves which run in the subcutaneous tissue. If a nerve is touched the patient will complain and the needle should be withdrawn and reinserted at a slightly different angle.

The injections cause but little pain if a fine, smooth, sharp needle is used. Where there is anæsthesia of course nothing is felt. Where, however, the patient dislikes the discomfort of the injection the skin area to be infiltrated may first be rendered anæsthetic by freezing with ethyl chloride. After the first few seconds there is absolutely no pain or discomfort if the infiltration has been properly carried out.

**COURSE OF THE TREATMENT.**—The injections should be given twice a week or even oftener, provided there is no marked reaction produced. The temperature should, where possible, be taken and recorded four times daily so that any febrile reaction may at once be noted by the physician. The first injections should contain the proportion of 1 c.c. of the ethyl esters. When 4 c.c. of the mixture have been reached a stronger mixture containing 2 c.c. of the esters or even more may be used. The initial dose may be from 0.5 to 1 c.c. according to the nature of the case and be increased by 0.5 c.c. at each injection provided there is no febrile or focal reaction. The more acute the case and the greater the number of lepra bacilli estimated to be in the body the smaller should be the initial dose and the more cautiously should the dose be increased. For each injection a fresh leprotic area is selected and infiltrated in the same way as we have described above.

In this way the whole of the affected area of the body is gradually covered. Thereafter the previously injected areas may be again injected in order. Areas like the chin, where it is not possible to find loose subcutaneous tissue should be injected with care, only small quantities of the mixture being injected at one time.

Injections should be continued in cases of skin leprosy until the skin has become negative bacteriologically, and even after that for some time. In nerve leprosy the injections should be continued till all signs of anæsthesia have disappeared or till at least all temporary lesions have gone. Those lesions which after a prolonged

period of injections show no tendency either to increase or to diminish may be counted as permanent lesions. As to which non-saturated oils are the most useful for the treatment of leprosy as described above we are not yet in a position to say. At present we recommend the use of *hydnocarpus* and *chaulmoogra* oils as we have had most experience of their beneficial effects. It may, however, be proved later that linseed, soya, cod liver and other oils are equally if not more efficacious.

It is at present impossible to say to what extent the beneficial effects of the mixture are due to the other constituents. In nephritis creosote is contra-indicated if the quantity of albumen in the urine is increased.

RESULTS OF INFILTRATION.—The immediate result is a certain amount of local swelling and induration of the infiltrated area. Within 3 or 4 days this begins to subside and beneficial changes begin to show. Where the skin area has been depigmented the pigment begins to show and within a fortnight there is as a rule a well marked degree of return to the normal. Where there has been anaesthesia we have found the sensation rapidly restored in cases where a prolonged course of intramuscular and intravenous injections had ceased to cause further improvement.

In the grosser lesions where abundant bacilli are found in the skin and there is considerable thickening, the lesion tends to heal up much more rapidly. Not only this but the general effects of skin infiltration are more marked than when the same dose is given intramuscularly. The drug is more rapidly absorbed as it has been spread over a larger absorptive area. Thus we see other diseased areas which have not been infiltrated tending to clear up more rapidly. Not only are the injected drugs absorbed from the subcutaneous surface but the bacillary toxins of the infiltrated area are also absorbed and stimulate the formation of antitoxines. Further the local effect of the mixture besides acting directly on the bacilli is to stimulate the cells to destroy the bacilli while the serous infiltration tends to prevent the broadcasting of bacilli from broken down lepra cells throughout the body.

A very great advantage over all previous methods of treatment by injections is that by this method while there may be some slight pain during the time of infiltration there is no pain afterwards.



We have found that patients prefer it on that account. The patient moreover is able to see definite results within a limited time, though it may only be over a limited area of the body. He is thus encouraged to go on with the treatment for as long a period as may be required.

Skin infiltration may be combined with intramuscular injection of the undiluted esters where the patient can stand it.

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### **THE HOOKWORM PROBLEM IN CHINA.\***

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NATHANIEL BERCOVITZ, M.D., Kachek, Hainan.

The hookworm problem in China presents so many aspects which differ from the same problem in other countries that special methods will have to be worked out adaptable to conditions here.

In America it has been comparatively easy to educate the public, which fact, backed by efficient medical agencies, has greatly reduced infection in the Southern States.

The International Health Board has carried anti-hookworm campaigns to many places with remarkable results. These places, however, are countries where the government has become interested, and where the public health service has co-operated in the campaign. The work in the West Indies, Trinidad, Antigua, etc., has had the moral and practical backing of the Colonial health officials. In this way educational campaigns were facilitated, the examination and treatment of large numbers was easy, and the installation of permanent sanitary improvements became possible.

In Ceylon and some of the Central American countries large plantations furnish employment to thousands of laborers. It was to the interest of the owners of these estates to have healthy workmen, and they gladly co-operated with the International Health Board in the treatment and prevention of further infection with hookworm.

Briefly stated the hookworm problem in China is complicated by four very important factors : 1. The universal use of nightsoil

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\*This article was received by the Journal in October, 1920; it has been examined recently by the author who has not found it necessary to make any changes. Further reports of the hookworm campaign in the Kachek region will appear later.—Ed.

as fertilizer. 2. The general illiteracy of the great masses of the people, which makes education in hygienic and sanitary matters difficult and slow. 3. The instability of the central government, and unorganized public health service which precludes help from official sources. 4. The absence of extensive plantations. Were there such estates in China the owners could be induced to consider the problem from its economic aspects, and compel the treatment of employes and the improvement of sanitary conditions on the estates. To these four factors must be added the vastness of population and area of the country. The hookworm problem, formidable under most favorable conditions, becomes almost overwhelming in China.

The intensive farming methods of the Chinese make the use of nightsoil as fertilizer indispensable. Working in the fields in bare feet causes the infection with hookworm. We have here a vicious circle of the worst kind—feces loaded with the ova of hookworm which become larvae in the fields, infecting the laborers. To do away with this is the crux of the whole hookworm situation in China.

Four years ago in the *China Medical Journal* (March, 1919), the author suggested the septic tank as a means of destroying, among other pathogenic micro-organisms, the ova of hookworm. With reference to the ova of hookworm the statement was incorrect as later observations showed the presence of such ova in the second chamber of the septic tank. There was something, either the season of the year, or the concentration of the fluids, or the depth from which the specimens were taken, which affected the presence of the ova, as a series of centrifuged specimens showed no ova at that time. In the summer and fall of 1919 further studies showed the presence of ova, not in large numbers, but they were there, and cultural experiments showed that most of these ova were viable. Again there were times when repeated examinations showed no ova present. It is possible that the ova which are present in the second chamber may be remainders—those not destroyed in the first chamber. At the present time experiments are being undertaken to show the effect of depth of fluid and concentration of feces on the viability of the ova, and numbers of ova found in the second chamber in relation to the total numbers of ova in the feces which enter the first chamber. These experiments will be reported later,

but for the present the septic tank, notwithstanding its usefulness in destroying bacteria such as typhoid and cholera, cannot be regarded as the means of destroying all the ova of hookworm.

It is obvious that the conditions peculiar to China will make the task of breaking this vicious circle a long one. However, it would seem that there are certain lines which the anti-hookworm work will have to take.

For the present, at least, there is no agency in China, besides the Mission Hospitals, which can deal with the situation. Were there a strong central government with a well organized public health service the story might be different. In that case the public health service, aided by commissions such as the International Health Board, could do the work. Such a situation would be most desirable, but unfortunately it does not yet exist.

The Mission Hospitals are on a peculiar basis. They have the good of the people whom they serve; they have opportunities for education of pupils in Mission schools; they can carry on educational campaigns along with the evangelistic work in the region which furnishes their constituency. And they can also carry on anti-hookworm work in towns and villages where educational work has prepared the people.

This method has proved practicable in the Kachek region. A senior student in the Hunan-Yale Medical College, whose home is in Hainan, went to his village for the summer vacation. The Kachek hospital furnished him with a microscope, slides, containers for feces, haemoglobinometer, medicines, and literature. A number in that village had been treated for hookworm in Kachek, others had learned about hookworm in the Mission schools, and others had heard lectures on the subject by missionaries. In the course of the short time he was home this man examined 114 cases of whom 84% were found infected. And as a result of his work other villages near by have asked us to send men to treat the people. In places in this district the infection runs as high as 95 per cent. Contact with these people has created open doors, and altho the work will naturally be slow, it will be done, and best of all, will be voluntary on the part of the people, who are being brought to a realization of the condition they are in. This is the result of systematic education, the illustrated charts and pamphlets published by the Council on Health Education being effectively used.

Right here a most important point must be noted. The treatment for hookworm will be of little permanent benefit unless reinfection can be prevented. At present the problem of the safe use of night soil, in view of later findings in the septic tank, is still unsolved. People must use the nightsoil as fertilizer, and will work in the fields in bare feet.

Two methods to limit reinfection are available.

The first method is based upon frequent treatment of infected persons in a given community, until ground infection is lowered to an irreducible minimum.

The degree of infection in a given case depends upon the number of worms in the intestine. Each worm represents the entrance of a separate larva into the body, either through the skin, or directly through the mouth. It would take a certain length of time, therefore, to produce a heavy infection with severe anaemia and constitutional symptoms.

If the persons of a given community be treated the feces of these people will at first contain few or no ova, the number of ova gradually increasing as reinfections take place. But for a certain length of time, at least, there will be a marked decrease in the number of ova which reach the ground. This will reduce the number of larvae in the ground; and as a consequence the number of larvae entering the bodies of laborers in the fields will be fewer for a certain length of time.

Now, it is reasonable to suppose that, in a given community, if all the people are cured, in the course of six months a number of these will not yet be reinfected. Furthermore, those who are reinfected would hardly become heavily infected in that length of time. The larvae, also, of hookworm in the ground would naturally be reduced, not only because fewer ova would be present in the feces, but also because larvae in the ground would in time tend to die.

Six months after treatment, therefore, the general health level as regards hookworm would be considerably higher than it was before treatment. It would tend, however, to reach the pre-treatment level with increasing rapidity.

If, however, at the end of six months, all cases found reinfected were treated, by the end of a year the health level would be still higher. True, in the second six months some of those not found

reinfecting at the end of the first six months would become reinfected. But the net number of ova in the feces would be less than the number found after the first six months, and the ground infection also would be considerably reduced,

In this way hookworm could be stamped out were it not for the fact that laborers in the fields would be constantly reinfected, even if only lightly. However, if such a community is visited every six months, or even once a year, hookworm could be kept down to a certain minimum below which it could not be further reduced. But heavy infections with the resulting grave anaemias would not be found, and to a large extent, hookworm would cease to be a menace. The health of the community would be bettered, and greater interest in sanitary measures taken.

It is proposed to follow this course of action in the communities in the Kachek region treated for hookworm. This will eventually call for one or more anti-hookworm teams spending the entire time in field work. But this will prove worth while, not only from the standpoint of sanitation, but also because of opportunity to do evangelistic work among the people treated. The value of community work cannot be over-estimated.

The second method proposed for the prevention of reinfection is based upon the use of agricultural machinery in farming, thus doing away with laboring in the fields in bare feet.

Such a suggestion raises at once a discussion of the whole economic life of the nation in relation to its food products. It is not the purpose to go into this subject except to note that the introduction of machinery for farming would benefit the nation by increasing the food supply because of the possibility of increasing the acreage under cultivation, and it would also release large numbers of people who are now bound to the soil because of the necessity to raise food to support life, for productive industries. In Hainan, for example, this would mean the development of the copra, sugar, coffee, and rubber production. Machinery is being used in the rice fields in America, and can be used in China. The progress of China will depend upon the growth of its productive industries.

If communities treated for hookworm adopt the use of machinery for farming a great source of infection will be removed.

The schools and colleges of China will have to bring this about, and physicians, because of the sanitary aspects of the question, will have to help in this too.

It would seem, therefore, that the Mission Hospitals will have to extend the scope of their work to include anti-hookworm campaigns if the problem in China is to be met.

It might be well, in view of the great extent of the disease, for the China Medical Missionary Association to elect an anti-hookworm Commission which would undertake to make surveys, and plan campaigns for treatment. This commission would cooperate with Mission Hospitals in their work, in fact the chief object of such a commission would be to facilitate the anti-hookworm work of the hospitals.

