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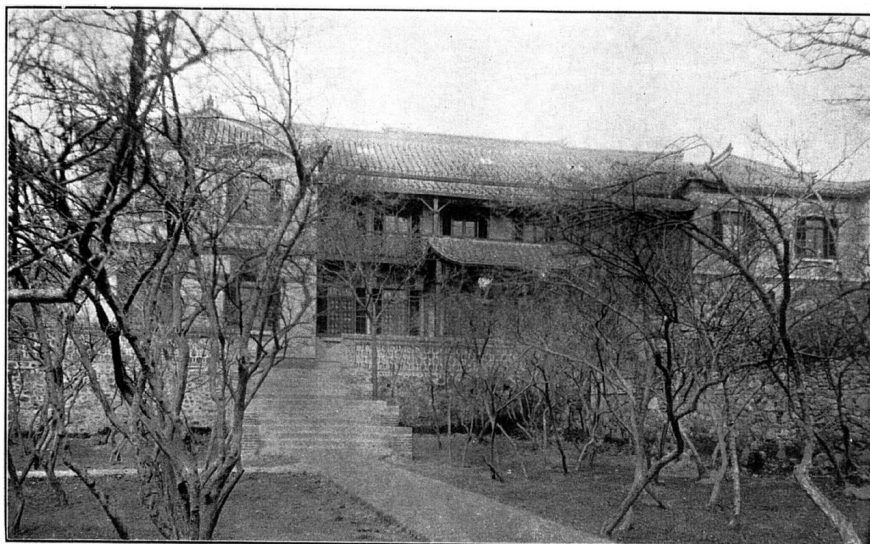
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ANKYLOSTOMYASIS.

By GEORGE A. HUNTLEY, M.D.

Some of us remember with a tinge of sadness how in the earlier days of our work we were confronted with patients suffering from profound anæmia whom we treated with hæmatinic remedies but without success. None of us dreamed that many of those cases were due to an intestinal parasite, and it never occurred to us to examine the feces in order to find out the cause of the serious symptoms.

To-day, however, when a patient presents himself with a profound anæmia and especially if in addition he complains of epigastric distress and passing of blood at stool, we feel something like a thrill of satisfaction as we remember that here probably is one of the very few diseases for which we possess a specific remedy. Patients presenting themselves at the dispensary with such a combination of symptoms should be urged to enter the hospital for diagnosis and for treatment, should the case prove to be one of ankylostomyasis.

The discovery of the hookworm is now ancient history. In 1782 a German zoologist named Goeze found a thread-like parasite in the alimentary tract of a badger which he was dissecting, and in his description he mentions some finger-like rays in the caudal expansion of the male parasite which he supposed to be hooks; seven years later Froelich discovered a similar parasite in the intestine of a fox, and observing the hooks (as he supposed them to be) described by Goeze, he named the parasite *haakenwurm* (hookworm), and the genus he named *uncinaria* (from *uncinus*, a hook). The so called hooks, however, we now know were not hooks at all but rib-like supports for the expanded membranous tail of the parasite. The word "hookworm" has, how-

ever, been retained because of the shape of the worm being bent like a hook and more especially on account of the three pairs of hooklike teeth in the oral cavity of the ankylostomum duodenale.

The relation between ankylostomun duodenale and anæmia was not suspected until 1879, when what was known as tunnel disease broke out among the excavators in St. Gotthard's tunnel. Sanitary arrangements and personal hygiene seemed to have received no thought from the authorities, and the soil on which the men worked was found to be teeming with the ova and larvæ of the ankylostomum duodenale. As soon as the presence of the parasites was demonstrated amongst those workers, investigators from various parts of the world soon sent in reports showing how very widespread the parasite was, from Calcutta to Cape Colony and from Egypt to Japan. It has since been estimated that one-third of all the deaths in Porto Rico is due to it.

That this parasite is very prevalent in China is shown by the recent report of the Research Committee of the C. M. M. A. of 934 patients treated during two and a half years in the Hanyang Hospital; 24 or more than $2\frac{1}{2}$ per cent. were found to be infected by ankylostomum duodenale. If it had been possible to examine the feces of all the patients who enter the hospital, doubtless the percentage would be much higher.

The delicate ova of the ankylostomum duodenale cannot be easily found in a thick specimen of the feces. Better results will be secured from washed than from direct specimens. Even then the sediment taken will sometimes be too thick. Some recommend that this be washed with a solution of calcium chloride. I have never tried it, but have got quite satisfactory results by pouring off the clear fluid in the centrifugalizing tube to within an inch of the bottom, stirring the sediment with the remaining clear fluid and examine. If a drop or two of a solution of methyl blue be added to the specimen nearly everything excepting the ova of ankylostomum duodenale will be stained, while the ova will be a conspicuous white. After a while the stain will enter the thin shell, but the segments inside the egg will remain colorless.

Although thousands of these eggs are deposited in the intestinal canal, they cannot develop without oxygen, so do not, like bacteria, develop in the bodies of their host. After being passed with the feces they take about three days, rather less in hot and more in cold weather, to hatch into minute larvæ. The hatching process can easily be watched under the microscope by using the warm stage. If suitably supplied with moisture heat they grow a new skin inside the old one,

which is molted. Later the larvæ molt a second time, but then the skin is not cast off as it was the first time, but forms a protecting sheath for the larvæ. At this period of its development it reaches the infective stage and the little parasite is ready to fasten on to any foot or hand that may come in its way, or be conveyed to the alimentary tract in drinking water or with raw vegetables. Failing entrance to some victim at this time it dies.

The knowledge of the way in which the larvæ enter the human body we owe to Loess, a German investigator. While experimenting with a number of hookworms in the infectious stage he accidentally allowed a drop of water containing the larvæ to fall on the web between two of the fingers on his left hand. He soon noticed a sensation of tingling and burning at the site of the accidental application. He then applied another drop of the infected fluid on the back of his hand and noticed that in a very short time nearly all the minute parasites had penetrated through the skin and left their sheaths behind them. After 71 days Loess found himself suffering from anæmia and debility and discovered the ova of the hookworm in the feces. The experiment was repeated on another man who offered himself for the purpose, and the results were exactly the same; the ova were found in the stools precisely 71 days after the infection.

The next experiment of this careful investigator was upon a lad, whose leg was about to be amputated. An hour before the operation a place on the leg was selected and carefully scrubbed with soap and water and a drop of water containing the larvæ was placed upon it. After ten minutes the spot was quite dry; there was no redness. The leg was then amputated, and the skin upon which the experiment had been performed was carefully dissected out, hardened in alcohol and section cut in the usual way.

On microscopical examination it was found that the larvæ had entered the skin through the hair follicles chiefly, though some had entered through the sweat glands. Some larvæ had penetrated deeply into the skin whilst others had their heads in the mouth of the follicle and their tails still outside.

Now comes the interesting question, After penetrating the skin how do these larvæ enter the intestinal tract? Loess discovered the mode of entrance by experiments on humans, but after this he continued his investigation by experiments on young dogs and cats. Repeating his former experiments on these animals he found again that the larvæ entered the skin through the hair follicles, and by killing the animals at various intervals he was able to follow the journey of the parasites

through the various structures. From the hair follicles it was found that the larvæ entered the cutaneous veins and were carried by the blood stream to the heart. From thence they were carried to the lungs, and many made their way up through the trachea down through the œsophagus into the stomach, where after a few days they were found to develop their well armed mouth capsule.

During this novel journey many of the larvæ succumb ; some pass into the lymph glands, where they are attacked by the phagocytes and destroyed, while others become imbedded in the mucous membrane of the trachea, where they probably die. It is interesting to observe that in the lungs of all the dogs experimented upon minute hemorrhagic spots were discovered, and as some observers have noticed that the death rate from tuberculosis is double in those infected with ankylostomes as compared with those not so infected, it is quite possible that an etiological factor may be found in the migration of the larvæ through the lungs, though of course the attending debility and anæmia has probably something to do with it.

I will now give reports of a few of the cases treated in the Hanyang Hospital and conclude the paper with a few remarks by way of summing up the symptoms and treatment.

CASE 1.—Ho Chong-ts'ao. Resident at Kingcheofu. Male. Age 38. Tailor. Admitted May 12th, 1907.

Came in for treatment for hemorrhoids, which were relieved by operation. He continued, however, to pass blood by the stools, and was profoundly anæmic. Microscopical examination of feces revealed in one slide the following ova: *Ascaris*, 17, x 1; *ankylostoma*, 5. There was slight elevation of evening temperature. Treatment was by eucalyptus, chloroform and castor oil. Further examination of feces revealed no ova. Patient discharged June 6th, 1907, being under treatment less than a month, quite well.

CASE 2.—June 21st, 1908. Name Chu. An accident case from the Arsenal. M. Age 18. On account of extreme pallor the feces were examined and found to contain *ankylostomum duodenale*, *tricocephalus dispar* and *ascaris lumbricoides* in large quantities. Evening temperature slightly elevated. After treatment by santonin the patient was prepared in the usual way, viz., put on liquid diet for two days with brisk cathartics, preferably calomel and soda, followed by sulphate of magnesium. No food given on morning of the third day, when one drachm of liq. ext. of male fern was given, which was repeated two days later. Each dose of male fern was followed by castor oil. Forty-

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nine ankylostomes were found in the feces. Further examination of the feces revealed no ova. Discharged July 5th, 1908. Under treatment fourteen days.

CASE 3.—Name Cheo. Admitted July 2nd, 1908. My notes of the symptoms of this case are lost, excepting that the evening temperature was slightly elevated and the hemoglobin registered on entrance 30 per cent. The preparatory treatment was as usual. The anthelmintic prescribed was the eucalyptus mixture already referred to, and was given on four successive mornings. The first administration was on July 3rd. On July 5th, 206 parasites were found in the feces: on July 6th, 230; on July 7th, 14, and on July 9th, 1, or a total of 451.

On July 15th, there was considerable tympanitis, relieved by turpentine stupes, also there was considerable œdema of both legs. The hemoglobin, which was 30 per cent. on entering, rose to 40 per cent. ten days later. Another examination a week later showed that the hemoglobin still stood at 40 per cent. Feces were again examined and found to still contain the ova of the ankylostomum duodenale. Treatment was repeated, but no more worms were found, and the patient left four days later, promising to attend the out-patient department, but we lost sight of him.

CASE 4.—Name Cheo. Resident at Yangloh. Age 14. M. Works in the fields. Entered July 7th, 1908. Symptoms: Anæmia, dyspepsia, epigastric distress and blood in stools. Hemoglobin, 35 per cent. Temperature ranged from normal to 102. Preparation as usual and treatment by eucalyptus mixture. A large number of ankylostomes were passed, but were not counted. Tonic treatment was given. By July 20th, hemoglobin registered 40 per cent. July 21st, the original treatment was repeated, when the patient was transferred to the out-patient department to be lost sight of as usual.

CASE 5.—Chen. Hanyang. Age 26. Vegetable gardener. M. Entered September 11th, 1908. Had been ill for two years with debility and œdema of the extremities. For this latter trouble native doctor interdicted the use of salt for one hundred days without avail!

Present Condition.—Patient is pale, profoundly anæmic, face puffy, no ascites, much œdema of legs, slightly of feet, none of upper extremity, hemimurmur, lungs normal, tongue pale and flabby, evacuations normal, examination of urine negative, examination of feces revealed ankylostomum duodenale ova, hemoglobin not recorded. Evening temperature elevated, sometimes to 102.

Treatment.—Preparation as usual. Eucalyptus mixture on four successive mornings. 100 worms passed on the fifth day and 3 three days later. Tonic treatment. Feces examined on September 26th, 1908. No ova found. Patient discharged well on October 5th, after twenty-six days in the hospital.

CASE 6.—Ch'en. Admitted September 26th, 1908. Illness had lasted about four to five years. Started with ague, lasting one and a half years; then large spleen. Complains mostly of enlarged abdomen and epigastric distress. Evening temperature is slightly raised. Hemoglobin 75 per cent.

Preparation as usual. Treatment with the eucalyptus mixture; on four successive mornings, fasting. No parasites were found. October 5th.—Two doses of thymol were given; 2 and 15 grains respectively. Still no worms were found, but as further examination of the feces revealed no ova, and the man was steadily improving, the patient was probably rid of his hungry guests.

CASE 7.—Yang. Hanyang. Age 14. M. Works in the fields. The lad had been ill for five months with fever, diarrhoea, pain in epigastrium, vomiting, and oedema of both legs. He was very emaciated and weak; profound anæmia. Hemoglobin 45 per cent. After treatment with the eucalyptus mixture 2 ankylostomum duodenale were found, and nearly 100 ascaris came away after further treatment with male fern. On December 7th, hemoptysis set in. Every night the patient expectorated about ten cc. of pure blood. This symptom was checked entirely by astringents, but he died on December 15th, 1908, 24 days after admission.

CASE 8.—Liu. Hwangpei. Age 15. M. Farm laborer. Spends some time in vegetable garden every day. March, 1909. Both parents died when he was about one year old. Has felt pain in region of stomach as long as he remembers. Dyspepsia. For two years has suffered frequent attacks of vertigo. Nine months ago had severe ague, which lasted for three months. For few days has vomited after eating.

Present Condition.—Patient is profoundly anæmic. Hemic murmur under right clavicle and stomach dilated and prominent. Hemoglobin 40 per cent. Feces showed abundance of ankylostomum duodenale and ascaris lumbricoides ova. A powder of santalin and calomel was administered with good result. Preparation as usual, using ol. ricini as the purgative. Five drachm doses of the eucalyptus mixture were given on four successive mornings. He had rather bad symptoms

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each time after taking the medicine. Vertigo, rapid weak pulse (102), and the patient feels "puh-hao-ko" (not good).

By March 28th, no parasites had been found, but patient was slowly improving. He was put on extra diet and syr. fer. phos. co., and his after-history is shown by the following percentage of hemoglobin: entrance, March 6th, 40 per cent.; April 4th, 50 per cent.; April 12th, 60 per cent., gradually increasing until June 17th, when he had 95 per cent. of hemoglobin and no ova of any kind in his stools. Patient was discharged cured, after being eighty-three days in the hospital.

CASE 9.—Kao. Hanyang. Age 40. M. Boatman. Patient has passed blood per rectum for about three months. He is very emaciated, sunken above clavicles, ribs protruding, heart beats 4th interspace in nipple line, liver is handbreadth below the rib, spleen not enlarged, heart negative, lungs coarse, rales on left side, no oedema of extremities, red vessels very faintly visible in the conjunctiva, abdomen enlarged; contains fluid. Has been in the habit of taking strong spirit on an empty stomach. Frequently drinks unboiled river water while rowing his boat. Very seldom takes tea. Hemoglobin 55 per cent. Diagnosis.—Hypertrophic cirrhosis with ascites, and treatment accordingly. Feces were examined April 24th, eighth day after admission, and found to contain an abundance of the ova of *ankylostomum duodenale* and a few *T. duodenale*. There was a high evening temperature and normal morning. One ounce of the eucalyptus mixture was given on three successive mornings, when he went home to get some more rice money; so we lost sight of him. He was much improved, however, and the ascites had not returned.