It is asking a good deal for a person to be an active Christian, or to become interested in the Gospel with his haemoglobin 25 per cent. to 30 per cent. of normal, and myriads of parasites draining his life blood. A great opportunity exists for evangelistic and educational agencies to cooperate in this work. After all, it is as the Mission agencies reach the people in their lives, in their homes, that such agencies really become of the greatest value.

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### **A NEW THEORY AS TO THE CAUSATION OF SPRUE AND THE RESULTS OF TREATMENT BASED THEREON.\***

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About a year ago I became impressed by the remarkable similarity existing between many of the symptoms of sprue and those occurring in other diseases in which calcium deficiency, or disordered calcium regulation by the parathyroid glands, plays a part; such symptoms, for example, as tetany, cramps, loss of weight and, at times, oedema.

At that time, however, there was no opportunity of doing any work to test this point, but subsequent examinations revealed the fact that the coagulative calcium, as estimated by the ammonium

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\*Preliminary communication. From *Trans. Roy. Soc. Trop. Med. and Hyg.*, February 15th, 1923.

oxalate method of Wright, in some cases of sprue is normal, or nearly so. It, therefore, seemed probable that the calcium in some other form might be deficient. This receives support from the work of Vines, who has shown that calcium is present in the blood in two forms; the combined or "coagulative" and the "ionic," and that the latter is deficient in such conditions as gastric, duodenal, and varicose ulceration. Also, "since calcium metabolism is controlled by the parathyroids, the property of tissue repair may be assigned indirectly to these glands." (Vines)

I have recently had an opportunity of treating a case of sprue of nearly two years' duration, in which practically all the symptoms had been present and all the known forms of treatment had been adopted—orange santonin, Salisbury, milk, vaccines, emetin, without the production of more than temporary benefit.

Treatment by calcium alone was now first tried, but led to merely temporary and partial improvement, so trial was then made of combining the calcium with parathyroid administration and the results were most striking. The cramps, the soreness of the mouth, the acidity and flatulence rapidly disappeared, the stools regained their normal colour for the first time for nearly two years, and the patient steadily put on weight with marked improvement in the general state of health.

My theory is this: in endemic areas the conditions are such that there is an excessive proteid or fatty diet, or a method of cooking which tends to lead to an acid dyspepsia, combined often with an excessive ingestion of citrates in fruit which may combine with the calcium. Excess of proteids stimulates over-production of acid in the gastric juice, or, what amounts to the same thing, may lead to a higher working level of acid, that is, habitual overacidity; or the fatty diet and the monotony of the food lead to a lowering of digestive activity, whereby fermentation, catarrh, dyspepsia and intestinal toxæmia result.

The entrance of acid into the duodenum stimulates the production of secretin, so there is habitual over-production of secretin; over-production of secretin leads to over-stimulation of the pancreas, with the resultant hypersecretion from this organ, and, secondarily to this, an upset in the balance of other endocrine glands, among them the salivary glands and the parathyroids.

Again, the diet above mentioned sets up, or tends to lead to, a condition of intestinal toxæmia, or allows the growth of some organism which itself sets up such intestinal toxæmia.

Evidence is accumulating that endocrine disturbance and alimentary toxæmia are frequently associated. Also, as Vines has suggested, all acute and chronic toxæmias react in some degree on the parathyroids, causing disturbance of calcium metabolism and a consequent decrease in tissue resistance, a vicious circle being thus set up. Hence, the benefit obtained by the use of autogenous vaccines in some cases of sprue, the organisms being responsible, in part at least, for the toxæmia which proves too great to be dealt with by parathyroids with depreciated function.

There is evidence for each step in the sequence of events. In some parts of the world where the disease is endemic, for example, India, meat is taken in excess by Europeans, although in that country "the proportion of animal food in a suitable mixed dietary should be less than one in four;" also, meat has been proved to produce a flow of gastric juice large in quantity but poor in ferments, and "persons who live largely upon meat have usually a more acid gastric juice than those who partake more freely of vegetables." (R. Hutchinson). Also, "If the meat diet is excessive there will be undigested food in the bowel along with unabsorbed peptones and albumoses. Putrefaction occurs and various poisons are produced by further metabolic action, so that we have the condition known as intestinal toxæmia." (Balfour.)

Fat, on the other hand, which is used to excess in Chinese cooking, and in Spanish countries, such as Porto Rico, for example, has an inhibitory effect on gastric secretion, hence the effort to stimulate a poor or jaded digestion by spices, curries, perhaps alcohol. Fermentation arises and an acid dyspepsia is set up.

Starling and Bayliss have shown how secretin is produced from prosecretin on the entrance of acid into the duodenum, and thus the acidity of the gastric contents is the great stimulant of pancreatic secretion, and "hyperchlorhydria overstimulates and finally exhausts the pancreas." In sprue, the condition does not go so far as this. The gastric secretion in this disease has been shown to vary; there may be hyperchlorhydria, or hypochlorhydria with acidity due to fermentation and organic acids. The stimulation is



evidenced by the results of analyses of the stools. Normally, neutral fats are to fatty acids in the proportion of about 1 to 2; in pancreatic disease this ratio is reversed and may be as high as 15 to 1; in sprue, more splitting up of neutral fats takes place, the proportion to fatty acids being as 1 : 3, 1 : 4, or even 1 : 5 (Thomson).

Further details cannot be entered into a note such as this—the effects of intestinal toxæmia on stomatitis, the relation of calcium metabolism to loss of weight, the inter-relation of both with the parathyroids, and so forth.

\* Further experimental work is being undertaken, including the estimation of “ionic” calcium in a series of cases, with a view to the preparation of an amplified paper for reading and discussion at some future meeting of the Society, if an opportunity can be found. \*

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### UNUSUAL CASE OF LEAD POISONING.

JAMES L. MAXWELL, M.D., (Lond.) Tainan, Formosa.

Lead poisoning is met with from time to time among the Chinese, most commonly among painters. It is however anything but common, and among women must be very rare. On this account, and because of the very unusual source of the poisoning, I think the following case is worth recording.

A Chinese woman, aged 35, presented herself for treatment at our dispensary recently complaining of chronic indigestion and constipation. On telling her to put out her tongue I noticed a peculiar condition of her gums and on closer examination found a very well marked blue line both above and below. The diagnosis was very evident, the only question arising being the source of the lead poisoning. On enquiring into her occupation she told me that she was employed in a “Bad Dollar Shop”. To be precise, her work was to melt down bad dollars, which are mainly composed of lead, in order to recover from them the silver that they contained. This, apparently, was the only source from which the infection could have been derived.

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\*For an interesting note by Dr. G. Duncan Whyte on this treatment of Sprue, see the “Correspondence” in this number of the *China Medical Journal*.

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No. 7

## THE RED CROSS IDEAL.

Just one week after the United States entered the great world war, twenty-four prominent men from all parts of the country met in Washington, at the invitation of President Wilson, to consider means of financing the American National Red Cross. All agreed that the funds should be raised by a nation-wide popular subscription and all but two thought that about five millions, or at the most, ten million dollars, would be all the money that could be raised for this purpose. The two who thought differently were Henry Morgenthau, a Hebrew, born in Germany, but an intensely patriotic and idealistic American, formerly American Ambassador to Constantinople, who perceived in the Red Cross movement immense possibilities for helping mankind generally; he suggested that the minimum sum should be fifty million dollars. The other who hopefully disagreed was Henry P. Davison, the Chairman of the Committee, who said even fifty millions were quite inadequate: at least 100 million dollars should be raised. The Red Cross "drive" actually brought in 110 million dollars.

When the war had ended, Morgenthau, as narrated in his very interesting autobiography recently published under the title, "All in a Life-time," was asked to serve as a delegate to the Conference at Cannes for the formation of the International League of Red Cross Societies. Before his departure from the States, an interview was published giving his opinion of what the Red Cross might be able to accomplish. "I am going to Europe," he said, "to assist Henry P. Davison in his work of organizing the Red Cross for the great mission which I believe it is called upon to perform in the world.

"We have a very definite vision of what this work is to be. The League of Nations, when it is formed, will necessarily confine its administration to the more material-aspects of government, such as boundaries, armaments and economic questions. There is need, therefore, for a League to care for the human wants and moral aspirations of all people. This other 'League of Nations' may be

the international Red Cross, which enlightened men and women are now engaged in forming. I am to assist in that work. It is a work dear to my heart, something for which for many years I have felt there is a definite need."

"The Red Cross, in the new and more splendid opportunity that has come to it, because of its services in the great war, is the medium, I believe, through which all true lovers of mankind may aid in making the world a better place to live in."

This ideal was also held by seven leading physicians of the United States who were travelling with Morgenthau as fellow delegates to the same Convention.

All these delegates agreed that the organization of the Red Cross ought to become more militant and endeavor to reach with curative and preventive measures into the innermost recesses of both hemispheres where diseases originate and dense ignorance prevails, and that efforts should be made to remedy the intellectual deficiencies as well as the physical weaknesses of backward peoples. Accordingly, a memorandum was prepared, which was later presented to the Conference, recommending a broad international programme of this character.

At first the spirit of the Conference was very fine. It seemed as if the delegates had pledged themselves to assume boldly this new task of brothering, to a greater extent than ever before, those who were crying for help. It dawned upon them all that perhaps the millions of members of the Red Cross Societies all over the world, with other millions that would join later, could establish a permanent organization that would put into practical execution all the teachings of religion, science, education, medicine, hygiene, and sociology. "While those in Paris were rearranging the boundaries, we were trying to develop the universal spirit of service to all humanity which would recognize no boundaries, or class distinctions, or religious differences."

These large hopes were quenched by counsels of prudence. It was decided by the Conference that the early activities of the International Red Cross were to be limited to those of an international health and statistical bureau; that the international societies should deal only with general hygienic improvement and child-welfare, and that even in these matters the central organization, instead of doing the actual work should leave that to

the constituent league of members and confine itself to the development of policies and the collection of statistics.

With such a limited field Morgenthau feared "that the League of Red Cross Societies would become a soulless bureau; that it could not undertake any of the broader activities we had hoped for, and that this wonderful nucleus of millions of adult and junior humanitarians would never be transformed into that army of world welfare-workers which some of us had dreamed about and that all mankind so sorely needs. Subsequent events have justified my fears."

The world moves very slowly and other political and social ideals evoked or strengthened by the war, besides those of the Red Cross, have receded into the distance. Perhaps the foundations of active philanthropic work of this high order are not yet sufficiently broad and deep, and therefore more "spade work" must be done. Or it may be that the foundations of international comity and friendly co-operation will be laid, to some extent at least, by organizations concerned with public health other than the Red Cross. A most significant development in this direction is the recent creation under the League of Nations of a Health Organization which has the direct support of fifty-two nations. It is receiving generous financial support from the Rockefeller Foundation which is doing a large work in the field of international hygiene. The difficulties of so large and important an enterprise are fully perceived, yet they are not held to be insurmountable. Thus in a recent report by the Rockefeller Foundation there is the statement :

"It must be owned that there is to-day a suggestion of irony in smooth phrases about co-operation, understanding, and good-will among the nations. Suspicion, distrust, detraction, hatred, and threat of war are all too prevalent in the relations of the peoples of the world. Scientific comradeship and common tasks of hygiene seem almost negligible as bonds of unity. But the difficulty of a task is no excuse for not attempting it. Because it is not possible to predict the early dawn of a millennial peace, there is no good reason for not taking steps which seem to lead toward even a remote era when nations may substitute generous rivalry for deadly conflict. To stimulate world-wide research, to aid the diffusion of knowledge, to multiply personal contacts, to encourage co-operation in medical education and public health are the means by which the Rockefeller Foundation seeks to be true to its chartered purpose, which is to promote, not the exclusive prosperity of any one nation, but 'the well-being of mankind throughout the world.'"

To return to the main point. In this Journal it has been urged more than once that a properly organized and directed Red Cross could do most valuable work in China, not only by disseminating an elementary knowledge of sanitation and the causation and simple treatment of many diseases and injuries, but also by giving instruction in the ethics of warfare such as the necessity of showing mercy to prisoners and wounded foes and the protection of non-belligerents; and by endeavoring to link the different Red Cross branches together in the spirit of brotherhood. If there must be war, let us endeavor to make it as humane as possible, while hoping for the time when the Christian spirit shall put an end to all internecine strife between nations.

China is now in such a state of political and social disorder that the possibility of fully realizing the Red Cross and other ideals here outlined seems very remote. It is a question well worth careful consideration whether our Association ought not to take a more active part to strengthen the local Red Cross organizations which exist and try to make the movement truly national.

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### **PRESIDENT LI YUAN-HUNG ON MEDICAL WORK IN CHINA.**

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A translation of the address by the President of China to the Faculty and students of the Peking Union Medical College at the closing exercises of the Academic year is here presented :

“Coming into contact with Western civilization, China has undergone a great change in the last fifty years. Nothing has done so much to modernize China as modern medicine. The dissection in anatomy alone has removed a great superstition regarding the dead and thus opened the highway to scientific progress. The increasing demand for more hospitals in recent years shows what great influence modern medicine has gained in this country. It is not too much for us to look forward for the day when public health in China rises to the same level as in the most progressive countries in Europe and America. The day will not be far off if necessary effort is exerted for it.

“The establishment of this great institution has furnished the Chinese people a concrete example as to what should be done for medical education. We are confident that the right response to such a stimulation will come forth as soon as the country returns to normal condition. In the meantime, whatever the members of the teaching staff of this college do will heighten in no small degree this stimulating effect. It is therefore appropriate for us to express on this occasion our appreciation of their great service in training up a group of useful citizens for China.

“To the students of the class which is completing its work in the premedical school I want to say a few words of encouragement. Under the inspiration of your teachers you will be able undoubtedly to attain a high degree of perfection in your training for the medical profession. You are entering upon a new epoch of modern medicine in this country. An unusual opportunity for medical service is awaiting you. May I therefore offer you my warmest congratulation on your accomplishments and my best wishes for your success.”

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**C. M. M. A., RESEARCH COMMITTEE.**

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**CHINESE DRUGS OF THERAPEUTIC INTEREST TO  
WESTERN PHYSICIANS.**

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PROF. B. E. READ, DEPARTMENT OF PHARMACOLOGY. PEKING  
UNION MEDICAL COLLEGE, PEKING.

The subject of Chinese drugs is so extensive that it has been thought desirable to indicate in what way interested persons should proceed in order to effect good cooperation with laboratory workers and to promote general research along these lines. The following subjects have been suggested for investigation :

1. *Arsenic*.—Its use by old Chinese doctors. Its dosage and general effects as noted by a modern physician.
2. *Worm Remedies*.—With the scarcity of santonin and other efficient anthelmintics it will be of great interest to obtain further information on Chinese treatment. The use of *quisqualis indica* (使君子) is well known.
3. *The Use of Lang Tang Tze* (蔞蓂).—Botanical identity, particularly as sold in the South. (See *Jour. Orient. Med.*, Vol. 1.)

4. *Chinese Seaweeds*.—The iodine and arsenic content. (See *Pharmaceutical Journal*, 1922 : cix ; 86).
5. *Indian Turnip Poisoning*.—The Chinese antidotes for poisoning by arisema (天南星). (See *Ch. Med. Jour.*, 1917. xxxi ; 392).
6. *Euphorbiaceous Plants*.—Chemical observations on the effects of Chinese medicines containing these euphorbias. Do they set up nephritis?
7. *Toad Remedies*.—What are the various uses of toads in Chinese medicine? Do they affect the heart? (See *Jour. Am. Med. Assn.*, lvi ; 151).

From the research list of the Pharmaceutical Conference the following subjects particularly call for study in China :

1. *Oil of the soya bean*.—Can this be utilized more widely in pharmacy?
2. *Illicium religiosum*.—An investigation is required of the histological character of the fruits. (Already undertaken).
3. *Santonin*.—Analyses are required showing the percentage of santonin in species of artemisia. (See *Ch. Med. Jour.*, xxxvii ; 147).
4. *Coloring Agents*.—An investigation with a view to determining the most suitable coloring agents for syrups and other galenicals. Red haw.
5. *Deterioration*.—Some drugs, chemicals and preparations are subject to deterioration in storage. An investigation is required with a view to reckoning the extent to which articles can be kept for a reasonable length of time under normal conditions. It would be of great service to hospitals in China to determine the time of deterioration of such things as ammonium carbonate, sweet spirits of niter, digitalis, ergot, adrenalin, etc. In this section, however, such a study would apply more directly to the common insect pests which infest the store rooms of the native drug shops.

All materials sent to a laboratory for examination should, as far as possible, contain the following particulars :

1. Chinese name.
2. Nature of substance (animal, mineral or vegetable).

3. Botanical name, or biological characteristics, if known.
4. Source of material.
5. Form and method of presentation of drug. (Pill, decoction, etc., external or internal), size and interval of dosage.
6. Nature of disease treated. (When possible give scientific diagnosis with clinical laboratory findings if any; urine, blood, gastric analysis, feces, etc.)
7. Clinical results from use of drug.
8. Toxic symptoms referable to the drug. Gastro-intestinal irritation? Nephritis? Nervous symptoms? Wakefulness? Roaring in ears? If fatal, give autopsy results, if any.
9. Personal impression of effects of the drug.
10. Chinese ideas of its toxicity for domestic and other animals.

NOTE:—The composition of medicines in pills or composite powders is too obscure. Such should not be sent to the laboratories in China for examination at present. Drugs for examination should be sent each by itself, not mixed with other drugs, and should be accompanied by as much of the above information as possible. For example, in submitting a substance like false anise the following should be the form:

1. Chinese name: 大料
  2. Nature of substance (animal, mineral or vegetable.): Fruit of a climbing plant.
  3. Botanical name: *Illicium religiosum*.
  4. Source of material: Any of the common fresh vegetable shops in North China.
  5. Form and method of presentation of drug: It is stewed with meat to impart its aroma.
  6. Nature of disease when treated: Not used by physicians but is the means of accidental death or suicide when eaten raw.
  7. Clinical results from use of the drug: None.
  8. Toxic symptoms referable to the drug: Intense gastro-intestinal irritation causing vomiting. Later, there are intense medullary convulsions which terminate fatally.
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## **Hospital Reports.**

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### **ALDEN SPEARE MEMORIAL HOSPITAL, YENPING: 1922.**

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Staff: Dr. C. G. TRIMBLE; Dr. W. T. LI;  
Nurse, Miss M. E. HUFFAKER. Seven Chinese Assistants.

It is now eighteen years since this hospital of fifty beds was established and during the whole of this long period its doors have not been closed a single day. The number of in-patients in 1922, was 1,168. Operations with general anaesthetic, 116. As to the future, "with our staff about up to standard, as far as standards on mission fields go, with equipment sufficient to meet immediate needs, with an X-Ray machine and laundry machinery on the road out from America, we are looking forward to a good year in 1923. New buildings are our greatest needs. The old building simply will not hold together much longer. We hope and pray that some money may come to hand soon so that building operations may be started in 1924."

**Canton Hospital, Canton.**—Eighty-seventh Annual Report, 1922.

STAFF.—To attend to the patients, the Canton Hospital has 18 physicians, specializing in Surgery, Medicine, Eye, Ear, Nose and Throat, Roentgenology and Pathology, Gynaecology and Obstetrics, and Public Health. There are 35 Nurses. The Hospital has also a Business Manager and five other members of the office staff, three Evangelists and fifty-nine other employees.

During the year, 16,656 patients were treated, of whom 2685 were inpatients. There were in the Hospital at the beginning of the year 120 patients and there were 37 births. The total inpatient days was 47,294.

Including the maintenance of five staff members contributed by co-operating Missions, the gross income was approximately Mex. \$101,957., and the expenditures \$109,000. The net income was Mex. \$79,957.55 and the expenditures \$87,030.90. Average cost per patient per day, \$1.74.

The Report of the Board of Directors states that the Canton Christian College having declined the invitation to act as nucleus

in the reorganization of the Hospital management and hold the property for the new organization, the Board, acting upon the recommendation of the Staff, proposed that the Mission Boards with medical work in this Province be requested to take over the management and control of the Institution and thus efficiently carry out the objects of the Canton Medical Missionary Society, which the Society is unable to do itself and which the Canton Medical Missionary Union has only partially been able to accomplish. The main factor is a large, full time Staff, and only the Mission Boards can secure and finance this. The Chinese community, which chiefly benefits from the services of the Hospital, and the China Medical Board of the Rockefeller Foundation, which has set itself the task of increasing the efficiency of medical work in China, should help to provide the new buildings. It is proposed that the American Presbyterian Board be asked to hold the title deeds to the property, on behalf of the Mission Boards, for the purpose of carrying out the objects of the C.M.M. Society. This Board, for a period of sixty years contributed the services of the Hospital Staff with their fees, so has been certainly the greatest individual factor in the development of the Institution. In addition the American Presbyterian Board has already a large medical work here, together with a Medical School which could be made co-educational, when the correct time arises.

In its notice of the appeal for more generous financial support, the *Canton Daily News*, June 25th, 1923, comments editorially as follows: "Primarily established for the care of the poor we are glad to note the quality and earnestness of the staff therein. These faithful workers labor for love and ask in return little of the luxuries and material compensations of life. Thus in ministering to their bodily ailments they have not lost sight of the equally important healing of the soul."

"In thus looking after the sickness and contributing to promote the health of our community, the Canton Hospital is no small adjunct to the forces that make for a better Kwangtung. It deserves every due consideration and support from the government and people alike, and we trust the response will be quite generous and the appreciation deep."

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**A PLEA FOR THE MORE THOROUGH TRAINING  
OF MICROSCOPISTS IN THE DIAGNOSIS  
OF INTESTINAL AFFECTIONS.**

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BY PROFESSOR FRANK G. HAUGHWOUT. Protozoologist and Chief of  
the Section of Parasitology, Bureau of Science, Manila, P. I.

Several years' experience in the laboratory diagnosis of intestinal affections commonly occurring in the tropics, and an equally extended experience in the instruction of men sent to fill positions in this part of the world where they are expected to perform work of this kind, has led me strongly to the belief that one of the most urgent problems in tropical medicine of the present day is afforded by the microscopist who has attained to a state of perfect confidence in his own misconceptions.

A large proportion of the diagnostic methods practised in the laboratory have been so systematized as to have become mechanical operations to a large degree and the average man well-trained in serology and bacteriology does not ordinarily go far astray. It is a most surprising thing, however, how far a man who carries on such work successfully can stray from the bounds of reason when he essays to assemble a mass of microscopic evidence and weave it into a diagnosis of some intestinal disorder.

For many years it has been part of my work to review the activities of various laboratories and individuals in this connection, and at times I have found this a most depressing task. Leaving aside the reports rendered by "pathological laboratories" (a most descriptive phrase), conducted by obviously ill-trained and unscrupulous men who not infrequently work in concert with equally uninformed and sometimes unscrupulous practitioners, I find myself almost daily confronted with the often dire results of ignorance or prejudice on the part of untrained men. It is hard to place the full responsibility for this. Where open dishonesty can be ruled out, it would seem to be the product of misdirected effort in the class room, and indifference on the part of the student. In other words, it indicates a total lack of comprehension of the factors involved in the microscopic diagnosis of intestinal diseases, and a lack of appreciation of the fact that the progress of knowledge in

protozoology, bacteriology, and pathology during recent years has yielded very definite criteria on which findings, in the general run of instances, may be made with a high degree of accuracy.

I have sought the opportunity to address this gathering through the courtesy of Dr. Steinmetz, who has kindly consented to read this paper for me, because of my belief that the untrained microscopist is a real peril in every institution in which he is allowed to carry on his work, largely because of the confidence the clinical men have grown to place in laboratory findings, and also because of the fact that the diagnosis and treatment in a large proportion of intestinal disorders hangs so heavily on accurate work in the laboratory.

I have seen so-called "epidemics" of amœbic dysentery continue in institutions for weeks or even months, during which time the patients have been treated with emetine, usually in amounts insufficient to cure an amœbic infection. Invariably I have found on investigation that these "epidemics" of amœbic dysentery have been epidemics of a mild type of bacillary dysentery, mixed with occasional cases of non-specific gastro-intestinal complaints and complicated by a state of hysteria on the part of the staff that has led to all manner of absurdities. The responsibility in these instances I have found to rest heavily on the shoulders of the microscopist, the clinical men, in a measure, having been the victims of circumstances. Study has revealed errors in the interpretation of microscopic evidence that it is impossible to believe could be made by men who have studied histology, pathology, and parasitology, until one meets them face-to-face. This evidence has been of a nature that should be perfectly clear to the man who has acquainted himself with the pathology of the various intestinal processes and certain associated factors.