CASE 10.—Yu. In-u-cheo. Age 49. M. Kitchen gardener. History of successive chills, debility. There is profound anæmia with pale and flabby tongue. Hemoglobin, 25 per cent. Preparation as usual, with liquid diet and purge. April 3rd, 1909, gave *perle izar mii* every two hours until twelve were taken, repeating the same dose next day, followed by a purge. There was no result. April 26th, 1909, gave 1 ounce of the eucalyptus mixture and repeated the dose on the two following days. By June 8th, the hemoglobin was increased by 10 per cent., and patient was transferred to O. P. for further treatment.

CASE 11.—Tsan. Mienyang. Age 7. This case is interesting in showing how the parasite may persist, notwithstanding all kinds of treatment. The child's main trouble was a valvular lesion of the heart.

Microscopical examination of the feces showed an abundance of ascaris lumbricoides and some ankylostomum duodenale and T. duodenale. Santonin produced the usual wonderful result.

April 29.—Eucalyptus mixture, $\frac{1}{2}$ ounce was given, resulting in four bowel movements, but no ankylostomes.

April 30. The above dose was repeated. Result more ascaris, but no ankylostomes.

May 1.—Examination of feces revealed all three ova.

May 2.—Beta naphthol, $1\frac{1}{2}$ grains. Repeated three times on May 3. No result.

May 6.—Thymol, 2 grains at seven o'clock, repeated at eight o'clock, 4 grains at ten o'clock, repeated at 11.15. Twelve grains in all.

May 7.—Twelve more grains of thymol were administered.

May 8.—Pulse was very feeble in the early morning.

On May 11 and May 13, the patient was again given $\frac{1}{2}$ ounce of the eucalyptus mixture.

May 17.—Ova of ankylostomum duodenale were still found in feces, and worms had not been found.

May 21.—Male fern, 10 minims.

May 23.—Male fern, 15 minims.

May 25.—Male fern, 15 minims. All with no result.

Symptoms showed that as strong doses of the various remedies were given as the heart would stand, but without seeming to affect the parasite.

CASE 12.—Wang. Wuchang. Age 12. M. Works on farm. October 4th, 1909. Says his father has suffered like himself for seven or eight years—"pale, swollen and yellow." Mother alive and well. One and a half years ago felt weakness in hands and feet. Later pain in the abdomen and diarrhœa with blood and some tenesmus. Still suffers from diarrhœa; three or four motions daily and passes blood mixed with the feces.

Physical Examination.—Face pale and yellow. Sclera slightly jaundiced. Boy is very emaciated. Abdomen enlarged. Spleen and liver both slightly enlarged. Tongue pale, not coated. No œdema of extremities and no ascites. Heart.—Some adventitious sounds with both systole and diastole over nipple, where is found the apex beat. Probably pericardiac. Hemoglobin, 50 per cent. High even temperature.

Examination of Feces.—One slide contains 5 ova of ankylostomum duodenale and 7 ova of schistosomum japonicum.

Treatment was by thymol and purgatives. The nurse only discovered one worm, but he probably missed many others. No further ova of ankylostomes were found in the feces, but the schistosomum japonicum, alas, remained untouched.

CASE 14.—Chang. Parrot Island, Hanyang. Age 42. Farm laborer. March 3rd, 1910. There was nothing striking in the patient's history. He was suffering from the usual symptoms attending a profound anæmia. Examination of viscera revealed nothing abnormal. Hemoglobin 50 per cent. Specimen of feces contains a few ascaris lumbricoides and an abundance of ankylostomum duodenale ova.

Preliminary treatment as usual. Gave two doses of thymol of 15 grains each with an hour interval in the morning, followed by 6 drachms of sulphate of magnesia. The nurse found no ova. I have lowered the price to one cash each now, and I fear they do not take the same care in washing the feces as they did when the price was ten cash a piece.

Examination of feces four days later showed no ova. Chalybeate treatment was continued. The feces contained no ova in specimen examined on March 21st. Hemoglobin had risen from 50 per cent to 65 per cent, and he was discharged on April 5th, 1910, to make room for a more needy case.

The leucocyte count in the above case was as follows :—

Polymorphonuclears	...	...	...	...	...	...	30.00
Polynuclears	...	...	...	...	...	...	26.5
Mononuclears	...	...	...	...	...	...	9.7
Lymphocytes	...	...	...	...	...	...	14.5
Eosinophiles	...	...	...	...	...	...	19.3
							100.00

CASE 15.—Chen. Ts'aitien. Farm laborer. M. Age 20. March 11th, 1910. History.—Four years ago spent most of his time in the water, either in the rice fields or in catching fish. He then had dysenteric symptoms, lasting three to four months. Has suffered much from ague. Spleen enlarged below level of umbilicus. Examination of lungs, heart and liver revealed no abnormality. There was no œdema or ascites. No parasites found in blood. Hemoglobin, 60 per cent. Eosinophiles, 7 per cent. Patient was anæmic. In a specimen of feces examined on March 14th only 3 ascaris eggs were found in the two slides examined.

Four days later two slides from another specimen was examined, and showed 14 ascaris eggs, 4 ankylostoma eggs and 1 schistosomum japonicum egg. I should be glad of an explanation why these ova were not found in the first specimens examined.

Preliminary treatment was as usual. The anthelmintic used was thymol; three doses of 15 grains each while fasting at intervals of one hour. Two slides of a fresh specimen examined on May 25th

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revealed schistosomun japonicum ovum and none of ankylostomum duodenale. Two subsequent examinations were made with no ova of any kind being discovered. The patient was discharged on April 5th, 1910, feeling and looking well and with 90 per cent. of hemoglobin; the spleen, however, was not diminished, and the schistosomum japonicum will probably be heard from again.

CASE 16.—Liu. M. Hanyang. Age 20. Scavenger. Father died three years ago, probably from tuberculosis. Mother alive, but in poor health. Patient has never been robust. Has had dysentery and has passed blood in stools on and off for two years. Is very pale and anæmic, face is œdematous, chest narrow, ribs prominent, abdomen enlarged and contains fluid, pulse very weak. Examination of viscera negative. Two slides examined of washed specimen of feces contain an abundance of ascaris eggs and two ankylostomum duodenale. Urine contained no albumen. Patient was put on tonic treatment for a few days with a view to improving his general condition. Preparatory treatment was as usual. Anthelmintic was administered as follows:—

Ol. eucalypt.,	I drachm.
Spts. chloroform, I	„
Ol. ricine,	ad. 1 ounce.

One drachm of this was given every hour for five doses on March 31st and the remaining three doses on the morning of April 1st. Small doses were expressly chosen on account of the weak condition of the patient. At four o'clock, on April 1st, that is, about six hours after the last dose of the medicine was taken, patient showed signs of syncope; was unable to speak and had a faint fluttering pulse. Gave spts. ammon. arom., 1 drachm. Patient revived. Took a bowlful of beef tea. He never fully rallied, however, and died at eight o'clock next morning.

It will be noticed that the great majority of these cases worked on the land as farmers or as kitchen gardeners, in which employment they would be specially liable to the disease through working on infected soil; others working in infected water would be similarly liable.

The symptoms may be summarized as follows:—

1. Anæmia with its subjective symptoms, such as debility, mental apathy, depression, vertigo. Also hemic bruits. The lowest hemoglobin percentage was 25 and the highest 70 per cent. with an average of about 45 per cent.
2. Œdema of the legs as an initial symptom in two cases, but developing during treatment in three others. There is usually no ascites.
3. Nearly every case showed a slight rise in the evening temperature; some rising as high as 102, while the morning temperature remains normal.
4. Dyspepsia and pain in the epigastrium.

5. Blood in stools, with or without tenesmus.
6. Emaciation is usually marked.
7. Marked eosinophilia ranging from 7 to 19 per cent. in the cases examined.
8. Liver and spleen not usually enlarged unless there is schistosomum japonicum infection or some other trouble complicating it.
9. The characteristic ova found in stools.—If, however, no ova are found this does not necessarily contraindicate the existence of ankylostomiasis. The parasites may have disappeared while the symptoms caused by those parasites may remain. Further, it is quite possible that male worms or females too old to lay eggs may menace a patient long after ova have ceased to be found in the feces. Many higher creatures do not lay eggs during the last third of their existence, and it is quite possible that a similar rule applies to this parasite. Dr. C. C. Bass, of New Orleans, recently dissected 247 uncin. amer. and found that 18 or 7 per cent. of the adult female worms contained no eggs. This fact may have important clinical bearing upon the subject and may explain why some patient fail to recover from their anæmia even when no ova can be discovered in the feces.
10. Stunted growth and juvenile appearance.—Men of 20 often look like lads of 14. This is especially the case when infection takes place before puberty.

It is possible to have the disease without any manifestations. Recent investigation showed infection of 31 per cent. of male students examined in one of the State normal schools in Texas. Little or no outward manifestations were found in any of those infected. Several of the cases in the Hanyang hospital were only discovered by routine work and not through any particular symptoms suggesting intestinal parasites.

Some light is thrown upon the cause of losing so much blood in ankylostome infections by an interesting experiment by Dr. Allen J. Smith, of Texas. It does not seem possible that serious symptoms should result from the loss of the small amount of blood which twenty to thirty ankylostomes would consume. A patient loses about as much blood every time we prick his finger for a blood film, as that number of ankylostomes would probably eat in twenty-four hours. It is the leaking of blood into the intestine after the parasite looses its hold that is so serious. It would be expected, however, that the blood from the small punctures would quickly coagulate and bleeding cease. This suggested to Dr. Smith that perhaps while the parasites were feeding they injected a poison which interfered with the coagulation of the blood. Dr. Smith obtained a number of living specimens of the hookworm found in dogs, which closely resemble the ankylostomum duodenale, and cut off their heads and tails. These were separately ground with normal salt solution between pieces of ground grass.

Then fresh blood was drawn from a dog, 1 cc. of which was added to a head solution, another 1 cc. to a tail solution, and another 1 cc. to

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normal salt solution as a control; the quantities being equal in each case. The central mixture and the tail mixture coagulated in five to nine minutes, while the head solution took four to eight hours to coagulate. It is quite possible therefore that after the parasite has loosed its hold upon the mucous membrane the puncture may continue to bleed for hours or even days.

As to *treatment*. You will notice from the cases recorded we have used aspidium, eucalyptus mixture with chloroform and castor oil, as recommended by Sir Patrick Manson, thymol and beta naphthol, and one case was treated with fair doses of all four drugs without result, but this happily is unusual.

I have had bad, even alarming symptoms with two of my cases after treatment with the eucalyptus mixture, and I do not now use it with the same confidence I once did.

I have seen no ill results from thymol, and I believe that if the usual precautions of keeping the patient in bed and withholding all oils, fats and alcohol are observed, there is little to fear even from large doses. It is, however, contraindicated in gastritis, dysentery, nephritis and in cardiac disease, nor can it be used with safety in advanced cases of ankylostomiasis in which prostration is extreme.

In the administration of thymol too one should be guided by the apparent age of the patient rather than the actual age. A patient of 20 may not be more developed than one of 14, and should be treated accordingly.

Up to five years the dose of thymol is 7-10 grains.

5-10 years, 10-20 grains.

10-15 years, 20-40 „

15 and over, 40-60 „

Divide the dose in two parts and give at intervals of an hour on an empty stomach. Followed by calomel and soda or sulph. of magnesia; certainly not ol. ricini. Beta naphthol may be used in similar doses and is considered safer.

The adult dose of the eucalyptus mixture, as advised by Sir Patrick Manson, is:—

Ol. eucalypt, drachm $\frac{1}{2}$.

Chloroform, minims 45.

Ol. ricini, drachms 10 M/.

One-half first thing in the morning, and the other half thirty minutes later.

I have found aspidium, in one drachm doses, successful where eucalyptus mixture has failed.

ANTHROPOMETRY OF CHINESE STUDENTS.*

By EDWARD M. MERRINS, M.D., Wuchang.

It is necessary for me to commence with a few apologies for the imperfections of this paper. (1). The subject being rather a dry one, I wished to make it more interesting by comparing the physical measurements of the 219 Chinese boys and 69 girls in our Wuchang schools, with the measurements of students of all nationalities, but I have only succeeded in obtaining material to make a few comparisons with English and American children. Nor have I obtained the measurements of Chinese students taken in other provinces except those of the boys of the Shantung Union College, kindly sent to me by Dr. Roys. (2). In some of the physical tests a little practice makes a great deal of difference, and as it was not possible to give this practice, except in a few cases, the results stated are not quite so high as they might be. (3). For the sake of being able to make comparisons, the old method of ascertaining the arithmetical average has been adhered to, instead of the more accurate way of taking the mean value, i.e., the median measurement which has as many values above it as below. (4). The full and accurate family statistics which enable us to interpret more completely the physical condition and prospects of the children were hard to obtain. For instance, as a side issue, I thought we might be able to get some idea of the infant mortality in China by inquiring of each boy how many of his brothers and sisters died in infancy and from what cause. The number of those who so died was given, how correctly I cannot say, but there were very few indeed of the boys who could say anything trustworthy about the cause of death. (5). Because of Chinese custom and sentiment the only measurements taken of our school-girls were the height, length of feet and the weight.

HEIGHT.—We pass now to the physical measurements of 219 boys between the ages of 11 and 23. First, the *height*. The tallest boy in the school, aged 21, a Cantonese born in Honolulu, in his stocking feet is just one-half inch short of being 6 feet high. The average height, however, of those who have practically finished growing, is only 5 feet 6½ inches. In Shantung it is 5 feet 7 inches. The period of most active growth is between the age of 11, when the average height is 4 feet 2 inches, and the age of 16, when the average height is 5 feet 4 inches; the gain during this period being no less than 14 inches. At the age of 19 the average height is 5 feet 4½ inches; at 21 years, 5 feet 6 inches, and at 23 years, 5 feet 6½ inches; the gain from the age of 16 being only 2½ inches. The averages are much lower than those of over 4,000 boys of Boston.

* Read before the Triennial Conference of the China Medical Association, February, 1910.

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Massachusetts, and of boys belonging to the favored classes in England; they correspond very closely to those of the English artisan class. Recently the average height of the Yale collegian in his 19th year was found to be 5 feet 8 inches, which is $3\frac{1}{2}$ inches taller than the average height of the boys measured here of the same age and 3 inches taller than the boys of Shantung.

Up to the fourteenth year, the difference in height between Chinese boys and girls is not very great; after that year, there is a difference of about four inches. Chinese girls are much shorter than English and American girls. The American girl of fourteen is almost as tall as the fully-grown Chinese girl of this province. In the accompanying table, comparisons can be easily made.

HEIGHT IN INCHES (without shoes).