It has been my experience that an alarmingly large number of cases of dysentery in private practice, also are incorrectly diagnosed and, as a result, improperly treated. Extenuating circumstances may be cited in connection with the clinical man in the absence of proper laboratory facilities, but little excuse can be found for the laboratory man who has a good microscope, and is able to secure material for study within a reasonable time after its passage by the patient. The publications of several investigators of established ability and reputation during the past few years, have placed within

easy reach the criteria on which, in the vast majority of cases, the microscopist can make a relatively rapid and accurate differential diagnosis.

Moreover, the mythology of parasitology, particularly that part concerning the activities of the intestinal protozoa, that has littered the textbooks and journals for years and which has brought untold discomfort and expense to many human beings, has been exploded and there is no longer any excuse for the treatment of infections that we now know to be perfectly harmless.

In dealing with a problem such as this, it is rather dangerous to quote statistics unless they are known to come from a source in which we can, for one reason or another, feel a reasonable degree of confidence. Statistics bearing on the relative frequency of amoebic and bacillary dysentery are almost certain to be inaccurate unless the work has been done by men of experience.

I think, however, that it is fairly safe to say that in the majority of communities where systematic studies have not been made by competent men, that the incidence of amoebic dysentery has been over-estimated. Moreover, large numbers of persons are subjected to treatment for dysentery of one or the other type, who in fact are not suffering from dysentery at all. The physician coming to the tropics for the first time is apt to be surrounded by what might be termed a *dysentery aura* whose brilliance is in indirect proportion to the extent of his knowledge as to what dysentery really is. As a result of this, unless he has the help of an old hand, every diarrhoea becomes a dysentery, and most of his mild bacillary dysenteries are diagnosed as amoebic dysentery.

The patient pays the toll. I have studied the faeces of numerous persons before and during the time when physicians, who might have been engaged in worthier work, have been giving them injections of bacterial vaccines for the treatment of "chronic bacillary dysentery," and have found in the specimens no trace of evidence of any pathologic process. I have studied, over long periods of time, the faeces of patients under emetine treatment for an infection they never had, but who, on the contrary, gave an unmistakable history of bacillary dysentery, incorrectly treated and which left in its train a non-specific chronic ulcerative colitis, aggravated by an unregulated diet—the heritage of the microscopist's original error, and its too ready acceptance by the clinical man.

It may be thought that I am unduly severe, but the criticism is not made in a captious spirit, for it is my belief that most of these mistakes are born of ignorance. On the other hand, however, it has been long a source of astonishment to me to note the number of well-trained and otherwise generally competent laboratory and clinical men, who are sent to work in the tropics with scarcely any knowledge that will enable them to diagnose accurately and correctly treat one of the most common, and at the same time important, clinical conditions, that is, dysentery, and at the same time distinguish it from other intestinal disorders.

It is hard to preserve one's patience in the face of the calm disregard of perfectly clear evidence. The faculty of tolerance is severely taxed when on adequate study of a case presenting no evidence that could, on reasonable exercise of ingenuity or imagination, be woven into a diagnosis of dysentery and in which *Entamoeba coli* has been found, to see the patient placed on intensive emetine treatment. Our resistance breaks down utterly when the ministering physician blandly remarks: "That may be true, but an amoeba is an amoeba to me, and when I see one I give my patient emetine." Then we know that our friend has drunk at that fountain of knowledge which, as Jonathan Swift says, "has the faculty of teaching its readers to find out a meaning in everything but itself."

I often doubt the wisdom of reporting the presence of any protozoön save *Entamoeba histolytica* and *Balantidium coli* in a specimen of fæces submitted for diagnosis. That is because I have often seen patients subjected to costly hospitalization and treatment for infections with *Trichomonas* and the other flagellates, as well as other species of amoebae. This is aside from the extreme discomfort to the patient of the treatment that generally is instituted, and the absurdity of such measures as the attempted removal of *Giardia* infections by colonic irrigation. I believe the point of view of Professor Clifford Dobell in regarding *E. histolytica* and *Balantidium coli* as the only intestinal protozoa of real medical importance, is quite correct. Moreover, while Professor Dobell needs no defense from me, I feel constrained to concur heartily with nearly all the views he has expressed in his recent publications concerning the significance and activities of the intestinal protozoa of man. This is not a matter of prejudice, but simply the outcome

of the fact that my own rather extended observations under favorable conditions coincide with his.

It is my belief that many men in charge of institutional and other laboratories, would profit greatly by instruction in the modern methods of coprology, by which they could be taught the importance of appraising the microscopic picture as a whole. I also believe that much good could be accomplished by acquainting the clinical men with the significance of the laboratory findings, and encouraging better team work between the clinical men and the laboratory men in the diagnosis and treatment of intestinal affections. Instruction of this kind would best be given in the several institutions by an experienced man with a roving commission who would visit the various institutions, spending sufficient time in each to make the instruction effective. Such a man could aid the local staff in the formulation and solution of local problems.

In a measure, this duty falls upon the medical schools, but my experience with numerous graduates of institutions of even the best class is that even when the instruction is theoretically of a high order, its best results are not realized until actual experience on an extended scale has come about. Even the best books on the subject cannot take the place of competent supervision of the student. Without it, he inevitably forms misconceptions and becomes confirmed in them. In the class room he seldom has the opportunity to make more than passing study of "typical specimens." He has no opportunity to familiarize himself with the numerous variations from the normal. Knowledge of these comes only with the experience furnished by the critical study of numerous "stools" of varying degrees of freshness, with someone behind him to keep his feet in the right path.

Leprosy, malaria, and hookworm claim their thousands and furnish the basis for the spectacular medical enterprises that are working great good the world over to-day, but after all the matter of diagnosis in these diseases is not subject to great error and sanitary principles are well established. From the very nature of the case, however, we can form no really accurate idea of the number of lives that are unostentatiously snuffed out, or the toll of invalidism that results from carelessness and ignorance in the diagnosis and treatment of the very common intestinal affections. While there undoubtedly are many institutions possessing the services of

thoroughly competent men whose percentage of incorrect microscopic diagnoses is as low as can be expected, there are many others the critical inspection of whose records and methods would reveal a highly regrettable, not to say reprehensible, state of affairs. Corrections of these conditions is important anywhere, but it is doubly important in countries where the incidence of intestinal diseases is high, and where it is sought to carry on relief work or lead an ignorant population to better things.

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## China Medical Missionary Association.

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### MINUTES OF COUNCIL ON MEDICAL EDUCATION

June 25, 1923.

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A meeting of the Council on Medical Education was held at the Peking Union Medical College on June 25, 1923, at 2.30 p.m.

6. *Members Present*: Drs. Balme, Ellerbek, Heath, Houghton, John Kirk, McCracken, J. L. Maxwell, and Yen.
7. *Confirmation of Minutes*: The minutes of the meeting of February 20, 1923, were approved as circulated.
8. *Recording Secretary*: Dr. J. C. McCracken was appointed recording secretary.
9. *Requirements of Approved Schools*:

Voted: That the Council recommend that the following be regarded as the minimum requirements of medical schools approved by the Association:

- (a) *Entrance Standards*. Admission from a recognized Middle School, followed by a premedical course covering a minimum two-year course of study including the minimum standards in Chemistry, Physics, and Biology laid down in C. M. M. A. Premedical Syllabus as follows:

Chemistry: 4 semesters work in general inorganic chemistry, qualitative analysis, quantitative analysis, and organic chemistry.

Physics: at least 3 semesters work, of which not less than a half should be devoted to individual laboratory work.

Biology: 200 credit hours, of which no less than one half should be individual laboratory work.



- (b) *Length of Required Course.* A minimum of five years, of which the last year may be devoted entirely to clinical or laboratory work.
- (c) *Curriculum.* The medical curriculum shall include the minimum number of hours in pre-clinical and clinical subjects respectively, as laid down in the approved Syllabus (Minute 12, below), as follows: Pre-clinical subjects—not less than 1800 elapsed hours. Clinical subjects—not less than 1800 elapsed hours.
- (d) *Faculty.*
1. The teaching of the fundamental pre-clinical sciences (Anatomy, Histology, Physiology, Physiological Chemistry, Bacteriology, Pathology, Pharmacology) shall be in charge of those only who have had specialized training and experience in such subjects.
  2. There shall be at least three full-time teachers, to be in charge respectively of the departments of Anatomy and Histology, Physiology and Physiological Chemistry, Pathology and Bacteriology.
  3. In centres where part-time expert teaching service is not available, there shall be a minimum full-time faculty on the field of fifteen individuals. In these localities where such part-time teaching expert service is available, ten full-time appointees on the field shall be considered the minimum acceptable to the Association.
- (e) *Laboratory Facilities:* There shall be provided laboratories adequately equipped for the individual teaching of students in Anatomy, Histology, Embryology, Physiology, Physiological Chemistry, Bacteriology, Pathology, Pharmacology, and Clinical Diagnosis.
- (f) *Human Dissection.* Each student shall be required to dissect at least half a human cadaver.
- (g) *Clinical Facilities.*
1. There shall be a hospital or hospitals under the control of the school with 150 beds and one or more daily dispensaries.
  2. Each student shall be required to be present at, at least, six maternity cases.
  3. Each student shall be required to be present at, at least, twelve autopsies.
- (h) *Other Teaching Facilities.*
- (1) A working medical library including modern text and reference books, and receiving at least 25 medical periodicals to be accessible to the students.

- (2) A working medical museum, with anatomic, embryologic, pathologic, and other specimens, duly prepared, labelled, and indexed.
- (3) Opportunities for experimental laboratory work.
- (4) A sufficient supply of auxiliary apparatus such as manikins, stereopticon, X-rays.

**10. *Registration of Approved Schools.***

Voted : That facilities be offered for the voluntary registration of any medical schools in China desirous of being recognized as approved schools of the Association; and that the Executive Committee be requested to take the necessary steps to provide for the investigation of such schools and the registration of those which conform to the required standards.

**11. *Eligibility of Graduates for Admission to Membership of Association.***

Voted :

1. That from the date of registration of any medical school as an approved school, all future graduates of that institution be eligible to membership of the Association.
2. That the Council, recognizing that certain individual graduates of schools not yet recognized by the Association may be desirable candidates for membership in the Association, would suggest to the Executive Committee the following criteria for the consideration of such candidates for membership :—
  - (a) Evidence of capacity for scientific progress, as shown by
    - (i) Service in a reputable hospital for a period of not less than two years, or
    - (ii) Pursuit of graduate studies for not less than one year in a medical school recognized by the Association.
  - (b) Evidence of good moral character and professional ideals.

**12. *Minimum Standards of Medical Curriculum.***

Voted :

1. That the minimum course of instruction shall consist of four sessions of not less than 32 weeks each, in four calendar years, comprising a total of not less than 3600 hours devoted to professional subjects.
2. That of the minimum total of 3600 hours, 1800 hours be regarded as the minimum for teaching pre-clinical subjects, which, it is suggested, might be divided in some such way as the following :

Anatomy, Histology and Embryology...	...	640	hours
Physiology and Physiological Chemistry	...	436	"
Pathology, Bacteriology and Hygiene...	...	520	"
Pharmacology and Materia Medica	...	204	"

3. That of the minimum total of 3,600 hours, 1,800 hours be regarded as the minimum for teaching clinical subjects, which it is suggested might be divided as follows :

Medicine, including laboratory diagnosis, Pediatrics, Nervous and Mental diseases, Medical Juris- prudence, Dermatology and Syphilology	... 880 hours
Surgery, including Orthopedics, Urology, Ophthal- mology, Otology, etc. and Roentgenology	... 648 „
Obstetrics and Gynecology	... 272 „

**13. Premedical Committee.**

Voted : That the following be requested to serve on the Premedical Committee for this biennium :

W. H. Adolph,	(Tsinan) Chairman
N. Gist Gee,	(Peking)
K. Witt,	(Mukden)
C. B. Chatfield,	(Changsha)
W. M. Porterfield,	(Shanghai)
A. R. Knipp,	(Canton)

**14. Premedical Syllabus.**

Voted : That the Premedical Committee, as constituted above, be requested to distribute among premedical teachers the special syllabus on premedical studies prepared in November, 1919, and to secure their opinions with regard to the suggested revision of the same.