AGE.	11	12	13	14	15	16	17	18	19	20	21	22
American boys ...	54.	55.8	58.2	61.	63.	65.6	...	...	...	...	...	...
English boys (favored classes) ...	55.	57.	58.	61.	63.	66.	67.	68.	68.	69.	69.	69.
English boys (artisan class) ...	51.	53.	56.	57.	60.	63.	64.	65.	66.	66.	66.	66.
Chinese boys ...	50.	54.7	55.5	58.8	62.	63.8	64.2	64.	64.7	64.5	65.8	66.
American girls ...	53.8	57.1	58.7	60.3	61.4	61.7	62.	62.	...	...	...	...
English and American girls ...	53.2	55.7	57.9	59.8	61.	61.6	62.2	62.1	...	...	...	...
Chinese girls ...	...	52.2	55.	57.2	58.	59.	59.2	...	60	...	60.5	...

WEIGHT.—The heaviest boy in the school, aged 17, weighed 186 lbs. The average weight of those who are 21 years of age and upward is 119½ lbs. In Shantung they are much heavier; the average being 141 lbs. In the 11th year the gain is $8\frac{1}{2}$ lbs.; in the 12th years, $7\frac{1}{2}$ lbs.; in the 13th year, 12 lbs.; in the 14th year, 13 lbs.; in the 15th year, $11\frac{1}{2}$ lbs.; the average weight then being 106½ lbs. The increase is then gradual to the 21st year, when the average weight, as already observed, is 119½ lbs., a gain during these five years of only 13 lbs. These weights are much lower than the averages of over 18,000 American boys of all classes. The average weight of this year's Yale freshman class, of the average age of 18, is 138 lbs., which is no less than 26 lbs. heavier than the average weight of Wuchang boys of the same age and 16½ lbs. heavier than the Shantung boys. Boys belonging to the wealthier classes in England are also much heavier than our boys of the same age. As compared with the English artisan class, up to the 17th year, the Wuchang boy is slightly heavier; after this year the English boy forges ahead.

Chinese girls weigh much less than their sisters in the Occident; the difference in some years being over 20 lbs. English and American girls are also much heavier than Chinese boys. The greatest difference in any one year, between Chinese boys and girls, as may be seen in the accompanying table, is not more than seven lbs.

WEIGHT IN LBS. (weight of clothes deducted).

AGE.	11	12	13	14	15	16	17	18	19	20	21	22
American boys ...	68.8	73.6	79.1	88.7	103.9	114.6	...	...	...	...	...	...
English boys (favored classes) ...	64.	71.	79.	89.	101.	117.	131.	137.	139	141.	143.	145.
English boys (artisan class) ...	60.5	64.5	69.	75.5	87.5	99.5	107.5	114.	119.5	121.5	121.	126.
Chinese boys ...	53.7	62.	69.7	81.6	95.1	106.4	108.2	112.	111.4	117.2	119.7	119.6
American girls ...	70.3	81.4	91.2	100.3	108.4	113.	...	...	...	...	...	...
English girls ...	68.5	77.	88.	97.5	105.5	112.	115.	116.5	...	...	...	...
Chinese girls ...	...	57.2	72.5	82.5	90.5	99.7	103.	...	104.	...	116.	...

CHEST MEASUREMENTS.—For the purpose of comparison the chest measurement is taken midway between full inspiration and expiration. Up to the sixteenth year the averages are about the same as those of American boys. After the age of 14, it is much less than the average of boys belonging to the well-to-do classes in England and very much less than that of the boys of the well known Rugby School in England, whose chests had been developed by special exercises; the difference each year between the 14th and the 19th ranges from 4 to 8 inches. At the age of 21, when it may be presumed the thoracic capacity of the Chinese boy has almost reached its maximum, the chest measurement, midway between expiration and inspiration, is 33 inches. Possibly with a little practice Chinese boys could make a much better showing, for they do not at once understand how to expand the chest fully, but making every allowance for this, it must be admitted that most of them appear to be very weak-chested. For this reason, and because of the great prevalence of pulmonary tuberculosis among students, particular attention should be paid in all our schools to exercises that develop the chest.

CRANIAL MEASUREMENTS.—The linear measurement of the horizontal circumference of the skull taken over the thick hair which goes to form the queue of a Chinese boy, ranges from 20 inches at the age of 11 to 22.4 inches at the age of 21. In the adult European male the average is said to be 20.7 inches, so these measurements seem to indicate that the cranial capacity of the Chinese is greater than that of Europeans. But careful measurement of the skulls of different races made by filling the empty cranial cavity with small shot, and then measuring the quantity in a graduated vessel, special precautions being observed in order to obtain equable results, proves that the average capacity of all races is 85 cubic inches; the average for Europeans being 90.3; for the Chinese, 87.3, which is quite a considerable difference. The head measurements of 1,091 American boys between the ages of 16 and 19, gives an average of 22½ inches, which is one-half inch greater than the average for Wuchang boys of the same age.

Recently there has been an animated discussion in England concerning the size of the head of one of their statesmen, the present Chancellor of the Exchequer. The president of the British Phrenological Society declares that to his personal knowledge this statesman's head has grown in the last few years of his political life from 23 inches in circumference to 23¼ inches. Against this is the authoritative statement that a series of minutely accurate measurements taken a few years ago of the heads of a large number of Cambridge University undergraduates by scientifically trained members of the Anthropological Society, proved beyond question that, apart from diseased conditions, all development of the skull ceases about the end of the 21st year, though rarely the skull may grow up to the 25th year. Our own observations show that the Chinese skull does not grow after the 21st year; it has almost attained its maximum size by the 18th year.

HANDS.—The hands of Chinese boys have almost attained the maximum size by the age of 15. The glove size of the hand is then 7.3 inches; at the age of 21 it is 7.7. The average size of the hand of grown boys is about 7.5 inches. This is rather surprising, as somehow one receives the impression that the hands of the Chinese are extremely small. Probably they are so among the youth of the wealthier classes, who take no exercise. In an authoritative work on heredity, the statement is made that the hands of the Japanese differ in some anatomical particulars from the hands of American and Europeans. As the Chinese belong to the same race, their hands may be different in this respect also, but what the difference is I do not know. Taking the general average, the right hand is very slightly larger than the left. Left-handed boys are few.

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FEET.—As with the hand so with the foot; it has almost attained its maximum size by the 15th year, when the average length is 9.3 inches. At the age of 21 the average is only slightly more, viz., 9.5. We may say then that the average size of the Chinese foot, from the age of 15, is $9\frac{1}{2}$ inches. Chinese boys therefore are not exceptionally small-footed. At the age of 11, the unbound feet of Chinese girls, on the average, measure $7\frac{1}{2}$ inches; at the age of 13 years, $7\frac{3}{4}$ inches; at the age of 15 the feet have attained the length of 8 inches, at which size they seem to remain. Considering how much below the average Chinese girls are in height and weight, when compared with English and American girls, it cannot be said that the feet of Chinese girls, when allowed to develop normally, are unusually small. This is in accordance with the law, if it may be called so, that acquired characters are not transmitted. Feminine foot-binding, though practised for many generations, has no appreciable effect on the feet of descendants.

SIGHT.—Only 44 per cent. of the boys have normal visual acuity. In many of the cases, however, of defective sight the defect is not very serious— $\frac{3}{8}$ instead of $\frac{1}{2}$ —and perhaps allowance must be made for what is to many of them a novel procedure. Yet it cannot be gainsaid that the proportion of short-sighted people among the Chinese is very large. Some may be inclined to attribute this to the studious habits of the people and the crabbed characters of their written language. But in the light of Weissman's theories we may regard it as one of the retrograde physical effects due to the ancient and advanced civilisation of the Chinese. In primitive states of society, keen sight is a decided advantage in the struggle for existence, especially among those who follow the chase and delight in war, and the short-sighted are weeded out. But when society is in a state of settled peace and order, a short-sighted man makes his way in life as successfully as any other. Particularly has this been the case in China, where for many centuries scholarship has been the main avenue to success in life, and most of the successful have been obliged to wear spectacles. The congenital defects of these scholars have been transmitted to their children, so the short-sighted have increased with each generation.

COLOR-BLINDNESS.—Only one boy is color-blind. If this is the proportion among the general population—one person in over two hundred—it will be a comforting thing to remember when the ship pilots and railroad engineers in this country are all Chinese.

HEARING.—Those with defective hearing are less than three per cent. It may be the proportion is really larger, as a number of boys, all more or less in a state of noisy excitement, were examined at one time, so it was impossible to secure the necessary quietness for delicate testing, and one was obliged to estimate the hearing in the simplest way.

TEETH.—Considering the number of bad teeth one sees in dispensary practice I was rather surprised to find that most of the boys had almost their full complement of very good teeth. In about 35 per cent. the teeth were somewhat defective, but in no case were they so bad, to mention a rough test, as to render unfit for military service.

THE BIRTH RATE.—Several other measurements were taken, but as I have not the material for comparison, these need not now detain us, especially as no reference has yet been made to the related subject of the birthrate, upon which may be interesting to say a few words. Altogether to these 200 families, 1,230 children were born. This gives an average of rather more than six children to each family. The boys numbered 788, the girls 442. In European countries the female births steadily exceed those of males; in England, certainly, there has

been this female preponderance for over two hundred years. Every other continent, so far as known, has an excess of males, but in continental United States, where the relative excess of males is said to be greater than the average for all other countries, the excess is not very great; about 102 males being born to every hundred females. Yet in China, if the ratio indicated in the figures here presented be correct, the males born outnumber the females by nearly two to one; the exact figures of the birth-rate being 64 per cent. for the boys and 36 per cent. for the girls. It may be that some of the girls were still-born and were not recorded in the family register, and in time not even remembered. At first, in trying to account for this remarkable difference in the birth-rate, I thought it might be due to sinister causes, for we sometimes hear stories of girl babies being put to death when they are not wanted, but in the course of conversation one evening with some of the medical students who assisted me in making the examinations and recording the family histories, one or two casual remarks by them dispelled my tragical conjectures to a large extent, for I learned that Chinese boys hate to be called "uncle" by their school-fellows, and so do not like to confess they have grown-up sisters. These unacknowledged sisters might make the respective birthrates much more even than is now the case. Continuing with our figures, such as they are, after the children have been fairly launched upon their earthly career, the relative mortality continues to be adverse to the girls; 190 deaths among 442 girls being at the rate of nearly 25 per cent., whereas the 136 deaths among 788 boys is little more than 17 per per cent. Once again the sisters-mentioned must be taken into account; probably the mortality is about the same for both sexes. These deaths reduce the average number of children for each family to five, or, to be more precise, to 4.92. Allowing two adults to each family—which in Chinese homes is surely under, rather than over the actual number—this will give an average of seven persons to each family. It is interesting to compare this with the average of English and American homes, as no less a statesman than ex-President Roosevelt thinks that the Chinese at the present day are not increasing relatively as fast as the Anglo-Saxons, who will consequently soon be within measurable distance of equality with them in point of numbers, and therefore the industrial and commercial competition of the Chinese need not be feared abroad. In the United States the average size of families were 4.7 persons in 1900, against 5 in 1880 and 5.6 in 1850. In English homes, according to the last census, the average number of persons in each family is 4.62.

It may be well to state the actual number of children born in each of these two hundred families. Forty-seven families had less than four children each; 26 families had four; 25 had five; 28 had six; 15 had seven; 15 had eight; 11 had nine; 6 had ten; 10 families had eleven children each; 4 had twelve; 4 had thirteen; 4 families had fourteen children each, and of the 56 fourteen have since died; 1 family had 16 children with eight deaths among them; 1 family had eighteen children, of whom six have died; 1 family had nineteen, and 1 family had the patriarchal number of twenty-four, of whom eighteen are still in the land of the living. The proportion would be larger still if the older sisters had been included; on the other hand, allowance must be made for the uncertainty as to whether the father had only one wife, and for the Chinese custom of reckoning as brothers and sisters children living in the same house who are cousins, or even more distant relatives. All these uncertainties show that in dealing with statistics furnished by the Chinese, we are on a quaking morass.

The question now arises, What is the value, if any, of work of this kind? In reply it may be said that quite apart from the desir-

ability of finding the average physical standards of Chinese boys, so that we may the more readily recognise deviations from the normal, such studies, when extensive and accurate, enable us to forecast, to some extent at least, a nation's present condition and probable future destiny; they furnish the material upon which we base our diagnosis and prognosis, as it were, of the maladies and weaknesses of the body politic. Of course it is not claimed that the figures presented in this paper are at all adequate for drawing such important conclusions, but so far as they go, what do they indicate?

(1). The necessity there is for the government to organise national and provincial bureaus of vital statistics, with one or more registrars in every large town and city, and that the registration of all births, marriages, and deaths should be made compulsory by law. There should also be no burial without a death certificate being signed by some responsible person, and in this certificate the cause of death should, if possible, be accurately stated. There is now an intense national feeling in China, and perhaps if the people were aware of the great mortality due to infantile diseases, to pulmonary tuberculosis, small-pox, malaria, cholera, bubonic plague, and other infectious diseases, they would take the necessary measures to combat these evils which weaken the national life. The only way to inform the officials and people, and so arouse national sentiment, is to issue publicly, as is done in nearly all other civilised countries, full and accurate vital statistics, and this cannot be done without proper registration.

(2). From the measurements here given it is evident that Chinese boys in this section of the country are of backward physical development compared with boys belonging to the wealthier classes of England and America. It therefore falls on those in charge of our schools to remedy this, as far as possible, by proper care and training, particularly during the period of most active growth. In this connection we venture to offer one or two suggestions. (a). A careful physical examination should be made of all boys on entering school and the facts recorded for comparison with later examinations, which might be made annually, or even more frequently. The primary examination will reveal the lad's weaknesses and defects, his capacity for work and hard games, his vulnerability to tuberculosis or other disease, and measures can then be intelligently prescribed that will enable him to acquire full health and physical vigor. Later examinations, when they indicate that the boy is not developing normally, will necessitate inquiry into his mode of life, the suitability and sufficiency of the food, cloth-

ing, accommodation, etc., whether he is suffering from overwork, or is not taking proper and sufficient exercise. Faults found can be then corrected. (b). Each school should have a physical director, who may be either a well-instructed Chinese, or a foreign member of the teaching staff with a zeal for athletics, whose work should be to regulate and supervise the physical exercises of the boys and to make the periodical examinations and registrations. Under this system of careful nurture and training, boys should leave school with a durable foundation laid for vigorous future development of body and mind.

(3). Lastly, there is the intellectual and moral nature of the boys to be considered, for mind and body act and interact one upon the other. The vast population and high birth-rate of China would seem to preclude her from ever being classed with those nations which have a life to live, but are dead or dying, as a great English statesman declared a few years ago was the present condition of the Latin races. It must not be forgotten, however, that in the struggles between nations, other factors count besides quantity, as we have seen in the war between Japan and Russia. Quantity, unless it also represents quality, is no great actual strength. So with the family upon which the national life depends. The quality of the children is of more importance than their number. Hence it is of vital importance to the nation that in all the schools in the land there shall be a high moral tone, for it is during school-life that the foundations of moral character are laid. If boys do not then acquire the virtues of truthfulness, honor, courage, self-respect, courtesy, etc., they will hardly acquire them in after life. Instructors may do much to form and maintain this high standard, but it is the moulding influence of school-fellows which is generally the more deep and abiding, either for good or evil. Boys with evil propensities, no matter how bright, wealthy, or well connected they may be, should therefore be rigorously weeded out. Better the few should suffer than the school be corrupted. All should enter upon their life work, after passing through the schools, with sound bodies and with sound minds, sound in the highest sense; and the fervent patriotism of the students should be deeply imbued with the conviction that it is righteousness alone, individual righteousness, social righteousness, political righteousness, which exalts a nation.

THE NEED OF MORE HOSPITALS FOR INSANE IN CHINA.

By C. C. SELDEN, M.D.

Dr. J. G. Kerr spent the best of his life in Canton as a medical missionary. He was respected and beloved by the Chinese, for whom he had done so much. For many years, while in charge of the Canton Hospital, he had had the desire to open a hospital for the insane, but he had nearly reached the end of his life's journey before opportunity came to him. Many had opposed the plan as premature since men and money were both scarce. They felt that other medical work offered better opportunities for preaching the Gospel than could a work for the insane. But it was the Master Himself who had put into that noble man's heart the desire to do something for a class of patients who were neglected and in many cases oppressed. All along the way there have been abundant proofs that this work, begun by Dr. Kerr—not in his own time, but in the Master's wiser time—was of God's bidding.

In 1892, Dr. Kerr found a piece of land of about four English acres well located for the purpose he had in view. This he procured by paying for it himself. The land is located at Fongtsün, directly across the river from the foreign concession of Shameen. This place is easy of access from the city of Canton, and yet is in open country. Such a location is most desirable. Not only is it possible to get more land for the same amount of money, but it is better also for the patients. Very seldom are there noisy idol processions or other causes for excitement in the neighborhood. It is necessary for the health of the patients to have open grounds, and it also does away to a large extent with the need of keeping noisy patients under the power of drugs. They may make considerable noise without outsiders being disturbed. A more extended discussion of this matter of site of land, as well as location of the buildings, etc., was published in the JOURNAL in March, 1908. None too much land was bought at that time, for the growing number of patients has made it necessary to add to it in size. We have now a little over six English acres, which we believe will do for 500 patients. More extensive grounds would, however, be very much better.

A friend helped Dr. Kerr to put up two large buildings. The work was thus begun independently of any board or society, and thus it has continued until now. Not that we would usually advise such independent work. This was a case of necessity. Those buildings were ready in the winter of 1898, and a patient was waiting to be

admitted the day the hospital was opened. The writer remembers seeing that patient before admittance. She was sitting on the floor of a little hut built over the water with a chain about her neck and with a dejected expression of countenance. That patient recovered and went again to work.

In 1901, after a long illness, knowing his life in this world was nearing its end, Dr. Kerr said to the writer: "I give this institution into your hands." The founder's idea was to have a place to which insane people might be brought by their families or friends and cared for under better conditions than they could have in their own homes, where they were generally unwisely and often unkindly treated; sometimes even put to death, whether by neglect or violence. For six years this class of patients alone was brought. Dr. Kerr was well known to the officials of the vicinity, but it seems not to have occurred to him that these officials would be some day sending patients at government expense to the hospital he had opened. But one day in 1904 came an insane man brought by a policeman with a letter asking whether we would admit him at the expense of the Police Department. This was a new departure; the first occasion of official recognition. This man recovered and went back to the police, and soon another came from the same source. About the same time the writer went to Dongshang to see if it were possible to get any help from the Chinese there to put up a new building. In conversation with a public-spirited Chinese gentleman the latter said: "Perhaps you could take our cases from this colony and perhaps we could annually pay you a certain amount of money for their care." The next year these cases began to come. They are brought up in squads as they collect and are delivered over to a Chinese county magistrate, who there sends them to this hospital and supports them. Many from both official sources have come and gone. At present there are 122 of these officials' patients; the larger portion being those picked up on the streets of Canton.

In 1903 and 1904, family patients were admitted from Amoy and Foochow. Since then patients have come from various places—Foochow, Shanghai, Chinkiang, Weihaiwei, Tientsin. Most of these from a distance are cases which have been insane for a long time and for whom there is little hope of recovery. It is difficult to take care of these from the north. We cannot understand their language when they would tell us their wishes, nor can we make them understand us, unless occasionally we can find an interpreter. They are surely sometimes lonely, and this is not favorable for mental improvement. These

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people are larger and stronger also than our Cantonese, and the latter, not being able either to use language to persuade, nor having sufficient physical strength, do not like these patients from the north.

Last year all the five buildings were full, and two matsheds had to be erected to receive the overflow. We had to inform the officials that we must refuse to accept any more patients excepting as some should go away, thus leaving room. We felt that if any were accepted it should be the family patients, as care of the insane in the house is difficult and often dangerous and as such care is also usually unwise and sometimes cruel. The official cases on the contrary could, if necessary, be confined temporarily in the prisons. Our U. S. Consul asked the viceroy for some help toward putting up a new building. As a result the hospital received a grant of \$1,000 from the provincial treasury for the purpose. Soon the Police Department sent over a representative to talk over the situation. The Taotai had directed him to say he was very sorry we could not take all their patients and had instructed him to discuss plans for enlarging the institution. The result was that the Police Department made a grant of \$4,200 for the purpose.

Since the opening in 1898, 1,458 patients have been admitted. At the beginning of 1909 there were in the hospital 174 patients. At the end of that year there were 215, making an increase of 41 during the year. In 1909, 239 patients entered; 198 were discharged.

Of the discharged, there were :

Cured	97	or 40½%	of those entered,	49	%	of those discharged.
Improved.. ..	16	“ 6½% ”	“ ”	8	%	“ ”
Not improved	37	“ 15½% ”	“ ”	18½%	“ ”	“ ”
Died	48	“ 21 % ”	“ ”	24	%	“ ”

The two noticeable points are the large number of recoveries and the large number of deaths. The first is explained by the very simple fact of the large percentage of curable cases that occurred and the second by the fact that many were brought who were exhausted by disease and dementia.

The staff consists of Dr. Hofmann and the writer. With the efficient helpers of our own training we have little need of a native physician. The only regret is that we have so very little time for careful study of the individual cases—research work. Much of the work about an institution of this kind is such as does not require specific medical knowledge. There must be a physician on hand, however, to look after the hygiene of the premises as well as to attend the individual cases of illness and to direct the treatment of the mental trouble. But the

benefit which the patients derive depends more upon the nursing than upon anything else. We have now seventeen general, besides five private, attendants and three who take charge of patients at work. A watchman and watchwoman, man and wife, are on duty at night, and we plan soon to have an extra man or an extra couple since the buildings are now so separated. The door-keeper must be a wideawake man, noting who comes and goes, not allowing patients to pass out through the door, nor their friends to bring unsuitable articles to them. The kitchen has its quota of men. Two other men, who understand both masonry and carpentry, are always busy on repairs and small improvements. Three men, upon whom we lean very heavily, are the head attendant, the nurse, and the business man. The head attendant is a thoroughly reliable, conscientious Christian man. It was only after several years of experience as an ordinary attendant that he was put in charge of the others, teaching the new ones, ready to help in an emergency anywhere, responsible for clothing, finding room for new patients, etc. The nurse and druggist is a man we have trained ourselves after several years of experience as our ordinary attendant. The business man does much of the buying, makes the monthly collections for the patients' board, keeps the statistics, etc.

The history of the institution cannot be concluded without recording the fact that it was planned, opened, and has been carried on in prayer to the Wise Master Builder and Chief Physician. He has shown His approval and has given His presence; has always in His own time—not always in ours—provided men and means.

As indicated, the land and permanent building have come through gifts. The physicians' salaries are provided in the same way. The running expenses are met by the income from the patients. The room rent, paid by the well-to-do patients, is a very important item. There are always a considerable number who have no friends. These are dependent upon the hospital. But all of the official cases are paid for and about nine-tenths of the others. The prices are as follows:

Ordinary board in ward per month	...	...	...	...	...	\$4.00
Ordinary board in ward with clothing per month	...	...	...	...	...	5.00
Official cases all come under this latter head.						
Better board	...	...	...	...	...	6.00
Best board	...	...	...	...	...	8.00
Private room	...	...	...	...	...	6.00
Bed and private ward for three	...	...	...	...	...	3.00
Private attendant, board and wages	...	...	...	...	...	8.50

Thus a patient can pay from \$4 to \$22.50 per month. By arrangement with the officials the funeral expenses of such of their patients as die are paid by them.

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We rejoice in the confidence shown in us by the families especially in sending their wives and daughters, of whom there are about one-half as many as men. Some, however, do not wish to have their insane come unless one of the family can come along, a thing we never allow unless it be for the first few days. We always tell them the patient might just as well be at home. Confidence is also shown by the return of patients when suffering from a second attack. This has occurred many times.

It is a matter of disappointment on the other hand that patients nearly recovered are sometimes taken away by the friends without waiting for full restoration to health. In one case recently the friends said the patient was "9.9 parts" well, and they would take her. We prefer that they remain a full month after complete recovery before going back home.

In opening a hospital for insane we would advise that unless the physician in charge has had abundant experience, both with insane people and in institutional work, the same be begun on a small scale and be built up as experience enlarges and need requires. The patients will come soon enough. Eleven came in one day to us. Indeed this has happened three times. The physician called to this work should, after finishing his general medical course, give at least a number of months to the practical study of temperament of, and the methods of handling, the insane in the very best hospital for insane that can be found in the home land. We would for this purpose recommend, for any who can arrange for it, a course at the Manhattan State Hospital, Ward's Island, New York. Both Dr. Hofmann and the writer can testify to the interest and kindness shown by the staff of that hospital and to the benefit derived from their study there.

It must be kept in mind that an institution for insane is to be not only a home but a hospital. Two articles were published last year in the JOURNAL on the subject of "Treatment." They were not meant to be a text-book but only to indicate in a general way what can be done for these patients. The best text-book is actual contact with these cases in a good hospital at home as indicated above. Another paper on the general features of this work was published in the *Chinese Recorder* of May, 1909.

This hospital gives more opportunity for evangelistic work than would be apparent at first thought. Many patients are able to understand all the truth that is necessary to be saved. Those who recover have better opportunity, and an endeavor is made also to reach some at least of the many friends of patients who are passing in and out. We have

a meeting every morning for one-half of the attendants and as many of the patients as are able and willing to come. We read a short passage of God's Word and explain it, and have singing and prayer. It might just here be intimated that from the foreigner's standpoint the singing is not always quite up to the standard. Other meetings for Bible study and for singing are held during the week and on the Sabbath preaching service and Sunday School.

LIGHT, PIGMENTATION, AND NEW-GROWTH.*

By W. WATKINS-PITCHFORD, M.D., F.R.C.S., Government Pathologist, Natal.

A cell, or cells, of an otherwise healthy body may give rise, by fission, to "cancerous" progeny. Cancer appears as an unregulated process of growth, the possibility of which has probably existed from the time of man's earliest ancestors. The process will be most fruitfully investigated when it is considered as one to which the whole community of metazoan life is liable.

Miscroscopically examined the initiation of carcinoma proves to be a multiplication of epithelial cells in the *wrong direction*, of sarcoma, an *uncontrolled frequency* in the multiplication of connective-tissue cells in all directions. Cancer, therefore, is a misbehaviour of the body-cells in their function of multiplication; from the cytological standpoint it may be looked upon as a psychic phenomenon.

From the very dawn of life the cells of the body have been subjected to the discipline of a relatively fixed environment, the suggestion therefore arises that the cytodal misbehaviour indicated by cancer may be the result of some fundamental change in the long accustomed environment of the cells.

Cells from which a malignant new growth may arise have certain common characteristics: (1) Comparatively little morphological differentiation; (2) slight, if any, anatomical connections with other cells, and (3) the performance of functions associated with frequent multiplication by fission.

Carcinoma and sarcoma appear to be due to one and the same cause. Primary carcinomatous stroma is probably sarcomatous in nature. Although sarcoma may exist independently of carcinoma, yet, when it originates in the subcutaneous tissue, it seems to be frequently accompanied by some carcinomatous changes in the adjacent epidermis.

* Brief abstract of a paper communicated to the South African Medical Congress, 1909.

Every normal cell has, from the beginning, inherited certain fundamental physiological peculiarities, and its growth and multiplication by fission are instigated and influenced now as of yore. The activities of the cells of the higher animals are controlled more by the "habits" inherited from former times than by their present environment. These "habits" were originally acquired, and subsequently ingrained, under the compulsion of an environment which has now become so modified as to serve but as a "reminder" of former conditions.

Our inference as to the causation of cancer has been drawn from a survey of the phenomena associated with the relations of the animal body to light. No living matter is indifferent to light. Many unicellular organisms, both animal and vegetable, are phototactic. The growing seedlings of the higher plants exhibit a phenomenon (heliotropism) akin to phototaxis, for they bend over towards a source of light in such a manner that their cells multiply towards it. Not only do green, *i.e.*, pigmented plants grow towards the light, but their least differentiated cells—those of the mesophyll—are stimulated to fissional activity by a moderate illumination. If it be admitted that the individual cells which compose the spherical colonies of certain aquatic protozoans are similarly responsive to light—that they divide more freely when illuminated, and possess the capacity for phototaxis—then the whole colony, so long as all the members are uniform in their response, will remain symmetrical and will not be heliotropic. If, however, the cells in one region of the surface of such a colony become more pigmented and less phototactic than the remainder, then a "heliotropic axis" would become developed, and the colony would set itself in such a direction as to present the less pigmented more phototactic cells towards the light. The result of this change would be that the less pigmented cells would divide more rapidly than, and tend to envelope, their darker and more sheltered neighbours. Such a colony would speedily become unsymmetrical and would resemble the spheroidal larvæ of sycon and other primitive metazoans, for we find that these consist of a mass of small, colourless, cells superimposed upon a few, large pigmented cells.

These primitive anatomical peculiarities are found, we believe, in the morula stage of all animals, and are even foreshadowed in their germ cells. The mature, impregnated ovum is darker (more pigmented) on one side than the other, and its subsequent segmentation therefore results in the appearance of two varieties of cells—light and dark. In all animals above amphibians the lighter cells multiply with relative

rapidity and become the ectoderm; the darker cells form the entoderm. We are led to infer from these considerations that the primary cause of the differentiation of the embryonic layers may be an inheritance of those peculiarities of cell-fission which were the result of stimulation by light under the control of pigmentation. We suggest that the original function of pigment in early animal forms was to direct and restrain the fission of the cells; to produce, by originating a heliotropic axis, a more rapid multiplication—in a direction away from their pigmented neighbours—of the cells which become the enveloping ectoderm, whilst affording shelter to those which become the entoderm. A vitally important result of this pigmentary differentiation would be that the cells of the different embryonic layers would respect one another's domains, and thus the "integrity" of the tissues would be secured at the outset. The cells of the higher animals doubtless inherit the habits of orderly growth, which were thus acquired by their ancestors.

The phenomena of the internal pigmentation of animals appear to have hitherto escaped enquiry, and may prove to be of deep significance.