**15. Joint Examination Board, and Coöperation with Chinese Educational Authorities.**

Dr. Ellerbek drew the attention of the Council to the advisability of organizing a Joint Examining Board for approved medical schools, and also of cultivating closer coöperation with the Chinese educational authorities. Dr. Ellerbek did not consider that the time had yet come for any definite action to be taken.

Adjourned.

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## PNEUMONIC PLAGUE

Dr. Wu Lien-teh, Chief of Manchurian Plague Bureau Service, on June 18th, 1923, sent the following telegram from Manchouli to the *North China Daily News* of Shanghai : " The Chinese Research Expedition, working in Siberia with the Soviet doctors, under my leadership, has finally traced the origin of the Manchurian plague epidemics to Siberian marmots.

"Numbers of sick and dead animals have recently been found, from which arose two fatal cases among the Russian hunters.

"Our relations with the Soviet are most cordial."

## **REPORT ON THE REORGANIZATION AND FUTURE WORK OF THE COUNCIL ON HEALTH EDUCATION**

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Growth in the scope of the work of the Council and the enlarged opportunities for an increase of health activities in China recently made it appear advisable to reorganize the Council on Health Education. The New Constitution, which is a part of this report by the representative of the C.M.M.A. is published in this (July) number of the Journal. Under instructions from the Council on Public Health of the C.M.M.A. a brief review of the present status of the Council on Health Education is made in the belief that the members of the Association will be interested.

It will be recalled that the Council was originally formed in 1915 as a national correlating agency to promote hygiene development in China. The initiative in organization was taken by the Y.M.C.A., the C.M.M.A. and the National Medical Association. Indicative of the increased importance in which preventive medicine is held, the Council now has three additional participating organizations, the Y.W.C.A., the China Christian Educational Association and the Nurses Association of China. These six organizations provide support to the Council by allocating personnel, direct financial contributions or through active cooperation in executing the program of the Council. The C.M.M.A., through its Executive Committee, is supporting the Council this year by a contribution of \$2,000.00 Mex.

The purpose, basis of membership and policy of the Council although fully described in the Constitution are of sufficient importance to merit discussion in this report.

The purpose of the Council is to conserve and promote health in China.

Membership in the Council consists of such national organizations as desire to promote health through coordinated effort.

The policy is to pursue efficiently certain practicable objectives relating to specific health activities such as pre-school child welfare, school hygiene and health education, and general community hygiene.

Even as recently as 1915 there was so little interest in China in public health that an organization like the Council on Health Education had first to undertake the arousing of public opinion by general health education campaigns. It should be a matter of considerable satisfaction to all that within so short a period the Council now feels able to plan specific health activities for the future based upon a reasonable assurance that public opinion has reached the stage where such specific work will be supported. The policy of the Council is being narrowed down from the general to the specific.

The community hygiene program includes fewer publicity campaigns than have been carried on in the past and will limit itself to those cities offering the assurance that such campaigns will be followed by some type of permanent health organizations committed to specific objectives. In addition, this division of the Council will undertake to add materially to the very valuable collection of health literature and illustrative material already prepared. The report of Lennox in 1920 on "The Health of Missionary Families in China", and the health survey of Kuling by Atwater in 1922, prove that past negligence on the part of Christian workers to conserve health is resulting in an inexcusable waste of life and money. This division of the Council is also to participate in promoting the use of more efficient machinery whereby the health of Chinese and foreign workers may be better protected. For with all the medical knowledge available now as compared with thirty years ago, health conservation is largely a matter of developing machinery to apply knowledge.

The educators of the country are awaking to the realization that one of the main objects of education is to fit students to adapt themselves successfully to their environment. This adaptation includes a knowledge of health and disease on the part of everyone. A separate division of the Council is undertaking school health work by planning for demonstrations in mission schools, which for the coming year will be chiefly in East China. It is hoped to secure some minimum standards in school sanitation, to undertake the medical inspection of school children and the correction of defects found as well as to teach hygiene. The past few months has seen a large increase in the material possessed by the Council relating to school work and any interested in securing forms for

school medical inspection or syllabi of instruction on sanitation of schools, methods of physical examinations, and health teaching would do well to write to Shanghai for the material that has already been assembled. This material is by no means to be regarded as entirely adequate, for it is hoped that the next few years will see great improvement made largely through the suggestions that will come from members of this Association. To prepare teachers in hygiene education, the Council invited Dr. J. H. Gray to conduct an experimental summer school last year in Kuling. This summer there will be held four similar institutes in Canton, Kuling, Shanghai and Tsinan.

Much of the prevention of physical defects is wasted effort if delayed until the school age. The Council is therefor continuing work leading to the establishment of health centers where infant and pre-school welfare work can be carried on. The collection that has been made of charts, equipment, etc., should permit of a very considerable work being done by those utilizing them in this field of preventive medicine.

The members of the C.M.M.A. have been largely instrumental in achieving whatever success the Council has had. With the larger and more specific program now being undertaken the Council feels confident of continued support. This can best be expressed by the extent in which the personnel and material of the Council are utilized by the medical man on the field. The Council on Health Education would appreciate letters of comment and constructive criticism from members of this Association as to how it may the better meet their needs for its fundamental purpose is to conserve and promote health in China by a coordination of effort chiefly through its constituent bodies.

JOHN B. GRANT.

*C.M.M.A. Representative on  
Executive Committee, C. H. E.*

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## **COUNCIL ON HEALTH EDUCATION**

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### **CONSTITUTION AND BY-LAWS**

**PREAMBLE** :—The National Committee of the Young Men's Christian Association, the China Medical Missionary Association, the National Medical Association, the National Committee of the Young Women's Christian Association, the China Christian Educational Association and the Nurses Association of China, desiring to conserve and promote health in China, and having in the past been associated together in an informal way, in order to insure the continuation of the work on a more permanent basis, and to provide for expansion, do hereby adopt the following Constitution :

#### **ARTICLE I. NAME**

The name of this organization shall be the Council on Health Education. Chinese, 衛生教育會.

#### **ARTICLE II. PURPOSE.**

The purpose of the Council on Health Education is to conserve and promote health in China primarily through the constituencies of the participating organizations.

#### **ARTICLE III. BASIS.**

*Section 1.* The Council on Health Education is an entity. The return on investment of the constituent bodies shall lie in the accomplishment of the purpose of the organization.

*Section 2.* Representation on the Executive Committee of the Council on Health Education presupposes the direct interest of represented organizations in the work and, where possible, in the financial support either through allocation of staff, direct gifts, or the making of contacts which may bring financial support. No organization, however, shall be held responsible for any financial obligations incurred by the Council in excess of commitment made to the Council.

#### **ARTICLE IV. MEMBERSHIP.**

*Section 1.* Membership in the Council on Health Education shall be made up of such National Organizations as are interested in and desiring to promote health through co-ordinated effort.

*Section 2.* Membership is attested by the appointment of one representative to the Executive Committee of the Council on Health Education.

*Section 3.* At the time of the adoption of this constitution, the members of the Council on Health Education are :

China Medical Missionary Association.

National Committee, Young Men's Christian Association of China.

National Medical Association of China.

National Committee, Young Women's Christian Association  
of China.

China Christian Educational Association.

Nurses Association of China.

*Section 4.* After the adoption of the Constitution, power to admit new members rests with the Executive Committee of the Council on Health Education.

*Section 5.* Any organization desiring membership in the Council on Health Education shall present its request to the Executive Committee of the Council at a regular meeting. Action on the request shall not take place at the same meeting.

#### ARTICLE V. ADMINISTRATION.

The affairs of the Council on Health Education shall be administered by an Executive Committee composed of the representatives of the participating organizations and such persons as the Executive Committee shall co-opt. Co-opted members may have a voice but not a vote.

#### ARTICLE VI. OFFICERS.

The officers of the Executive Committee shall be Chairman, Vice-Chairman, and Secretary. The Treasurer shall be appointed by the Executive Committee. The Director shall be *ex officio* a member of the Executive Committee.

#### ARTICLE VII. AMENDMENT.

This Constitution may be amended at an annual or special meeting called for that purpose by a two-thirds vote of the Executive Committee provided that notice of such amendment be given at least one month in advance.

### BY-LAWS.

#### CHAPTER I. MEETINGS.

*Section 1.* There shall be an Annual Meeting of the Executive Committee of the Council on Health Education on the first Saturday in January to consider the following special items of business :

- (A) Annual reports covering preceding year's activities  
by the (a) Chairman  
(b) Director and Staff  
(c) Treasurer,
- (B) Program of work for the ensuing year,
- (C) Election of Officers for the ensuing year.

*Section 2.* The Executive Committee of the Council shall meet on the first Saturday of each month at 9.00 a.m., excepting July, August and September.

*Section 3.* A Special Meeting of the Executive Committee of the Council may be held at any time upon call by the Chairman, or Vice-Chairman.



## CHAPTER II. ADMINISTRATION.

*Section 1.* The Executive Committee shall be responsible for the administration of the work of the Council on Health Education. They shall

- A. Be responsible for the policy of the Council,
- B. Appoint the staff,
- C. Draw up the budget,
- D. Secure support,
- E. Transact business.

*Section 2.* Two-thirds of the voting members shall constitute a quorum.

## CHAPTER III. STAFF.

*Section 1.* The Executive Staff of the Council on Health Education shall be composed of a Director, Associate Directors, Field Associate Directors and Assistant Directors, to be appointed by the Executive Committee of the Council on Health Education.

*Section 2.* The Executive Staff shall be responsible for the general program on health education of the Council on Health Education subject to approval by the Executive Committee.

*Section 3.* The first responsibility of all members of the Executive Staff of the Council is to the Executive Committee of the Council.

*Section 4.* One member of the staff shall be responsible for the administrative work of the Council and shall be appointed Director.

## CHAPTER IV. DUTIES OF OFFICERS.

*Section 1.* The Chairman shall preside at all meetings of the Executive Committee, give a casting vote when necessary, appoint all committees not otherwise provided for, order reports, enforce the observation of the By-Laws, and perform such other duties as custom and parliamentary usage may require.

*Section 2.* The Vice-Chairman shall assist the Chairman in the discharge of his duties and shall preside in his absence.

*Section 3.* The Secretary shall have charge of the minutes of all of the meetings of the Executive Committee.

*Section 4.* The Treasurer shall receive and have charge of all funds of the Council. He shall establish and maintain a system of office accounting and pay all bills authorized in conformity with the same. He shall report monthly and annually on the financial condition of the Council.

*Section 5.* The Director shall perform the customary duties of an executive; he shall correlate the work of the staff of the Council in relation to the objective as outlined and shall be responsible for measurable accomplishment of that objective; he shall be Chairman of the Executive Staff and shall be responsible for regular staff meetings and for development of group action; he shall have first responsibility to the Executive Committee for

the execution of the program of the Council; he shall be responsible for the development of Chinese leadership looking forward to eventual Chinese direction.

#### CHAPTER V. BRANCHES.

A local Branch of the Council may be formed provided the Constitution of such Branch is in full harmony with the Constitution and By-Laws of this Council on Health Education, and, provided that it is formally recognized by the Executive Committee of the Council on Health Education. Such a Branch shall be called the (name of locality) Branch Council on Health Education.

#### CHAPTER VI. AMENDMENTS.

These By-Laws may be amended by a two-thirds vote of the members of the Executive Committee at an annual or regular meeting provided that notice of such amendment be given at least one month in advance.

#### CHAPTER VII. SAVING CLAUSE.

This Constitution and these By-Laws of the Council on Health Education shall take effect immediately upon their adoption by the constituent organizations, but shall not be construed to invalidate any act of the Executive Committee, or of any officer thereof, done prior to or pending organization under this Constitution and these By-Laws.

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PUBLIC HEALTH AND INTERNATIONAL WELFARE.—The problems of Public Health in the early days of the NINETEENTH century were almost entirely of a humanitarian nature, and the desire to solve them arose in the minds of men of sensitive social conscience—pioneers of the "New Humanity"—who had visions of a better social order, in which remedies would be found to heal "the guilt, the ignorance, the physical suffering, the social degradation of the profligate, and the poor."