The entrance of light into the bodies of the higher animals is very sedulously regulated. We believe that an inverse ratio may be shown to exist between the degree of external protection from light and that of internal pigmentation. Internal pigmentation is evidenced in the entoderm of the more primitive metazoans and in the mesoderm (an offspring of the entoderm) of all animals, from the mollusca upwards. The blood of the higher vertebrates is a pigmented tissue of mesodermic origin. Among the lower vertebrates (fishes, amphibians, and reptiles) the mesodermic lining of the body-cavity is commonly pigmented. This peritoneal pigmentation is almost invariably more marked upon the dorsal side of the sac (*i.e.*, towards the direction from which the light usually falls), and varies (inversely) in intensity with the degree of external protection from illumination.

Those regions of the body-surface which are not liable to direct illumination do not need to be protected from it, and are therefore comparatively unprotected by pigment or other agency. A difference in the degree of pigmentation of the dorsal and ventral surfaces of the body is usually observed in the higher animals; the exceptions to this rule are in those animals the ventral surface of which is more freely exposed to light than in others.

We contend that the external pigmentation of animals is, primarily, but one of several agencies serving to protect the enclosed tissues from excess of illumination, that the pigmentation of certain internal tissues

assists in controlling and directing the multiplication of those cells which habitually undergo fission, and that the "intention" of the particular colour selected for the blood of the higher vertebrates is similar to that with which we make use of ruby glass in the window of our photographic dark-room.

The favourite colour-scheme of the animal kingdom comprises those which will best arrest the more actinic rays of the sunlight, and is represented by the series black, brown, red, orange, and yellow. This scheme is reproduced, in miniature, in the races of mankind—with the striking exception of the white man.

The production of pigment in response to increase of illumination is a vital and not a physical process, and is probably an inherent reaction to provide against some consequence dangerous to the organism.

Reflecting and dispersing surfaces, pigment, scales, feathers, hair, posture of body, and light-avoiding habits are among the agencies which protect the tissues of the animal body from excess of illumination. The protecting agencies in man are limited to the pigmentation of his skin. His erect attitude causes him to present the ventral surface—which has, for countless ages, been directed downwards—to direct illumination. In the matter of protection from light man stands isolated in the domain of biology. The white man is the last link in the chain, almost interminable in length, of pigment-controlled and pigment-protected creatures, and—without hairy coat and without colour—he is fitted only for a nocturnal existence. It seems probable that no other animal in its natural state exposes its body so constantly to bright daylight and direct sunlight as does civilized man.

The cells of the body possess peculiarities which for want of better term must be called psychic. They possess the "instinct" for orderly multiplication and behave "instinctively" as their ancestors behaved. The direction of multiplication of epithelial cells was originally, and for many ages, dictated by the presence of pigment; the habit of multiplying away from the site of pigment, or away from connective tissue cells, has now become a very stable characteristic of epithelium. The protection afforded in past times against actinic stimulation has established a very firm habit of leisurely and orderly multiplication in the connective-tissue cells. The traces of pigment in the dermis and epidermis of the white man, and the basement membranes of epithelial structures, probably perform a "mnemonic" function and serve to "remind" the cells of former conditions. The "physiological resistance" of tissues hypothesized by Cohnheim is identical with this principle of cell-instinct-for-direction-of-multiplication.

We may look to find a relative increase of liability to cancer associated with a relative decrease in pigmentation.

Our main proposition is that cancer is the result of the loss by the cell of its "instinct" for orderliness in multiplication, and that this "psychosis" of the cell is consequent upon undue actinic stimulation.

The relative frequency of sarcoma, as compared with carcinoma in early life, is an ontogenetic reproduction of a phylogenetic peculiarity.

To the penetration and stimulation of the tissues by radiant energy we shall apply the term "irradiation." The liability of an organ or region to be affected by cancer is in proportion to its liability to irradiation. Organs and regions (such as the superficial portion of the parotid and the dorsum of the trunk) which have been, in past ages, continuously liable to irradiation, have acquired a partial immunity to cancer. This partial immunity is usually signalled by "latent malignancy" and chronicity of the process. Those organs which are the best protected from irradiation are the least liable to cancer; those which were formerly well-protected and are now exposed are the most liable.

Mammary cancer in the woman is usually due to deficient protection of the breasts from light.

The specially frequent localisation of cancer in those median pelvic structures which lie immediately behind and below the base of the bladder may be due to the dioptric effect of this organ when distended upon actinic rays penetrating the anterior abdominal wall. The light which can so penetrate must be (1) small in amount, (2) in excess of that to which the abdominal contents have been accustomed in all former states, and (3) although invisible, must yet, like visible light, be amenable to concentration in certain localities by spherical refraction.

The selection of the pyloric region of the stomach may be due to the fact that, when the organ is distended with gas, a large portion of this region is in close contact with the abdominal wall in the subcostal angle.

The face, being the most continuously illuminated region of the body, is specially liable to be affected. The marked predilection shown by rodent ulcer for a certain locality may be accounted for by a "retro-illumination" of the skin of this region by light reflected from the globe of the eye and transmitted through subjacent sinuses by trans-illumination.

The relative frequency with which the lower eyelid and the lower lips are affected may be associated with the relatively greater protection of the upper.

The "kangra" cancer of the Kashmiri is due to direct irradiation from an artificial source of light and heat.

The cell's environment usually requires very prolonged illumination from natural sources before the stability of its "instinct" is threatened.

External cancer originates, by preference, at or near the junction of unpigmented with pigmented surfaces, or at the junction of less with more pigmented surfaces; the difference in the degree of pigmentation being evident either in the individual affected or in his near ancestors. "Cell-instinct" is probably least stable in such border zones.

The relatively immunity of transparent epithelial structures, such as the cornea, lens, and mucous lining of the trachea, may be due to the fact that a transparent substance arrests no light and is not therefore affected by illumination in the manner in which translucent and opaque substances are.

The occurrence of subcutaneous (melanotic) sarcoma near the finger or toe-nail of the white man is explained by reference to the pigmentation of the digits of the negro; in the latter we find that this region is a border zone between pigmented and unpigmented regions.

Subcutaneous sarcoma has been observed with marked frequency upon the heel and the borders of the foot of the uncivilised negro. These regions are unprotected by pigment and are border zones.

The liability of the kidneys to cancer during infancy is perhaps due to the relative thinness of the posterior parietes at this period of life, and also to the fact that the characteristic attitude of infancy is the crawling one.

The preference shown by sarcoma for the femur and the neighbourhood of the knee-joint is probably due to the fact that of all regions of the limbs this one has experienced the greatest increase in illumination by the assumption of the erect attitude.

Congenital cancer, sarcoma of the placenta, and deciduoma malignum appear to be consequent upon irradiation of the gravid uterus and its contents.

The increased liability to cancer with advancing years may be due to the final yielding of the cells to long-continued stress of environment, to general depreciation of psychic peculiarities (including cell-instincts), and to reduction in the agencies of protection (pigment and hair).

The essence of racial liability appears to be degree of deprivation of pigment. If the races of mankind be graded upon a basis of colour the relative liability of any one race is represented by its position in the scale.

Cancer has been found to be slightly more prevalent among those who are the more exposed to actinic stimulation—seamen, dwellers besides lakes and rivers, agricultural labourers, masons, etc.

Cancer-houses usually appear to be unwholesome dwellings, often affording special facilities in their immediate neighbourhood for the irradiation of the anæmic inhabitants.

The increase of cancer with the last seventy-five years is perhaps due to diminished protection from light and increased exposure to illumination. Woollen garments have been largely replaced by cotton and black and brown clothes by those of a light colour. Narrow streets and dark houses are no longer tolerated and suburban life has largely replaced that of the city. Artificial illumination has become more actinic; the candle and vegetable oil-lamp have given way to the paraffin lamp, incandescent gas-beams and electric light. The habit of snuffing has yielded to the vastly more prevalent usage of smoking tobacco by means of a pipe.

A manifest deduction from the principles we have advanced is that cancer may be prevented by efficient protection of the body from light. Natural protections, such as hair upon face, to be encouraged. The clothing to be absolutely light-proof. The ventral surface of the thorax and abdomen to be specially protected. The tobacco-pipe to be discarded at thirty-five.

The essential difference between a simple (pathological) hyperplasia and a malignant hyperplasia is perhaps a psychic one—a question of inheritance, or non-inheritance, of orderly instincts by the principal actors. The sites of selection by cancer are also common sites for simple hyperplastic lesions. Prevention of irradiation may possibly obviate both disorders.

From South African Medical Record.



ON SALINE INFUSION AND THE VALUE OF ITS EARLY USE AS A PREVENTIVE OF SHOCK.

By HAROLD BALME, F.R.C.S., Eng.

A well-known London physician used to say that whenever he was called in to see a patient and found a cylinder of oxygen under the bed, he at once made a mental note that the case was already hopeless, as he found that the average practitioner never made use of that valuable form of treatment until it was too late. The same criticism may also be applied, to some extent, to our use of saline infusion in surgery, and it is with the object of emphasizing the value of an earlier use of this method that the following notes are written.

The action of normal saline solution, when injected into the human tissues (whether intravenous, subcutaneous, or by rectum) can be divided into three classes:—

Firstly, as a means of supplying the deficiency of a depleted circulatory system, such as occurs, for instance, in a morasmic infant wasted by acute diarrhoea, or a patient who has had a severe hæmorrhage.

Secondly, as a direct stimulant of the heart-muscle.

Thirdly, as a diluent of toxins circulating in the blood, as in septicæmia, general peritonitis, etc.

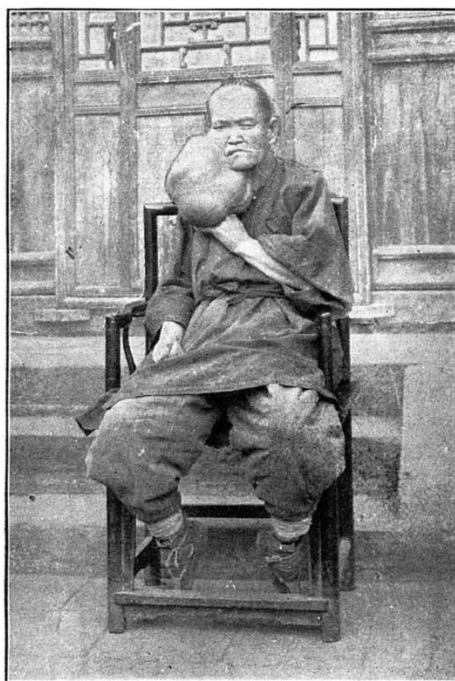
It is with the second of these groups that these remarks are more particularly concerned, and especially in relation to surgical shock. Many are the theories which have in turn held the field as to the precise nature and pathology of shock and as to the direction which our efforts should take in attempting to combat this subtle foe. The one thing which seems clear is that the most important effect of this condition (whether primary or secondary in origin need not here concern us) is a marked depression of the heart's action, and, for this reason, the various forms of treatment which are at present in vogue, by the use of drugs, of electricity, of massage, etc., are all employed as direct cardiac stimulants. It may be that subsequent investigation, and the elucidation of the new facts, will expose our present methods to ridicule, on the score that they have been directed towards a secondary symptom instead of a primary cause; but, for the time being, it seems that we are well advised in directing our attention to the weak, flickering heart and pulse.

Of the various forms of stimulant which are recommended in this condition, it has always seemed to me that saline infusion possesses one marked advantage over ordinary drugs in that, although somewhat slow of application, its effects appear to be much more lasting. The

precise nature of its action, where the heart has not been weakened by loss of fluid, or poisoned by circulating toxins, is somewhat obscure, but there seems to be little or no doubt that the arrival of a considerable quantity of a bland fluid into the circulatory system provides a new and sustained stimulus to a heart which is beginning to flag and fail.

If this be the case, and knowing as we do that it takes some little time for the stimulus to act, why wait until our patient is well-nigh pulseless before we attempt to use so potent a remedy? Should we not rather employ this as one of our first methods of treatment in cases where we anticipate the occurrence of severe shock? The following two cases will serve to illustrate this point :

CASE I.—*Gangrene of the leg after septic compound fracture.*—About a year ago a young man of 22 was brought to Taiyuenfu Hospital in a truly deplorable condition. Three weeks before, he had sustained a compound fracture of the left tibia and fibula, just below the knee. This had been treated by Chinese doctors with tightly-bound strips of wood; moist gangrene had followed, and on his arrival at the hospital the whole leg was one moving mass of maggots. The lad had a running pulse, almost imperceptible to the touch, and in his feeble, cachectic condition it seemed that even amputation was not to be considered. Attempts were therefore made to limit the absorption of toxins by the use of local antiseptics and at the same time to try and build up his strength by the administration of a liberal diet and suitable tonics. But after a few days it was evident that the absorption of so much sepsis was having far more effect upon him than all the food and drugs with which we could supply him, and he was obviously becoming weaker and weaker. It was therefore felt that his one and only chance lay in amputation through the thigh, though in his almost pulseless condition it seemed but a forlorn hope. On the morning of operation his condition was so desperate, and the chances of his dying of shock in the theatre so enormous, that before even administering an anæsthetic we decided to infuse intravenously. This we accordingly did, injecting between four and five pints of saline, and not commencing the operation until his heart showed good signs of reaction. There was a marked improvement in the pulse after an hour's injection, and we then felt justified in giving him ether and performing the amputation. All through the operation one of our senior students was continuing the intravenous injection, and with such satisfactory results that at no time did any symptoms occur to cause undue anxiety or hinder the operation. The patient left the theatre with an infinitely



A LARGE ADENOMA.

[See Page 339.]

better pulse than when he entered, and although we kept a very close watch upon him for the first day or two, and felt it wise to give repeated stimulants at regular intervals, he never showed the least signs of anything approaching severe shock, and his recovery was uninterrupted and complete.

CASE II.—*Removal of one-half of lower jaw for large sarcomatous growth.*—This patient was a man of 41 years, suffering from an enormous sarcoma of the left side of the lower jaw, which had expanded the bone to such an extent as to cause complete absorption of the whole alveolar margin of the left superior maxilla from pressure-atrophy. The growth extended upwards under the zygoma to the margin of the coronoid notch, whilst, in a downward direction, it was well below the level of the thyroid cartilage. Here also the bone had given way in one place, and the skin was already slightly involved.

The patient was an opium-smoker and in a very poor general condition, and it was with no light heart that the excision of such a tumour was contemplated. Profiting, however, by the experience of the former case, reported above, it was again decided to commence proceedings with a preliminary intravenous injection of saline solution. This having had the desired effect of markedly improving the pulse, the operation was then begun. A flap was turned up over the cheek, the bone sawn through just to the left side of the genio-hyoid muscles, the mucous membrane divided and the joint disarticulated; the whole growth being thus removed with all infiltrated tissues. There was a moderate amount of hæmorrhage at one period in the operation, but the patient's general condition remained most satisfactory throughout, and at no time did he cause us the slightest anxiety.

As a contrast to the above two cases, one may briefly record a third, where these precautions against shock were not adopted. As will be seen by the accompanying photograph, the patient was an old woman (of 53) with an enormous tumor growing from the right parotid region. She too was a feeble old body, but as the tumor was evidently encapsulated and freely movable on the deeper structures, no special difficulty was anticipated, and unfortunately no preliminary measures adopted beyond the preparation of a quantity of saline solution in case of need. With Dr. Paula Maier's kind assistance the operation was then proceeded with; an enormous elliptical incision being made from the malar bone to the sternal end of the clavicle, and back to the lobe of the ear. The tumor (which was a huge adenoma, weighing 9 lbs. 4 oz.) shelled out without any special

difficulty beyond the fact that a great number of large vessels ramified on its capsule, and we were just commencing to fasten our ligatures when the patient became absolutely pulseless. Injections of strychnine, ether and digitalin were all made use of whilst intravenous infusion was being commenced, but for the next two or three hours the patient's condition was desperately critical, and it remained very much the same throughout the day. Personally I believe it was the saline infusion which actually saved her at the immediate crisis, but I cannot help believing that had one adopted this method earlier, as in the two preceding cases, we might have been saved one of the most anxious days we have probably ever spent. This patient also was an opium smoker, and her condition naturally got very much worse at the time when her opium was due, but we found that a preliminary injection of digitalin shortly before her opium effectively prevented an aggravation of her symptoms of shock at such times. Her subsequent recovery was uneventful.

Cases like the above seem to suggest that we do not always get the full value that we might out of this form of treatment in cases where surgical shock is feared, and may not the same also be said of the third group of conditions in which saline infusion exercises an important action, namely those in which it is employed as a diluent for toxins circulating in the blood. It is but a few years ago that general septic peritonitis was regarded as an invariably fatal condition, but since the adoption of the semi-upright position and of continual irrigation by means of subcutaneous injection, not a few patients have been saved. Why should not this principle be extended? Personally I should like to see it extensively tried in all cases of profound toxæmia, such for example as occur in cerebro-spinal meningitis, typhus fever, etc., etc. Lumbar puncture, accompanied by the withdrawal of a certain quantity of cerebro spinal fluid, has already been attempted on several occasions for the former condition, and it is common knowledge that such fluid is found to be permeated with the meningococcus and its toxins. And although the specific organism of typhus fever has not yet been isolated, the course of this fever makes it fair to infer that here also we have to fight against virulent toxins circulating in the cerebro spinal fluid. Is it not therefore feasible that the withdrawal of a certain amount of such fluid, combined with prolonged or repeated injections of saline solution into the tissues, might have a very beneficial effect in such conditions, not merely by virtue of diluting the intensity of the poisons present, but also by supplying an effective stimulus for the enfeebled heart-muscle?

ON RUPTURE OF THE UTERUS.

By J. PRESTON MAXWELL, M.B., F.R.C.S.

Rupture of the uterus is one of the serious complications which may at any time meet a practitioner in a country where obstetric practice is as yet in its infancy.

It is also a subject which has been modified very much by the introduction of antiseptics. It is not the intention of the writer to enter into the reasons for rupture; these are discussed fully in the text-books, but the diagnosis and treatment are subjects which still admit of fresh consideration.

As regards the diagnosis one of the cardinal signs is the stoppage of pains, even though the child has not escaped from the cavity of the uterus.

The uterus cannot be felt as a contracted swelling unless the child has passed either out of the uterus, or, in the case of an incomplete rupture, into the rent still covered by the peritoneum.

Besides this cessation of pains there is prostration of the patient quite out of proportion to any hæmorrhage that can be seen; there is recession of the presenting part in part or completely and a varying amount of hæmorrhage generally bright in colour. There may also be a history of obstructed labour, or of treatment such as would be likely to rupture the uterus, though it is a marvel what some of these women are able to stand in the shape of protracted and obstructed labours.

Treatment is of two kinds—prophylactic and curative. The first named is by far the more important. Barring the rare forms of rupture, such as those taking place in pregnancy, or of the form narrated in the first case given below, provided that the medical man is called to the patient early enough, he should be able to save his patient from this grave event. An obstructed labour should never be allowed to drag on, but, even at the cost of the child if necessary, terminated quickly. But in China at all events the medical practitioner generally is not called to these cases till the mischief is already done.

First, a clear distinction must be drawn between the cases where the child is yet in the uterus and those where it has passed into the abdominal cavity. Second, the question of the cause of rupture must be taken into account. The presenting part may be within reach, and yet if the obstruction is such as to cause a great difficulty in delivery, and the child is still mostly in the uterus, it may still be the better plan to perform abdominal section and remove the child by this route.

Where the child has passed completely into the abdominal cavity, it is best to perform abdominal section and extract this way. Where the child has not passed into the abdominal cavity, and there is no serious obstruction, it is best to extract by the vagina, reducing the size of the child in any way that will make delivery most easy. The delivery of the placenta, even if this has passed into the abdominal cavity, can be accomplished per vaginam by pulling gently on the cord. Of course if the abdomen has been opened for the delivery of the child the placenta is also removed by this route.

Having extracted the child, what is the next step? If the extraction has been by the vagina the writer's advice is as follows: Pass up the hand carefully cleaned as usual and determine the nature of the injury. Replace the bowels and omentum which may have prolapsed into the uterus. This must be done with the greatest gentleness. Pass up a sterilized gauze packing and adjust it as far as possible to the uterine surface of the rent. Give a strong hypodermic injection of ergot and leave the gauze in its place for 24 hours, unless it comes away earlier. Give the patient ergot three times a day and open the bowels freely on the evening of the second day, preferably with a saline purge.

It will be noticed that the writer advises no attempt to be made to extract bloodclot and wash the rent. Probably any attempt to douche the inside of the uterus, especially in dirty Chinese homes, involves a considerable risk. Germs may easily be introduced, and the peritoneum is able to deal with a considerable amount of bloodclot, provided it does not become infected.

If the extraction has been by the abdomen, the course to be pursued depends on the condition found. If the woman is septic, and the rupture a serious one, probably the best practice would be to remove the uterus and drain the pelvis from the abdominal wound, placing the patient in Fowler's position as soon as the shock has passed off.

If, however, the operation has to be carried out outside a hospital, the writer would content himself with sponging out, not irrigating, the abdomen, and draining the lower part through the abdominal wound and the adoption of the Fowler position as soon as possible.

In hospital, and if the rupture is in front, it may be sutured, but this must be done accurately if it is to be of real use, and may take a considerable time, and it is to be remembered that one of the chief dangers to the patient is that of shock, and that if, as is likely, the patient is already exhausted by a long labour every minute is of importance.

On Rupture of the Uterus.

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The two cases now to be narrated comprise those met with by the writer in the last nine years in which there was any chance of treatment. It is no use discussing those sad cases to which one is called when they are beyond any treatment, and where the diagnosis is not made from actual internal examination.

The first was a woman aged 23, in an ordinary Chinese home, who, however, had placed herself in the hands of the writer entirely, so that the whole labour, although in dirty surroundings, was conducted antiseptically. She had a placenta prævia marginalis, and just as the child was being delivered by the woman's own efforts, the uterus tore in a longitudinal direction; the rent extending up through the cervix and well into the lower uterine segment. The bleeding was very severe for a short time, but was checked by rapid expression of the placenta and administration of ergot, both by the mouth and hypodermically. The rupture was a complete one, but no bowel actually entered the uterus.

The rent was packed with gauze wrung out of biniodide of mercury solution and the uterus was kept under observation for two hours, at the end of which time the patient had begun to rally. The gauze was removed at the end of 24 hours, setting up a little recurrent hæmorrhage, which soon spontaneously ceased. No douche was given throughout and the puerperium was uneventful. The child was a living one. A year and a half later she was again confined of a fine child, which unfortunately had died from some unknown cause shortly before birth. Labour was normal and the puerperium was uneventful. She died of plague in her third pregnancy, but except for the scar in the cervix the uterus was apparently normal.

The second case was that of a fifth-para aged 34. She had arrived at full term, and the writer was called to her at 5 a.m. Labour had commenced at 4 p.m. on the previous afternoon. At 8 p.m., she called in a "wise" (?) woman, who pulled down an arm and tried to deliver by pulling on this member.

At 2 a.m., no progress having been made, a half "foreign"-trained midwife was called in. She tried to put back the arm as far as the writer can ascertain by sheer force. What really happened is shrouded in mystery, but she became frightened and sent for help, probably partly because she had already caused indirectly the death of two transverse presentations in the last two years, and knew that the writer had expressed himself very strongly in the matter.

The patient was found standing by her bed, with an anxious expression and a small thready pulse. The uterus was acting very

feebly, and the presentation was easily made out by abdominal examination; the head being in the left iliac fossa, back to front, and the right shoulder well down. The arm was prolapsed, the hand and part of the forearm outside the vulva. When this was moved a little bright red blood flowed away. The child was dead. Chloroform was given and decapitation performed with a Ramsbotham's hook; the body having been delivered, the head was steadied over the pelvic brim and a Braxton Hicks' cephalotribe applied, the ends of the blades not being passed beyond the head. There is no need to do so in these cases, and the head was delivered without difficulty.

Nothing abnormal had been felt on passing the blades, but on the delivery of the head a piece of omentum, 3 inches long by 1 inch wide, was found to have been cut off and pinned against the head by the blade of the cephalotribe which had been passed up the right side of the pelvis. The placenta, which had evidently been detached some time, followed the head, and the membranes, although torn, were entire.

Passing up one's hand the uterine cavity was found to be full of small intestine and omentum, and there was a large transverse rupture some three inches long about the place where the lower uterine segment joins the upper. The room was a dark and dirty one; more than half filled by the big bed, but the friends refused to have the patient taken to hospital. The bowels and omentum were restored by hand to the abdominal cavity, and about 6 feet of sterilized gauze 6 inches wide was passed up to the region of the rent, but not into it. A strong dose of ergot was given hypodermically, followed by another dose by the mouth, and thereafter for the first three days a dose of ergot, equal to about 20 minims of the *tinctura ergotæ ammoniata*, was given every six hours; the object being to keep the uterus firmly contracted. A dose of salts was given at the end of 48 hours, and the gauze came away about 24 hours after delivery.

With the exception of complaining severely of after pains, the patient made an uninterrupted recovery, and is now at work in the house strong and well. No douche of any kind was given, and the stump of the cut omentum was never seen, and left to take care of itself, as it was clear from inspection that there were no large vessels involved.

**BATTLE CREEK SANITARIUM AND AMERICAN MEDICAL
MISSIONARY COLLEGE.**

By J. H. MCCARTNEY, M.D., Chungking.

I never had the privilege of visiting the sanitarium and its latest philanthropic venture—the American Medical Missionary College—until a few weeks ago, when as the invited guest of the sanitarium I went to attend the meetings of the American Medical Missionary Association, the first meeting of the kind ever held in America. I consider it one of the greatest treats that has fallen to my lot to have had that privilege and to become acquainted with that fine Christian missionary philanthropist, Dr. J. H. Kellogg, and to become acquainted with the workings of and clearly understand the aims and objects of the institution known as the sanitarium.

This has been a grossly misunderstood institution, and Dr. Kellogg has been represented as a mercenary person rather than the kind, charitable physician and surgeon that he is. I had always looked upon Dr. Kellogg as one of America's leading physicians and recognized that the stand which the profession has taken in the use of alcoholics in the treatment of disease was due as much or more to Dr. Kellogg than any other one man, but never having met him or seen any of his work I could not appreciate him as I do now after having had this opportunity.

The word sanitarium was a new word coined for this institution forty years ago when it began operations. Its foods and methods have been widely copied both in America and Europe, but never equaled. Many have sprung up, but none have prospered as the Battle Creek Sanitarium, for the very good reason it is the only one of its kind that can claim to be purely missionary in its operation, whose profits are used for the relief of suffering humanity. The first year it was in operation it cared for 106 patients; in 1896-97 the number was 2,800; its patrons numbered 7,006 during 1906.

The object of the founders of this institution in devoting all earnings to its equipment, operation, and betterment of the institution were, to use their own words:—

First. To put into actual, effective, and systematic use every practical method which modern medical science has provided for the accurate determination of deviations from the normal standard of health in structure or function, and for the estimation of the amount of such variations, so far as possible expressing these variations by means of co-efficients so as to make exact comparisons possible.

Second. To make available, in most approved form, every rational curative means known to medical science, so that the same may be brought to bear in any individual case, giving special prominence to physical therapy, or so-called physiologic therapeutics.

Third. To combine with the special professional, technical, and institutional advantages of the modern hospital, the luxuries and comforts of the modern hotel, adding the genial atmosphere, security, and freedom of the home, characteristics which constitute the genuine sanitarium.

Fourth. To organize and carry forward various lines of research, having for their purpose the improvement of the conditions of human life, especially in relation to diet and nutrition.

Fifth. The organization and maintenance of various charities, especially hospitals and dispensaries for the treatment of the sick poor.

The care of the multitudes of patients requires 800 to 1,000 attendants, including 30 physicians, 200 nurses, and bath attendants. Insane, epileptic, and tuberculosis patients are not received; the patrons are mostly those suffering from chronic gastric and nervous disorders. The treatment does not consist so much in the use of drugs (although drugs are used when indicated) as the physiologic methods, which are becoming more accepted as we understand disease better and treat it more scientifically.

They do not follow any routine, but treat disease on the theory that "it is the blood that heals," and they do this by means of a proper diet, baths, and physical exercise, based on the experience of thirty years. How successful they have been is attested by the thousands from all parts of the world who not only visit to learn but come to be treated each year. The main building, which was opened in 1903, has accommodation for 400 guests, offices for 30 physicians, treatment rooms capable of handling 1,000 patients, dining room for equal number, gymnasium (120×66), a palm garden, and is built of brick, stone, and Portland cement.

For each patient on entering they have what they call the three days' research. The patient is put on a diet not only sterile, but free from all tissue wastes, so there is no question respecting the origin of the several constituents found in the urine. A physician is in constant attendance on the patient at meals, to see that the diet prescribed is carried out. Each patient is subject to test for blood-pressure, blood count, feces, gastric, and urinary examinations. These records are all type-written and filed in cabinets, afterwards

Battle Creek Sanitarium.

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placed in fire-proof vaults, where records of cases years ago are to be found.

Here it is that we find organized hydrotherapy practiced in the most scientific way, yielding all that is claimed for it by the use of 200-odd kinds of baths, and worth a long study in itself.

Phototherapy and thermotherapy are extensively employed, as well as manual Swedish movement or medical gymnastics, which last I find was introduced by Ling, of Sweden, from a translation in French of an ancient Chinese book, wherein are methods employed by Chinese in training soldiers for war (proving what the Chinese hold, that the present is not equal to the past). The so-called osteopathy is a modification of Swedish movement.

Space forbids describing the many other methods and treatments employed in this model institution, but we must mention the diet system. No meats of any kind are allowed; after a time their absence is not missed. We have the fruit and nut diet, blood building, fattening, fat reducing, fever, laparatomies, and many others. The food supply is under the supervision of food specialists.

I would like to mention a few of the diseases in the treatment of which diet plays so large a part: Digestive disorders of all kinds, gall-ducts, gall bladder, constipation, neurasthenia, insomnia, migraine, locomotor ataxia, Bright's disease, obesity, etc., etc.

A religious atmosphere, such as I have never seen in so large an institution before, is maintained; this is a delight when one sees so much in hospitals that are anything but religious, and where religion is tabooed as not being conducive to the rapid recovery of a patient.