Now, with the evolution of civilisation to a complex phase of industry and commerce, the problems have become of enormous economic significance. Commerce is maintained between nations by a network of communications on land and sea, which depends for its integrity on freedom from war, pestilence and famine.

So it has come to pass, at the present time, that nations are striving not only for peace and mutual understanding, but also working together in the cause of Public Health for their own interests, and the progress and welfare of the world.

It is a truism to say that "A nation's health is a nation's most precious possession." The modern Public Health Department should be the most powerful and valuable force for individual and social good, and its efficiency the surest index of an enlightened and progressive community.

It is the most fundamental of all Departments of State.

It must bear the responsibility of maintaining an environment fit for the unbroken activities of social life and commerce: it will be called upon to advise on the biological principles that lie at the root of education and labour, which guide the activities of soldiers, sailors, police, engineers, and other public servants, and upon which are based the care of the sick, the control and reform of the criminal. *Report of Commissioner of Public Health, Shanghai, 1923.*

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## Current Medical Literature.

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### INTRACARDIAC INJECTION OF ADRENALIN IN APPARENT DEATH.

A number of extremely interesting reports have recently appeared on the remarkable effect of intracardiac injections of adrenalin in combating heart failure arising as a complication of surgical procedures or in the course of illness.

Bodon reports in *The Lancet*, March 24th, 1923, that a man of fifty-six, who had been waking in the morning with a sense of dyspnea for several days, was found sitting in an easy chair struggling for breath, covered with a cold sweat, cyanotic, and, evidently from his physical signs suffering from dilated heart with all the manifestations of acute pulmonary edema. Full doses of morphine, caffeine and adrenalin given intramuscularly produced no improvement. The peripheral circulation practically ceased, the man became pulseless and was apparently dead, the eyes being widely open and the pupils dilated with absence of corneal reflex; shallow inspiration at long and irregular intervals carried the air only as far as the larynx or bronchi. No pulse could be felt in the radial or coronary arteries. Auscultation of the heart revealed an embryocardia. At this point the respirations ceased completely and the patient passed feces and urine involuntarily. Bodon, therefore, considered that he was probably dead and that no harm could follow an intracardiac injection. The man had an enormous chest with thick walls, nevertheless Bodon thrust his needle through the fourth left intercostal space exactly at the sternal border and it easily entered the heart. He could feel a slight short contraction caused by the irritation of the needle in the heart muscle, and he immediately injected one c.c. of a 1 : 1000 adrenalin solution and withdrew the needle. Within a few seconds a steady improvement of the heart-beat took place, the radial pulse became palpable, respirations set in, the corneal reflex returned, the pupils contracted, and the pallor of the lips disappeared, as did the cyanosis. The patient did not recover consciousness for two hours, and on awakening remembered nothing of what had happened. Two and a half hours after the injection he could walk with assistance a few steps to his bed. Three months later the patient felt perfectly well.

CRILE (DENNIS W.) in *Surgery, Gynecology and Obstetrics* for December, 1922, describes the case of a soldier from whom he was resecting the lower lobe of a gangrenous lung, during the course of which the heart became irregular and then stopped. Massage induced this organ to act again, but erratically, and it

ceased again. Pricking the heart with a scalpel produced a response, but feeble and ineffective. Respirations had ceased and artificial respiration was being carried on, and was continued, together with cardiac massage, for fifteen minutes after the final cardiac failure. Crile states that he then injected directly into the left ventricular cavity 10 c.c. of adrenalin 1:1000 and gave the heart a squeeze, whereupon it began to beat firmly and with greater vigor than it had before. Respiratory efforts were not resumed for twenty minutes, but artificial respiration was continued for twenty minutes, and tracheotomy was then performed and a catheter introduced into the right bronchus. To it was attached a tank of oxygen, which was allowed to flow with sufficient pressure to inflate moderately the right lung. The result of this was that the patient's color became a healthy pink. Twenty-five minutes after the first injection of adrenalin the heart again began to fail by dropped beats and incomplete systole. Ten more c.c. of adrenalin were given intraventricularly, whereupon there was a prompt return to full systole and regularity, followed shortly by efforts at breathing, at first irregular and becoming finally automatic and adequate. He continued to breathe for twenty-five minutes more, when the supply of oxygen failed. He then became cyanosed and the heart-beat weakened somewhat. Six hundred cubic centimeters of blood were transfused, and thereafter the heart, still held in the hand of the surgeon, dilated, fibrillated, and ceased to beat.

A second case is reported in which from five to eight minutes after the last audible or palpable heart-beat 20 c.c. of adrenalin hydrochloride were thrown with an infusion apparatus and washed into his venous system by a flow of saline. The heart began to beat at once, respirations returned, and the patient made a complete recovery.

A further case is reported by Crile as follows: A man of seventy-two years was given spinal anesthesia for the removal of the prostate gland. Cardiac and respiratory failure occurred after about twenty minutes. No heart-beat was palpable, no pulse could be felt, no heart sound could be heard. Artificial respiration was done combined with extra-thoracic cardiac massage for a period of about fifteen or twenty minutes. During this time Crile had made several attempts to puncture the heart, but was not able to aspirate blood, which one does to prove that the heart cavity has been reached before making the injection. He then discovered that the spinal needle which had been used was plugged. Procuring a new needle the intracardiac injection of about 5 cubic centimeters of adrenalin was made and epigastric massage was done. The heart beat faintly at first but stronger and stronger, until the radial pulse became full, hard, and regular. Artificial respiration was continued, and after a while a few respiratory efforts were made.

However, the heart gradually failed again after perhaps twenty-five minutes, and nothing further was done. It is possible that had the intracardiac injection been made within the first five minutes, rather than after twenty minutes of complete cardiac failure, the patient might have recovered.

Exato (*Nederl. Tijdschr. v. Geneesk.*, March 17, 1923) relates that an infant aged 6 months collapsed during general ethyl chlorid and ether anesthesia while an extensive angioma on the forearm was being cauterized. Artificial respiration and massage of the heart for four minutes failed to restore the breathing or heart action. The child was livid, the intensely dilated pupils did not react to light, and dejecta escaped from the sphincters. As a last resort, he injected 0.7 c.c. of a 1 : 1,000 solution of epinephrin directly into the heart, introducing the needle in the fourth interspace, close to the sternum. He turned to lay the needle aside and when he looked at the child again, the livid color had given place to the natural tint, and in a few seconds the heart began to beat forcibly, the pupils contracted, and respiration became regular.

Bodon has been able to collect 90 cases, in which lasting results were obtained in 24, including his own case. The various substances which have been used have been camphor, caffeine, the various derivatives of digitalis leaf, strophanthin, adrenalin, pituitrin, and strychnine. The general conclusion has been that no one of these approaches adrenalin in efficiency, and that it is better, if possible, to get the injection into the left ventricle than into the right. Bodon believes that more than 1 c.c. of 1 : 1000 solution of adrenalin is not only not necessary but inadvisable; nor does he think it advantageous to dilute this quantity with normal salt solution.

The interesting question arises as to how soon after apparent death such injections can be expected to produce results. Admitting that they are not to be resorted to except *in extremis*, it is nevertheless believed that they may be efficient as long as five or ten minutes after death has apparently occurred. Later than this the failure of the circulation has produced such changes in the brain and spinal cord that recovery is impossible.

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#### **PRESENT METHODS OF RECOGNIZING THE ANATOMIC NATURE OF KIDNEY DISEASE.**

SCHLAYER, *Deutsche med. Wochenschr.*, February, 1923.

In a postgraduate lecture on diagnosis of kidney diseases Schlayer says that albuminuria may be absent in certain stages of some kidney diseases, and tube-casts have been found in healthy athletes. The waxy tube-cast is generally a sign of dyscrasic influence and is often found in amyloid nephrosis, nephrosis, and pseudo-nephrosis. The presence of erythrocytes is of greater im-

portance, as they indicate irritability, especially of the vessels. Chronic glomerular nephritis with edema is not always accompanied by high blood pressure. Hypertension may have other causes than renal disturbance, but the possibility of kidney disease should always be remembered. The form and fulness of the pulse should be noted. An overfull pulse is found mostly in benign arteriosclerotic diseases; strong pulse with fulness in severe arteriosclerotic contracted kidney. The composition of the urine after test meals should be carefully noted, as the relation between the anatomic nature and the condition of the functioning of the kidney is most important. The functioning of the kidney may be independent of the anatomic nature of the disease, and the changes may be the same in fundamentally different diseases. There is no fixed relation between diffuse affections and functional changes. High blood pressure (without other cause) accompanies acute and chronic parenchymatous disease of the kidneys only when severe, and not always then. Anatomically similar injuries may express themselves in different functioning.

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#### RECTAL INJECTION OF ETHER IN CHILDBIRTH.

THALER AND HÜBEL, *Zentralbl. f. Gynäk.*, March, 1923.

The results in 100 cases of childbirth in which a mixture of 90 gm. of ether and 120 gm. of olive oil was employed are reported. In 88 cases the results were very satisfactory, and in only 4 cases did the method prove an absolute failure. In 80 of the 100 cases normal or very strong labor contractions were noted. In some cases the labor seemed to be even improved by the injection of the ether-oil mixture. In the other 20 cases labor was reduced by the injection. In these cases, quinin or pituitary extract was used as an adjuvant, mainly in order, by shortening the duration of the birth, to lessen the consumption of ether. The average duration of the birth was for the 73 primiparas  $20\frac{3}{4}$  hours; for the 27 multiparas,  $10\frac{1}{4}$  hours. In all cases in which the sleep was profound, the women did not strain, and consequently the expulsion period was no doubt prolonged. No anomalies of the afterbirth period were observed; 84 of the children were in normal condition at birth and cried immediately; 14 were apneic for a short time, though they looked well and began to breathe normally at the end of five minutes, at the most, without any special attempts at resuscitation being necessary. In 2 cases the infants were suffering from typical asphyxia. Of these, one (a spontaneous birth) was revived in a short time; the second (a forceps delivery) could not be resuscitated. In the majority of cases, during the intervals between labor contractions the patients lay as if asleep, but during the labor contractions they were slightly restless and would groan occasionally. As during twilight sleep, the women received physical

impressions but could not retain them in the memory. Ether-oil injections should be given only in hospitals where the patient can be under constant observation and any emergency promptly met.

#### **DUBLIN METHODS IN TREATMENT OF ECLAMPSIA.**

*Brit. Journ. of Obstet. and Gynaecol., 1922, p. 402.*

In a paper of which one of the objects is to emphasize the grouping of pregnancy albuminuria, hyperemesis, neuritis, accidental haemorrhage, and eclampsia as conditions of one and the same disease (toxaemia of pregnancy, with differing clinical pictures, of which albuminuria is the only universal symptom), G. Fitzgibbon describes the treatment carried out for toxaemia and eclampsia at the Rotunda Hospital in Dublin.

The patient is kept in bed and given continued purgatives (3 oz. doses, two or three times daily, of *mistura sennae co.*, with *mag. sulph.* 1 drachm to 1 oz.). Enemata are given at the beginning of the treatment if the bowels have not acted for some time. No food, but at least 6 pints of water are given daily; when the symptoms have abated and the urinary secretion is at least normal in amount, milk is added gradually to the diet. If the patient does not respond, or relapses, or if the foetus is dead, labour is induced; this, however, was only necessary in 5 of 40 cases, and then not before the eighth day of treatment. In cases characterized by much vomiting, this treatment is modified by withholding fluid by the mouth for from twenty-four to forty-eight hours and by giving frequent enemata, colonic lavage if the enemata are not effective, and submammary infusions of sodium bicarbonate solution if the symptoms are severe; purgatives given orally can always be retained at the end of forty-eight hours. These lines of treatment are those adopted for pregnancy toxaemias, for pre-eclamptic states, and for eclampsia when the patient is sufficiently conscious to be able to drink.

In a comatose eclamptic subject the stomach is washed out with sodium bicarbonate solution, of which about 15 oz., together with 4 oz. of *mist. sennae co.*, are allowed to be retained. Through a long tube introduced per rectum into the colon (a procedure which is often difficult, and may take as long as two hours) irrigation with soapy water is carried out until the bowel contents appear in and then disappear from the washings; 8 or more gallons may be required. The irrigation is continued with sodium bicarbonate solution, and 2 pints are left in, with 4 oz. of *mist. sennae co.* This is repeated at five-hourly intervals until the patient is sufficiently conscious to drink, or until the bowels act spontaneously; the toxaemia treatment is then continued. If labour sets in it may be completed when the presenting part reaches the perineum;

otherwise it is not interfered with, nor induced when not present. The comatose patient is kept on her side, is given large poultices to the loins in most cases, and may receive submammary infusions of sodium bicarbonate.