All the health foods found on the market to-day are imitations of the sanitarium food. One man has made a fortune out of a cheap mixture of bran and molasses.

I can recommend this institution as being the nearest to the ideal for those seeking health from among the missionary body. The charge to missionaries for treatment, room and board, is only \$5.00 per week (within the means of any in need of such treatment).

I would like to say a word as to Dr. Kellogg's surgical ability. Most persons have the impression that he only does medical work; not so, he has a very large surgical practice, and he has a custom which might serve as a model for Christian surgeons throughout the world. After the patient is fully under the anæsthetic, and just before the operation begins, he always bows his head in a moment of audible prayer, asking God's blessing upon the operation.

The missionary medical college is affiliated with the sanitarium, and its students get the full benefit of the operations and other facilities furnished by the sanitarium. At the present time there are nearly fifty young men and women enrolled as students, preparing to enter foreign work when finished. The facilities furnished for the teaching of medicine are second to none. The students are sent to Chicago for their dissecting and clinical work, outside of what they are able to get in the sanitarium, and, taking all in all, a young man who finishes in their college will have had a more thorough training than is possible in the average medical school of this or any other land. With such teachers as Dr. Kellogg, whose interest in each student is personal, they cannot help but be greatly benefited. The laboratories are complete in every detail. They have the advantage of Christian surroundings, which will greatly strengthen and help those who are preparing for medical missionary work, and which they cannot get in any other medical college.

TWO SHORT CASES.

By RUTH B. MASSEY, M.B., CH.B., Wuchang.

CASE OF INTESTINAL FISTULA.

The patient, a girl of 12, was brought to the out-patient department on March 22nd, 1910, with a sinus in the right lumbar region, running forwards, upwards and slightly outwards, with a somewhat vague history of three or four years' duration. The child was rather thin, but did not look very ill. In-patient treatment was refused, but the child was brought back in the same condition and taken into hospital on April 8th. On this occasion the relative who brought her said that some worms had passed on one or two occasions by the wound, but the history was extremely indefinite and the woman herself had not seen them. The child was kept in hospital several days and dressed daily, there was a discharge of pus from the wound, but no fæces and no fæcal odour was noticed. One day she had a severe attack of pain. The next day chloroform was administered and the sinus was enlarged and explored. It was found to run upwards and forwards just below the last rib, which could be felt, but which was healthy. There was no sign of spinal mischief. On enlarging the sinus the under surface of the liver could be felt, and that also seemed healthy. The direction of the sinus had suggested the possibility of an old liver abscess, but the colour

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of the pus was against such a diagnosis. A drainage tube was inserted and a dressing applied. The child seemed well after the operation, and the dressing was not changed until the second day. Then before the bandage was removed a very strong fæcal odour was noticeable, and on removing the dressing there was not only fæcal matter, but three *ascaris lumbricoides*. The wound was washed out and dressed and *santonin* was administered. At the next dressing more than ten *ascarides* were found in the wound and drainage tube. *Santonin* was repeated and the wound was dressed night and morning. For several days the child had violent attacks of pain, but the temperature kept normal, and there was no sign of peritonitis, though there was some tenderness in the right hypochondriac region. At the third dressing about seven or eight *ascarides* were found in the wound; after that they gradually decreased in number, though for four or five days, one, two or three were found at each dressing. Many of the parasites were alive; some were large, others quite small. During this time practically no pus or fæces escaped from the wound, which kept quite sweet and showed signs of healing. The attacks of pain ceased when the parasites ceased to be passed. While *santonin* was being administered two or three parasites were passed per rectum. The motions appeared healthy. The large drainage tube was taken out after the wound had been free from *ascarides* for a few days and a smaller one inserted, which was also taken out as healing progressed. But though for a time healing advanced well, fæces began to be passed from the wound. The child remained in hospital until May 31st, when the friends insisted on taking her home. The general condition was on the whole improved, and no parasites had been seen for about six weeks. The friends entirely refused to let her remain longer or to allow an operation for repair of the fistula. One would be glad to know of other such cases and what are the prospects of spontaneous closure of such a fistula or at what period it would be well to attempt closure by operation.

CASE OF OVARIAN CYST IN A CHILD OF EIGHT.

A little girl of eight, the child of well-to-do parents, was brought to the out-patient department on February 25th, 1910, complaining of a swelling in the abdomen and pain. The child was very pale and somewhat thin. Examination showed a distinct tumor in the lower part of the abdomen, slightly to the right of the middle line. The tumor was about the size of a cocoanut, moveable and tense. Treatment as an in-patient was urged, but the mother refused to let her stay.

On March 4th the child came again to the dispensary. Since the first visit she had had severe pain, so that for a day or two she had not been able to stand upright. A Chinese doctor, who had had training in a mission hospital, was called in and applied fomentations which relieved the pain, but he was not allowed to examine the abdomen. He, however, urged coming into hospital for operation without delay, and acting on his advice and that of other enlightened friends the mother gave her consent to the operation. On examination after admission there was some tenderness; the tumor was less freely moveable and more to the right side than before. The tumor had only been noticed for one or two months.

A few days later the child was put under chloroform and the abdomen opened by a median incision. A tense cystic tumor was found occupying the lower part of the abdomen. It was to a considerable extent covered by mesentery, which was adherent by soft recent adhesions, which were readily sponged off. A trocar was inserted, and a little brownish fluid came away, but on connecting the tube with an aspirator the flow at once stopped. The trocar was then withdrawn, the opening clamped and the trocar inserted into another part of the tumor, but with the same result as before. However, when, detached from the aspirator some three or four ounces of fluid slowly drained away. As it seemed impossible to very much reduce the size of the tumor, the abdominal wound was enlarged and the tumor drawn out. It was free from adhesions, but the pedicle was long and was much twisted. The pedicle was clamped and tied and the tumor removed. No trace of another ovary or of a uterus could be made out; the pedicle of the cyst could be traced deep into the pelvis. The abdominal wound was closed and the child made an uninterrupted recovery, leaving hospital in three weeks. She was seen later; the scar was firm and the child's general condition was improving.

After examination of the tumor showed it to be a unilocular cyst. A delicate network of fibrin was floating in the ovarian fluid, and no doubt accounted for the difficulty in draining the cyst owing to blocking of the trocar. At the lower part of the cyst there was a solid tumor, which proved to be dermoid, containing hair and a small piece of bone.

REPORT OF THREE UNUSUAL CASES.

By J. H. MCCARTNEY, M.D.

CASE No. 1.—A male child, five years of age, greatly emaciated, was brought to the out-patients' department, with the following history: Had had measles about three months previous, and for past two or three weeks was troubled with greatly distended abdomen, pain and temperature, with all the symptoms of peritonitis. The umbilicus was protruding and presenting all appearance of going to rupture. We decided there was pus within, but before opening used an exploring needle to determine if this was so. On inserting the needle a mucopurulent material exuded with a markedly fecal odor. We accordingly enlarged the opening, and great quantities of fæces were expelled, which greatly relieved the child. That same night it passed five round worms through this opening, and the next day, when he was brought to the dispensary, a round worm was protruding from the opening—making six in all. The child died about one week after. How the worms succeeded in escaping from the intestinal canal I am not prepared to say, as no autopsy was held. It only serves to show that the round worm is not so inoffensive as is generally thought.

Dr. Maxwell in his report as chairman of the Research Committee states: "We are very sceptical of any effects beyond the purely mechanical result of the presence of a foreign body in the intestinal canal and reflex irritation that such may lead to."

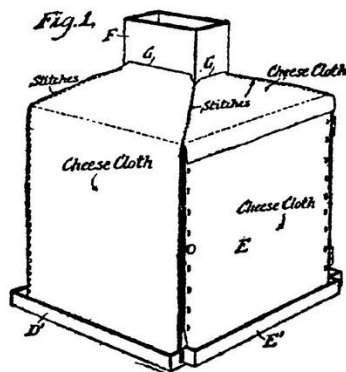
CASE No. 2.—Adult, male, 50 years of age. Incomplete inguinal hernia on right side. Gave following history (as near as you can get such a history from a Chinaman): About one month ago a swelling in left inguinal region became painful, and finally ruptured, through which several round worms were passed. Since then he has been passing small quantities of fæces through the opening constantly. It was evidently a strangulated hernia, which ruptured and the worm passed in the ordinary course of events.

CASE No. 3 is that of *Balantidium Coli*.—According to Braun this parasite has only been reported five times before in this part of the world, and that in Cochin China. This patient, who had been temporarily insane, came into the hospital to be treated, and it was while following our customary routine, that of examination of the fæces, that we accidentally discovered the parasite.

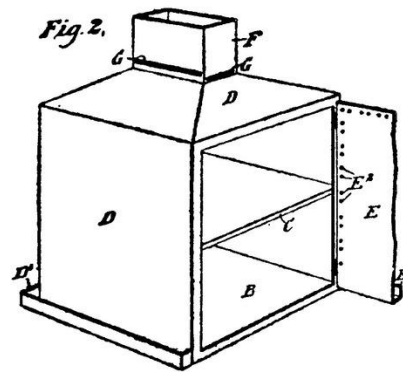
He presented no symptoms out of the ordinary. His fæces were literally alive with the parasite, each field containing 6 or 8. They were exceptionally active, darting in all directions across the field.

ICELESS REFRIGERATION.

While the mad race for supremacy between the mercury and price of ice continues, much comfort can be taken in the fact that there are other methods of keeping victuals cool besides that of melting ice in an ice box. If in changing from the solid to the liquid state water absorbs sufficient heat to keep an ice box cool, it is equally true that a change from the liquid to the gaseous state will result in refrigeration, provided, of course, the rate of vaporization keeps pace with the heat which enters the ice box from the outside atmosphere. Under proper conditions it is possible by this method to maintain a sufficiently low temperature in the ice box to preserve food from rapid decay. A simple method of making such an iceless refrigerator is illustrated in

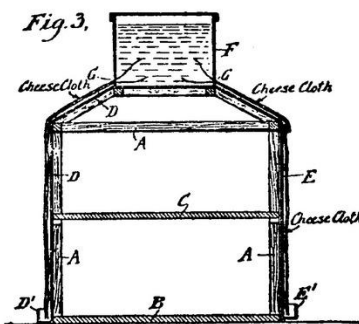


Refrigerator complete with tank uncovered.



Cloth removed to show the zinc box.

Fig. 1. In this illustration the cover of the water tank is removed. The box comprises a frame *A*, which is built upon a wooden floor *B*.



Cross-sectional view of Refrigerator.

The frame *A* serves as a support for a zinc box *D*, which is fastened thereto. The water tank *F* is soldered to the top of the box, while at the bottom is a trough *D*¹. The door *E* at the front of the box has its own trough section *E*¹. Slots *G* are cut in the four sides of the tank *F* to receive the ends of a cloth cover for the box. The cover is preferably made up of several thicknesses of cheesecloth stitched together at

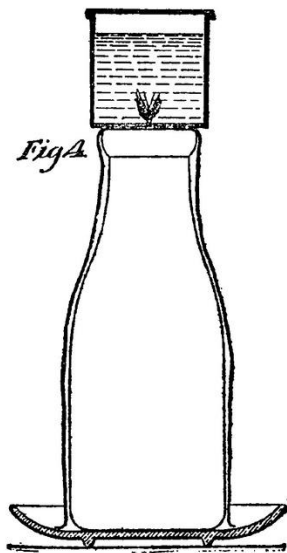
Iceless Refrigeration.

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the corners, and the ends are jammed tightly through the slots into the water tank *F*. The door *E* is provided with its own section of cheesecloth, as indicated in the illustration. In operation the water from the tank soaks into the cheesecloth, and by capillary attraction and gravity passes on down to the bottom of the cloth, where any excess of water is caught in the trough. The flow of water through and over the cloth should be very slow, and may be regulated to a large extent by the tightness with which the cloth is stuffed into the slots *G*.

The box is placed on a suitable shelf, supported by brackets, just outside of the open window on the breeziest side of the house and out of the direct rays of the sun. It is advisable to make the box a

couple of inches narrower than the window opening, so that the currents of air passing in and out of the window may have free passage all around the moist cheesecloth. As the water in the cheesecloth is evaporated it absorbs a large amount of heat, much of which is taken from the zinc box, tending to keep the food in the box cool.



How to keep a milk bottle cool.

A modification of this idea is shown in Fig. 4. Here the construction is adapted to cool an individual milk bottle. The cloth covering is placed directly over the bottle, and at its upper end is jammed into a slot in the bottom of the small reservoir. The milk bottle is placed in a saucer, which serves as a trough to catch the excess of water. Instead of the cheesecloth covering, the leg of a sock can be used, as this is already of cylindrical form and is well

adapted to hold the moisture. In case the water from the tank does not moisten the cover sufficiently, the trough may be also filled, and the water will be drawn up therefore by capillary attraction. —EDWARD THORPE in *Scientific American*.

"THE AMPUTEE."

A FORECAST. CIRC. A.D., 1970.

The surgery was empty, and the dresser had begun
 To believe at last his arduous and daily task was done,
 When the gloomy portals opened and a case was carried in
 On a stretcher; and the porter woke the dresser with a pin.
 Then they who bore the stretcher in, the dresser thus addressed :—
 " Fell off, sir, of an aerobus as was a' flyin' west,
 An' 'it a gyro-tram, sir, in the middle o' the Strand,
 Wot sent 'im through a winder, an' we think 'e's 'urt 'is 'and."
 And the dresser answered, " *That* I can entirely understand."
 Examination showed a dislocated finger; . . . and
 A fracture of the cranium extending to the base
 From the vertex, and complete obliteration of the face;
 Embedded in the sternum were the patient's upper teeth,
 And the lower jaw was afterwards discovered underneath;
 One femur was impacted in the corresponding lung,
 But was happily unbroken as the man was fairly young.
 But the fact that struck the dressers was that several vertebræ
 Were inextricably mingled with what once had been a knee.
 I should mention too, in passing, the aorta could be seen
 At the bottom of a hollow where the stomach should have been;
 The heart was palpitating with a diastolic "knock,"
 And the patient was concluded to be suffering from shock.
 They summoned up in haste Sir John McHernia Perowne,
 Who was readily accessible by wireless telephone.
 (He had made his reputation on excision of the heart,
 And on pons varoliotomy was first to make a start.)
 The surgeon at this point arrived, the same Sir John Perowne,
 Whose skill and fame already I have partially shown.
 So it took him little time to turn it over in his mind
 And decide on amputation of a complicated kind.
 On the details of this piece of work I cannot enter now,
 Nor the technical description of the "wherefore" and the "how."
 Six hours the operation took, the final stitch was sown,
 And he rested from his labour, did McHernia Perowne;
 And the patient opened up the conversation with a groan.