This treatment is substantially that introduced by Hastings Tweedy in 1903, modified by reduction of the amount of morphine given, which in the latest cases has frequently been *nil* and has not exceeded  $1/2$  grain. The twenty years' 214 consecutive eclamptic cases have shown the exceptionally low mortality of 8.87 per cent. BETHEL SOLOMONS (*Ibid.*, p. 416) describes a similar treatment. He emphasizes the importance of careful watching in an adequately lighted room, by a skilled observer, of the comatose patient; mucus may be swabbed out from the throat from time to time, and the patient's head and shoulders made to hang over the side of the bed with the face down. He advises routine injection of sodium bicarbonate solution under the breasts in all but the mildest cases.

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#### AN OBJECTION TO THE POISONING OF RATS AS A MEASURE AGAINST PLAGUE

*Jour. Am. Med. Assn.*, May 1923.

In the *Times*, an Anglo-Indian official, Mr. Walter Saise, points out the danger of poisoning rats as a measure against plague. A rat from a plague-infested house is a source of danger when it dies, as the rat fleas leave the cold carcass and search for another warm-blooded host. Before it dies, the plague rat is not a source of danger, as the fleas prefer it to another host. In a successful campaign against plague on the East Indian Railway Company's colliery estate in Bihar in 1904 and 1905, Mr. Saise declared that rewards would be paid only for live rats. Rat traps were served out to all the miners, who were promised one anna (two cents) for each rat caught. They were further told never to kill rats, or to handle any dead ones they might find about their houses. The miners or their children brought the traps, often quite full, to the collecting stations. The cages were immersed in a weak mercuric chlorid solution until the rats were dead. This procedure both drowned the rats and disinfected the cages. The cages were then shaken over small wooden boxes partly filled with jute waste. The dead rats fell into these boxes, and the fleas could be seen snuggling into the dry jute. The box, with rats and fleas, was placed on a shovel and thrown into the furnaces of the colliery boilers. The result was that the plague was stayed. In a population of 12,115, there were only seventeen deaths.

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## Book Reviews.

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**The Bacteriophage.**—Its Rôle in Immunity. By F. d'Herelle, Pasteur Institute. Authorized translation by George H. Smith, Ph. D. Assistant Professor of Bacteriology and Pathology, Yale University, School of Medicine. With Fourteen Text Illustrations, Publishers: Williams & Wilkins Company, Baltimore, U.S.A., 1922.

The doctrine of the bacteriophage enunciated by Dr. d'Herelle of the Pasteur Institute, Paris, is one of extraordinary interest, and, if proved, will be of great significance in problems of microbiology, pathogeny and immunity.

The fact that filtrates from organic material can induce rapid lysis of bacterial cultures is beyond dispute, and was described two years previously by Dr. Twort, of the Brown Institution, London. He did not, however, venture to define the nature of the lytic agent.

The interpretation of this phenomenon has given rise to keen discussion among the most distinguished bacteriologists of the day.

It cannot be said that the conception of ultramicroscopic parasites of bacteria which cause bacteriolysis, has yet passed from the region of hypothesis into that of proved fact.

There are strong arguments in its favour, and also in favour of other conceptions, as for instance, that propounded by Professor Bordet, of a microbic transmissible autolysis brought about by chemical substances excreted by the bacteria themselves.

Before the truth is known further research is necessary by workers in all branches of biology, especially in bacteriology and biochemistry.

Dr. d'Herelle's book gives a full record of minute and exhaustive work on which he based his brilliant conceptions of the bacteriophage, and will be read with intense interest by all concerned with the more subtle and complicated aspects of microbiology.

His explanation of the part played by the bacteriophage in immunity is ingenious and fascinating, and if proved, will profoundly influence the modern practice of Preventive Medicine.

The translation by Professor George Smith of Yale is worthy of the style and lucidity of the original.

C. NOEL DAVIS.

**The Operative Treatment of Glaucoma.** By H. Herbert, F.R.C.S. Eng. Lieut.-Col. Indian Medical Service, retd. Price 10/6. Publishers: Bailliere, Tindall & Cox. 8 Henrietta Street, Covent Garden, London. 1923.

The author has had a great deal of ophthalmic experience in India, and is now connected with various ophthalmic hospitals in England. He states that at the present time the variety of operations practised for the relief of glaucoma is far greater than ever before, showing the general feeling of uncertainty and unsettlement resulting from dissatisfaction with modern treatment. For instance, the results of the classical iridectomy in glaucoma have hitherto been most disheartening, at any rate in India. It is his opinion that, judging by present evidence, properly guarded iris-impaction appears to hold out the greatest promise as our safest, as well as our most effectual, means of dealing with the more severe and advanced

glaucomas; and in Egypt, India, and the East generally, treatment by iris-inclusion might apparently with advantage become at once the routine practice for the great majority of primary glaucomas.

To the author the advantages of this operation, soberly presented, appear overwhelming. Some of the drawbacks are comparatively trivial; the others, in effect, merely render certain ordinary precautions more essential—precautions frequently somewhat neglected. The whole subject is very fairly discussed. The advantages are (1) relative certainty of relief, with no risk of serious hypotony; (2) permanence of relief; (3) probably complete safety, with due care; (4) exceptional ease of technique, suited to beginners.

The drawbacks are (1) some enlargement of pupil; (2) a little astigmatism produced; (3) pigmented scar-line, with some conjunctival elevation for a time; (4) suitability for cases with extremely contracted fields of vision not yet proved; (5) possible delay in re-establishment of anterior chamber; (6) an increased risk of early infective complication, including sympathetic ophthalmia, as compared with operation not involving the iris, if due precautions are not taken.

The book is recommended to all ophthalmic surgeons. As the author says, even the most convinced opponents of some of his work may find useful information in this record, much of which applies to glaucoma treatment in general.

**Nursery Guide for Mothers and Nurses.** By Louis W. Sauer, M.A., M.D. Illustrated. Price, G.\$1.75. Publishers: C. V. Mosby Company. St. Louis. 1923.

In clear, concise form, the author gives directions for the care and feeding of infants with a description of their common complaints and the necessary treatment until the physician takes charge. The book may be given with confidence to mothers, nurses and others entrusted with the care of children.

**Diseases of the Skin.** A Manual for Students and Practitioners. By Robert W. MacKenna, M.A., M.D., B. Ch., (Edin.). With 166 Original Illustrations in the Text and many Formulæ. Price 21/net. Publishers: London Bailliere, Tindall & Cox. 188 Henrietta Street, Covent Garden, London. 1923.

The author has written a very clear, readable book, for students who demand a concise yet adequate description of diseases of skin with instruction in differential diagnosis; and for practitioners who expect plain and dogmatic directions as to treatment. Each of these needs is well met, all the latest advances in this branch of medical science receiving proper consideration. The chapter on focal infections and sensitization to proteins is short but satisfactory. He admits the necessity of dealing radically with septic infection of teeth and tonsils but he gives a word of caution. "More than one sound tooth has been sacrificed vicariously on the altar of focal sepsis, and I have seen one unfortunate patient who had all his teeth removed, in a vain attempt to cure a skin condition that was due entirely to an external cause."

As to the treatment of leprosy by the esters of chaulmoogra oil the author is hopeful yet cautious. "So it would appear that at long last therapeutic science offers a ray of hope to the leper. In judging of improvement, however, we must not forget that large leprous infiltrations may disappear spontaneously without breaking down, and, in the light of

past experience, one must not be too ready to ascribe ameliorations entirely to treatment. One must wait longer before one can state definitely that leprosy is a curable disease."

The problem of classification has not been solved. As far as possible the author has adopted a classification based on etiology, but where the causal factor is undetermined he follows clinical appearances, or groups the diseases according to the particular structure of the skin affected, such as the sebaceous glands. The illustrations are numerous and good.

**The Journal of Medical Missions in China**—Official Organ of the Medical Missionary Association of India. Vol. XXIX. No. 113. April, 1923.

All medical missionaries in the East should be interested in this Journal, which has been recently much enlarged. It will continue for this year, at least, as a quarterly. It is published by the Scottish Mission Industries Co., Poona, and now contains sixty-five pages of matter, in addition to advertisements, clearly printed on good paper, in an attractive, simple form.

The contents will hereafter include articles and reviews on Surgery, General Medicine, Tropical Medicine, Eye Diseases, Obstetrics, Tuberculosis and Public Health, edited by a corps of assistant editors. Mission Hospital Reports, Letters, Symposiums, Statistical Statements, Editorials, and Extracts from Current Literature will also be given place. No effort will be spared to make this, the organ of the Medical Missionary Association of India, a progressive and representative Journal. It is hoped that every medical missionary will be a supporter by subscribing to the Journal and contributing to its contents; the cost of a year's subscription is \$1.25 or 4s. 6d.

**Dental Surgery and Pathology.**—By J. F. Colyer, K.B.E., F.R.C.S., L.D.S., Fifth Edition, with 6 plates and 951 Illustrations. Price 32/-net. Publishers: Longman's, Green and Co. 39 Paternoster Row, London, E. C. 4; New York, Toronto, Bombay, Calcutta and Madras. 1923.

In all diseases and abnormalities of the teeth and jaws the surgeon and dentist will find this volume an instructive and reliable guide. It is clearly written and well arranged. In the process of a thorough revision an endeavour has been made to increase its usefulness without adding to its bulk: with this object in view, the description of the technical details of the insertion of fillings has been omitted, while considerable additions have been made to the sections dealing with the pathology of irregularities in position of the teeth, and the morbid anatomy of diseases of the periodontal membrane; similarly, the chapter on Bacteriology has been omitted, and additional chapters have been inserted dealing with Local Anæsthesia and the Interpretation of Dental Radiograms.

Throughout the work the influence of septic conditions of the teeth on other pathological processes is kept in view. Of course very many pathological conditions are attributed to septic processes in the mouth, but the author is judicious and does not expect that extraction of teeth will in every case restore the patient to health. "I desire to lay special stress on this because at the present time, patients are often induced to part with their teeth on rash and unwarranted promises of a complete recovery from the general condition, whatever it may be, which is affecting their health." The work is well illustrated as it has six plates and no less than 951 other illustrations.

**The Form and Functions of the Central Nervous System.**—An Introduction to the Study of Nervous Diseases. By Frederick Tilney, M.D., Ph.D., and Henry Alsop Riley, A.M., M.D., Foreword by George S.

Huntington, Sc.D., M.D., Professor of Anatomy, Columbia University, New York City. Second edition; 591 Figures containing 763 illustrations of which 56 are colored. Price, G. \$12.00, Publisher: Paul B. Hoeber, New York. 1923.

In an interesting foreword to this fine work, Dr. G. E. Huntington, the well-known American anatomist, refers to the advanced policy in medical education recently adopted by the University of Oregon which is bringing together in one course the premedical and medical years so as to obliterate the divisions commonly existing between premedical, preclinical, and clinical studies. This movement is based on the cardinal fact that morphology, physiology and bio-chemistry underlie all sound ideals of medical education. Consequently, there should be no gap between the teaching of primary branches of medical science and instruction in clinical medicine; all should be closely connected. This is of great advantage to the student as it makes his studies far more interesting; it is also advantageous to the teachers as it induces them to realize the importance of utilizing the three clinical factors of injury, disease and variation as invaluable experimental illustrations, illustrating the significance of the structural, functional and chemical facts with which they are primarily concerned. The method is particularly useful in the study of the nervous system, which, as pure anatomy, is extremely dry and intricate; illustrated by clinical cases it is of absorbing interest. The authors have been guided by this conception. As stated by them, their "work is designed to fill the gap between morphology and the practical requirements of clinical medicine. It aims to visualize the living nervous system, to make accessible an appreciation of its vital relation to the functions which go to make up life, as well as the defects in these relations which result in disease."

The authors have succeeded admirably in their task. After chapters on the importance and significance of the central nervous system and its embryological development, there is a separate study of each part from different points of view, and the functions are elucidated by case histories with pictorial illustrations. For example, in connection with the anatomical study of the spinal cord, there is a discussion of the syndromes of lesions of the gray matter—the ventral gray matter, the dorsal, and the gray commissure. The study of the syndrome of the gray matter opens with a case history, there is next a careful scrutiny of the condition of the motor and sensory components of the nervous system, and this is followed by the interpretation of the symptoms and anatomical analysis, the pathology and diagnosis (acute anterior poliomyelitis), nomenclature, variations in onset, course and duration of the disease, and a summary. This method is practically followed throughout, and thus anatomy is made clear and interesting to the students and the foundations are laid for the correct interpretation of the symptoms of disease. The illustrations are numerous and excellent. The whole work, as Dr. Huntington remarks, is the product of ripe American scholarship and training. It is heartily commended to students; also to physicians, as it has been estimated that from fifty to seventy per cent of their work is concerned with diseases of the nervous system.

**The Caduceus.**—Journal of the Hongkong University Medical Society, Vol. 11, No. 2, May. 1923.

The Caduceus is steadily increasing in size and strength; no longer is it an infant publication. In the present number, Dr. Wan has an article on the use of Diathermy in Medical and Surgical practice; Dr. Yeoh describes a medical campaign against frambœsia in Malaya; Dr. Shellshear writes

an instructive article on the distribution of the blood vessels in the body from the point of view of the very remarkable way in which they are related to the functions of the parts to which the vessels are supplied. He makes anatomy very interesting. For instance, in alluding to the problem why a particular poison should select a particular area, and why in lead poisoning certain groups of muscles are much more often involved than others, he suggests that the facts of their blood supply may help towards the elucidation of these and other problems which are so often dismissed with such vague statements as "the tissues of the region have a peculiar susceptibility to this or that type of poison," as such statements do not give any real explanation. Dr. Heanley takes his students afield to study geology in the neighborhood of Hongkong and Dr. Earle has a pleasantly written article giving his impressions of the recent Conference of the C.M.M.A., in Shanghai. In connection with the proposal to broaden the basis of membership in the C.M.M.A., he writes, "By opening wide its membership to all Western trained physicians there is no doubt that the Association will be able to exert a wider influence than before and will be able to prevent the spread of a commercialism in medicine which is contrary to its best traditions."

"The fact that Western medicine has been introduced into China by Christian missionaries is one upon which China may well be congratulated. For although Western medicine at the present day in Europe and America is not distinctly Christian, it must not be forgotten that practically all the most ancient hospitals and medical schools in London and elsewhere owe their existence to Christian foundations, and in many cases are named after Christian saints. Further, Christianity has played an important part in establishing the code of ethics which the best Western physicians instinctively obey. There is a great danger in introducing Western medicine into a country in which material standards are paramount, and even in Europe and America to-day there is a great danger of the profession of medicine becoming commercialised."

"While it is not possible, however, for all Western physicians to accept the complete Christian and therefore missionary position, it is possible for them to accept the medical ethic which has grown from the contact of medicine with Christianity, and it will be possible by widening the scope and title of the Association to include many who will work for the spread of the best medical traditions and who will fight against any breach of sound ethical principles."

Abstracts from current medical literature, with editorials, news and comments, complete a very interesting number.

### REPRINTS:

CARDIAC EFFICIENCY TESTS.—By W. W. Cadbury, M.D., Canton Christian College, Canton. *Medical Times*, July, 1922

ANOPHELES MOSQUITOES.—With special reference to the species found in Siam. By M. E. Barnes, M.D., *Journal of Nat. Hist. Soc., of Siam*, May, 25, 1923

REMARKS ON YELLOW FEVER.—By Dr. F. Castillo Najera, of Peking. A paper read before "The Faculty Medical Society," of the Peking Union Medical College.

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## NEWS AND COMMENT.

AT the American Consulate General, Tientsin, on Monday, Miss Helen Vincent was married to Dr. Franklin C. McLean, both of the Peking Union Medical College, Peking. The Rev. C. A. Stanley officiated.

**DEATH :—Merwin.**—On July 8, 1923, at the Faber Hospital, Tsingtao, Dr. Caroline Stowe Merwin, of the A. P. M. Tsinan, of acute pericarditis. San Francisco and Portland, Ore., papers please copy.

**DR. A. P. Peck.** of the A. B. C. F. M., died in Berkeley, California, on June 15, 1923. Dr. Peck was 74 years old and lived in China, mostly in Shantung, from 1880 until 1919, when he retired from his medical practice in Tientsin at the age of 71.

**FINANCIAL COST OF MISSIONARY WORK.**—At a conference of the British Missionary Societies at Swanwick, Mr. Kenneth MacLennan, the secretary, said that America was bearing the predominant burden of Christian missions to China, contributing nearly £2,000,000 a year to them as compared with £325,000 from Britain.—Reuter.

**FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE.**—Dr. W.S.A.E. Horn, President-elect of the approaching Congress in Singapore, having accepted the appointment of Medical Secretary to the Colonial Office, London, is unable to act as President, so that a further election is necessary, which will be held when the Congress opens.

**PRE-MEDICAL EDUCATION IN CHINA.**—Offers were made by the China Medical Board of the Rockefeller Foundation during 1922 to two Chinese institutions, South-eastern University, Nanking, and Nankai College, Tientsin, and to the

missionary university in Peking, to contribute toward science laboratories and equipment, to lend visiting professors, to grant fellowships for further training of Chinese teachers and to add to maintenance funds.

**HYGIENIC REFORMS AMONG MOHAMMEDANS.**—Dingizli (*Bull. de l'Acad. de Méd.*, February 1923) shows that it would be comparatively easy to introduce hygienic measures among the Mohammedan population, because their ritual contains similar requirements. Two of his quotations from Mohammed are interesting: "The study of the science of the human body shall be given the preference over the study of the religious sciences." . . . "If it were not for that fine dust which we see floating in the sunbeam, and if it were not for the danger from stagnating waters, Adam's son would live ten centuries." The use of alcohol, hashish and opium is widespread among the natives. Being a native himself, Dingizli asks for the prohibition of their manufacture and importation, and especially for laws against the sale of all intoxicant drugs to natives.

**UNION MEDICAL SCHOOL FOR WOMEN, SHANGHAI.**—The American Section of the Board of Directors have authorized the China Section of the Board of Directors to proceed at once with the erection of the Belle H. Bennett Memorial Building, so that it may be ready for use by the Chinese New Year, 1924.

**SCIENTIFIC MEDICINE IN CHINA.**—Hospitals well equipped, adequately staffed, and advantageously located are essential to the introduction of modern medicine in China. Many missionary hospitals and a few under Chinese control are serving the cause not only by caring for

patients, but by raising the professional and ethical standards of Chinese practitioners, and by educating the Chinese public in the meaning of scientific medicine. To come into closer and more sympathetic relations with the public, the Peking Union Medical College has recently appointed a cooperating committee of prominent Chinese to aid in interpreting the College to the community.

**HEALTH CAMPAIGN IN CHANGSHA.**—Dr. F. C. Yen writes that the Health Exhibit and Lectures on Health were, as a whole, a great success. Some thirty thousand men attended during the five days when the campaign was on. Unfortunately in the midst of the campaign the entire city was inflamed through the killing of two Chinese and wounding of ten others by the sailors from the Japanese gun-boat. This is the second big health campaign conducted in Changsha. The first one was held in 1915. There is now a Hunan Branch of the Council on Health Education.

**HOOKEWORM DISEASE AS AN EDUCATOR.**—The relief of a disabling malady prevalent throughout areas inhabited by nine hundred million

people of the world, is sufficiently important in itself. But the control of hookworm infection has another and even more significant value. It is an effective means of educating people in the meaning of public health work and of persuading them to support more comprehensive measures of preventing other diseases as well. For the facts about hookworm disease are fairly simple and easy to understand. . . . Experience with anti-hookworm campaigns in many countries has proved that the disease can readily be used as a means of educating the public in the possibilities of preventive medicine.

**SANITATION IN CANTON.**—Dr. W. W. Cadbury, of the Canton Christian College, Canton, has an instructive article in the *Plumbing and Heating Magazine* (Philadelphia, U. S. A.), September, 1922, on Chinese life in Canton with a description of its sanitary problems. Apparently detailed information concerning the Chinese people is still necessary. "The familiar Chinese laundrymen of our American cities learned their calling after coming to this country (U. S. A.). It is a mistake to think that all Chinese are laundrymen at home."

## 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*

### The Treatment of Sprue.

Sprue is a dread disease, not uncommon disease among foreigners who live in the Far East. Quite a number of physicians have been attacked by it. The etiology has not yet been fully ascertained. Dr. C. L. Bartlett, of the Peking Union Medical College, is investigating the problem and has sent out a questionnaire asking for information concerning cases which have occurred within the last ten years. An article on the treatment of the disease, by H. Harold Scott, M. D., M. R. C. P., will

be found in the present number of the *Journal* (*ante*, p. 581). Dr. G. Duncan Whyte, one of its victims, in a letter to Dr. P. B. Cousland writes very hopefully of this treatment. Dr. Cousland has kindly forwarded the letter for publication with a note of his own.

*To the Editor, C. M. J.,*

DEAR SIR.—In a recent letter describing the successful treatment of Sprue, Dr. G. Duncan Whyte of Swatow, asks me to spread the good

news in China and Korea. The letter is so graphic that I feel sure he would not object to its being published in its original form.

After he had faithfully tried treatment at Swatow, Shanghai, and Hongkong, Dr. Whyte went home last summer with rather acute sprue of five months standing accompanied with marked anemia. He writes :

"Dr. Scott (Government Bacteriologist, Hongkong) suffered from sprue for about two years in Hongkong in spite of careful dieting. He went to Vancouver, where he went on relapsing. When he got to England, under the best tropical specialists and most careful dieting the same alternation of relapses and arrests continued till he was "dropped" from the Colonial service.

He then began to take himself seriously. Why do cases improve with milk diet? Why do cases improve with "Shanghai Peter's" powder? The common element, obviously, was calcium. But it has been shown that this is valueless (relatively, at any rate) unless given along with parathyroid gland (see especially Vines' work at Cambridge.) He found also that the blood of sprue patients was very poor in calcium (though there seems to be room for doubt as to the reliability of the various methods of making this determination.) Within a few days of starting the parathyroid and calcium treatment [parathyroid (prepared by Armour or Parke Davis & Co.,) grain one-twentieth, with calcium, either the chloride or lactate, grains fifteen, given twice daily], Scott began to improve; later he absolutely disregarded all dietary regulations and showed no ill-consequences. He is now just as keen a 'demon for work' as he used to be and has a totally different look."

Mention is then made of the case of a young missionary from South China about to be dropped by his mission on the recommendation of two leading tropical specialists when Dr. Whyte persuaded the physicians to try this new treatment. He is

now eating anything and is asking for more deputation work. The letter continues, "When I left Hongkong I was taking not more than two pieces of untoasted bread a day, and only a limited amount of toast, biscuits etc. When near Japan I could take pastry (veal and ham pie, apple tart, etc) with impunity and then tried boiled suet pudding. This was too much for me; it sent me back again to sore mouth, flatulence and loose stools. Apparently after two or three months at home my capacity for dealing with fats and soft carbohydrates was just as limited as before—say two pats of butter, but neither ham nor bacon. Once I tried a couple of fat ham sandwiches and I was bowled over in a few hours. A few days after beginning Scott's treatment I had fat pork for lunch, large, thick slabs of it, followed by boiled 'rolly-poly pudding' and did not turn a hair! Now I eat everything and my weight has gone up 14 pounds. Scott himself, I believe, has stopped treatment for two months now and continues to enjoy the full sort of diet I have indicated. When I get back to my own home and a settled existence I will stop the parathyroid and calcium too. Theoretically the calcium is supposed to be necessary for the development of secretin from secretogen, or for the production of some hormones required for the production of pancreatic juice. Functional test (levulose) shows that the liver is not impaired."

I have met cases where the yellow santonin treatment had produced like remarkable results, but in my own hands and those of many others it has been practically valueless. It remains to be seen how many of the group of cases classified as sprue will respond to this new treatment. As Dr. Whyte says, "the proof of the pudding does not rest on theoretical considerations, but on demonstrable results."

Your sincerely,

PHILIP B. COUSLAND.

Japan, June, 1923.