Now amputations hitherto had left it fairly clear,
 And to casual observers it must obvious appear
 That it's easy to distinguish which is A, the patient, and
 Which is B, the part removed from him, an arm, or leg, or hand;
 But a singular dilemma now confronted Dr. P.;
 He was really not quite certain which was A and which was B.
 For B, or what he thought was B, had horrified Perowne
 By indulging in a totally inexplicable groan;
 While A, or what he thought was A, seemed very like to die;
 Its pulse was four a minute, and its temperature high,
 Its breathing was a raucous gasp that ended in a sigh.
 Then said Sir John McHernia, the great Perowne, quoth he,
 " Please put the patient *both* to bed, and then perhaps we'll see
 Which is the amputated part and which the amputee."

Some say that A was first to die and some say it was B.

In Consultation.

KULING, January 14th, 1910.

DEAR SIR: The following is a memo of a case which I saw recently with a colleague, in consultation, and which the patient and his friends said was Hankow fever because when some friend had a similar illness the doctor at that time called it Hankow fever, etc., etc.

I would like to enquire through your columns whether or not there is such an entity known as Hankow fever. Has it been described? If so by whom? I have not succeeded in getting any additional light on the subject, which I would value greatly.

The symptoms noted were as follows: Patient, aged 42, was admitted to the hospital on the twenty-first day of his illness, which appears to date its onset to a light exposure while on a snipe-shooting expedition in one of the marshes about Kiukiang. A dry troublesome cough set in, with a sense of discomfort not amounting to pain experienced under the left shoulder-blade. This discomfort did not last more than twenty-four hours. There was no fever or expectoration, and a dose of aspirin appeared to set him right. In twenty-four hours, however, the disagreeable symptoms returned; cough was troublesome, he felt drowsy, lost his appetite, and felt disinclined for duty. An erythematous rash appeared on the trunk and limbs which faded and disappeared in twenty-four hours. Chilly sensations were experienced, which were constant; his face burned, and the thermometer now revealed an afternoon temperature of 102 Fah., which was soon seen to be of a distinctly quotidian type, having a daily range from 97 to 103 Fah. The cough practically disappeared on going to bed, though a slight expectoration continued for a few days and then ceased entirely. The temperature curve continued to show a subnormal condition early in the morning, which by eleven was normal, and at two or three o'clock in the afternoon it registered 102 or 103, when a gradual defervescence took place, which was occasionally followed by a drenching night-sweat. The sweats were only very occasional, perhaps four during the whole course of the disease.

During the first three weeks in bed the patient lost probably twenty pounds in weight. The pulse continued regular, it was full and very compressible, and ranged from 72 to 100 per minute, while

respirations varied from 18 to 24 per minute. The facies usually presented a flushed appearance, and at any time there was no suggestion of pallor, icterus, or distress. There was no dyspnoea nor was pain felt anywhere in the body throughout whole course of disease. The patient complained very little, and apart from a sense of weakness was cheerful. Though early in the course some flatulence was present; the appetite remained remarkably good. The tongue was coated; with white fur, except the tip and edges. Patient complained of a dry mouth throughout, and with the exception of the first week has slept well.

Examination of the lungs revealed the presence of congested patches. There was dullness on percussion and breathing was distant in areas. There were no rales or friction sounds detected. Thoracentesis failed to discover fluid in the right pleural cavity, where the symptoms were suggestive. The heart appeared normal. The spleen and liver were perhaps slightly enlarged. Urinalysis revealed a slightly lessened daily output. The urine was heavily loaded with urates, but contained neither sugar or albumen nor yielded the Diazo reaction. Microscopically nothing unusual was observed.

The Widal reaction was absent and malarial organisms were absent from the blood. Leucocytosis was present; the total whites numbering 25,000 per c. mm. A striking feature was the presence of an eosinophilia, these cells constituting 35 per cent. of the white cell. There was also a large increase in other neutrophiles. There was no anæmia present and the hæmoglobin was normal in amount. The examination of the sputum was negative. Calmette's and V. Pirquet's tests also failed after repeated trials.

Note the absence of pain or other discomfort such as headache, etc.; failure to find fluid in the pleural cavities or pus in the liver. The marked eosinophilla, the urine loaded with urates and the prolonged quotidian type of fever which failed to respond to hydrotheraphy and perhaps only slightly to heavy doses of quinine. The temperature curve ranged from 97 to 103 Fah., for thirty-two days, when it began to fall by lysis, requiring two weeks more to reach normal, at the end of which time the patient was apparently quite himself again, excepting that he was considerably thinner than ordinary. The initial rash is also interesting.

I am, yours sincerely,

H. G. BARRIE.

Report of Customs Surgeon.**REPORT ON THE HEALTH OF KIUKIANG IN 1909.**

By DR. A. C. LAMBERT.

Although 1909 was an unhealthy year in the Yangtze Valley yet the settlement and port of Kiukiang remained remarkably free from epidemic disease. This in part was due to the fact that most of the women and children in the port, particularly those of unmixed European parentage, removed to the hill station of Kuling before the hot weather arrived. It is interesting, however, to note that there was very little sickness amongst the children who remained down in the plain, the majority of whom were of mixed Asiatic and European parentage.

TABLE OF THE FOREIGN POPULATION.

Adults, European and American	{	Males	48	(1 Eurasian).		
					Females	35
Children, European and American	{	Males	9			
					Children, Eurasian...	{
...	{	Males	4			
					...	{
Japanese	{	Adults ...	...	{		
					Children	...
	{	Males	2			
				{	Females	0
Totals, 119						

Two births occurred during the year; one being still-born. Two deaths took place amongst the residents of the port; one a Japanese from cholera, the other an infant from chronic diarrhoea. Of preventable diseases may be noted one case of cholera, one of malaria in a Chinese, three of tuberculosis—one European, one Chinese and one Eurasian. Several cases of mild diarrhoea were treated amongst the foreign residents and the Chinese members of the Customs, and two cases of ptomaine poisoning amongst the foreign staff of the Customs, one of which was due to the ingestion of tinned ham, the other to putrid cheese. Amongst foreign children the following cases were treated: rickets, three cases in one family—one of the cases being complicated with genu valgum. The occurrence of rickets amongst foreign children in China is interesting when compared with the comparative immunity which the native child enjoys in this direction. Flat foot and a tendency to scoliosis is rather noticeable among the chil-

dren here, due no doubt to the lack of any form of systematic exercise. The inauguration of drilling and dancing classes would help to 'set up' these young people and improve their general health. Adenoids are very common.

It is interesting to note that cases of malaria arising *de novo* in the settlement are never met with; all cases treated during the past year having been previously infected in other localities which the patients have but lately left. None of the older residents suffer from malaria, nor is the parasite present in their blood. *Anopheles (myzomia sinensis)* are fairly common in the neighborhood, but none of those examined have been found infected. Neither does malaria seem to be prevalent amongst the Chinese in the city and the surrounding country; many cases of fever diagnosed as such on microscopical examination have been found to be non-malarial. On the other hand unclassified fevers are very common, particularly at the changes of the seasons—in early summer and late autumn. Some are three-day fevers, some the seven-day type, while some are relapsing fever, pure and simple, and should not be included in the group of the unclassified except that it is often not possible to demonstrate the presence of the spirillum obermieri. In no instance has any protozoal organism been found in the body fluids in the first mentioned types. Examination of *fæces* also negative. The mortality of these fevers is practically nil, but they are distinguished by being followed by a tedious convalescence out of all proportion to the severity of the attack. The infective agents do not appear to be transmitted by fomites or direct contact with the sick, but seemingly act locally, as it is often noted that several cases will come from the same village, though when in hospital the disease is not transmitted by them to other inmates. This would point rather to the infective agents being carried by insects, etc. The majority of these cases have been treated at the St. Vincent's Hospital, a dispensary for indigent Chinese, under the management of the Catholic mission, but in addition a few foreigners have been treated for fevers of from three days to a fortnight in duration. These fevers were certainly neither typhoid, malaria, nor Malta fever. Symptoms consisted of headache, often quite severe, lassitude, constipation and coated tongue, pains in the back and limbs, and profuse sweatings. There was never any rash, and the symptoms were quite unlike those of influenza or dengue. Blood examination showed a leucocytosis and nothing more; convalescence usually rather tedious and requiring the aid of tonics. Roger's "saddle-back" temperature was not noticed, the morning temperature being generally a little above normal, the evening reaching 101 to 102.

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Pulse rarely above 80. Foreign patients were usually able to read or otherwise pass the time in bed, but were quite done up on the slightest exertion.

Another and very interesting type of fever is one which has been described several times by practitioners in the river ports, but so far as is known its cause has not been discovered. This fever is distinguished by the appearance during its course of an urticarial rash. Three cases were treated in Kiukiang in 1909, but only one patient was a resident of the port, the other two coming from men-of-war for hospital treatment, having contracted the disease in Changsha, or its vicinity, a place where from all accounts it is rather prevalent. These patients were all foreigners. Natives are said to suffer from similar rash with fever, but the occurrence in them has not been noted in this port.

The disease commences with a feeling of being below par for a day or two. The temperature, on being taken, is found to be elevated at night from one to three degrees, rarely more, dropping to normal in the morning. With the commencement of the disease, or at all events in the course of two or three days, an urticarial rash of a giant nature makes its appearance. The individual wheals come out on any part of the body, develop rapidly into tumescent areas, 3" to 4" or more in diameter, slightly raised above the surface of the surrounding skin, dead white in colour, except in the centre, which has a pink tinge, and at the edges, which are marked by a rosy areola. They are accompanied by more or less itching and remain out for varying periods, usually for two or three hours. When fading the central portion regains the normal skin appearance first, the areola remaining visible longer, so that an effect is produced of a series of sinuous red lines. No discoloration or desquamation follows the rash. On the face the eruption takes the form of tumescence of the eyelids, lips, the skin over the malar bones, and of the nose, so that considerable, though transitory, changes may be made in the patient's physiognomy. The same areas of local œdema occur on the mucous membranes of the mouth, fauces, larynx, and nares; sometimes causing embarrassment to breathing, but never to a dangerous extent. There is little doubt that the same fleeting changes take place in the alveoli of the lungs and the mucosa of the alimentary tract. The further symptoms point to such being the case, for most patients suffer from cough or diarrhœa, or both combined. Neither the cough nor the diarrhœa seem to have any special relation to the presence or absence of the

cutaneous eruption, though some patients say that they feel better when the rash is out and, vice versa, scanty rash means more cough and gastric distress.

Auscultation and percussion of the lungs show areas of dulness and diminished intensity in the breath sounds throughout these areas; the preliminary formation of such patches being heralded by fine crepitations, not unlike those of the earliest stages of pneumonia. These areas alter in position, from day to day, the affected portions of the lungs returning to normal in the course of a few hours. Expectoration, when present, is scanty. No organisms which could be connected with the symptoms have been found in it. Pulse is slow in proportion to the height of the fever. Heart normal. Gastric symptoms, when present, may be quite acute and distressing. The tongue is coated with a thick yellowish-white fur; anorexia is pronounced. There may be either diarrhoea or constipation. If the former the stools are usually of a dysenteric type, frequent and containing blood and mucous, the passage of which is attended by a certain amount of pain and tenesmus. Examination of the stools for helminths has, so far, proved unenlightening. In one case bodies like filaria, but of various lengths, were found in the honey-coloured mucus from the bowel. Sheath-like bodies lay beside them. These objects were motionless when seen. Bodies and sheaths stained badly with hæmatoxylin and showed no formation. They were found in one case and on one occasion only.

The blood shows a pronounced and increasing eosinophilia, which may reach as high as 40 cent. Mononuclears are slightly increased, 6 per cent. to 8 per cent. In the early stages there is a leucocytosis, but this is replaced if the disease drags on by a leucopenia; the total whites falling to 6,000 per c.m. or thereabouts. At the same time there is usually a reduction in the red cells of a million or so in the c.m. The hæmoglobin in the above cases was not estimated, but clinically the grade of anæmia appeared less than that associated with benign malarías. No parasites of any kind were discovered in the blood, though a careful search was made of wet and dry specimens taken at all times of the day and night. An examination of the fluid from the wheals was also negative.

A clinical feature to be noted in the more severe type of case, that is to say, one which lasts longer than a fortnight, is the persistence of the fever. This is of a remittent type, normal or nearly so in the morning and rising to 101 to 103 in the evening; defervescence taking place in the early hours of the morning to the

accompaniment of sweating. The pyrexia may last for a long time after the wheals have ceased to make their appearance, in fact it is rare for the latter to make their daily eruption after the end of the first fortnight.

Complete return to health is the rule, however, though in some cases it may be six weeks or longer before the temperature becomes quite normal. Convalescence is extremely slow, the patient regaining his wonted health and energy very slowly, though his appetite is usually excellent and his sleep sound. Drug treatment is extremely unsatisfactory; the most useful preparation would seem to be quinine given in moderately large doses, grs. 20 to grs. 30 daily. Other remedies are salol, calcium chloride, calomel, and salines. Santonin is usually exhibited. For the itching of the eruption ical baths are useful. Tonics are indicated during convalescence, the best of which is arsenic.

Although apparently not a fatal disorder, still the fact of its being sufficiently severe to invalid a patient for two or three months makes the elucidation of its cause a thing to be desired.

In addition the symptoms may be very misleading and give rise to a diagnosis of tubercle, typhoid, Malta fever, etc., and it is only when repeated examinations and tests are negative to these disorders that the practitioner begins to believe that he is dealing with a new and distinct entity amongst diseases.

Having analysed the histories of several cases from different places on the river, the writer puts forward the theory that there is a connection between the mud of the rivers, creeks and paddy fields and the cause of this fever. In nearly every case, and they all occurred in men, there was a distinct history of the sufferer having brought his bare skin in contact with stagnant mud a few days previously to the onset of the symptoms. Thus the cases occurred amongst sportsmen who had waded bare-legged through the paddy in the autumn or late summer, and amongst blue-jackets who for various reasons had been paddling about in the mud on the river banks.

It would appear that clothing of moderate thickness acts as an effectual bar against the action of the infective agent, for sportsmen and others who wade in the water well clad in putties or leggings seem to escape. Thus it would seem that the infective agent—bacterium, protozoon, nematode or whatnot—might be introduced into the economy through the bite of some fly or water insect, etc.

It is to be hoped that medical men will turn their attention to this interesting subject.

Several cases of sickness and some deaths occurred on board the river steamers passing through the port. Two cases of cholera were landed for treatment at the St. Vincent's Hospital. Both were treated by continuous saline infusions through a makeshift apparatus ingeniously devised by Surgeon Leslie Barford, R.N. Both died; one within twelve hours, the other on the fifteenth day from pneumonia and parotitis.

Dysentery was severe in the native city, but did not attack the settlement. It was of a particularly virulent bacillary type, and deaths were numerous. A few cases, landed for treatment from vessels in the harbour, did well under a combined ipecacuanha and saline treatment, with lavage with saline enemata.

The settlement is, on the whole, in a sanitary condition. There is too much vegetation, and the drainage system is not complete. This is to be remedied this year by the Municipal Council.



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The yearly subscription to the China Medical Missionary Association is \$4 Mex., payable in January of each year. This includes the JOURNAL and postage on the same, whether local or foreign.

All changes of address, departures on and arrivals from furlough should be notified to the Secretary and to the Presbyterian Press. Members are requested to invite new comers to join the Association.

The Editors will be obliged if all those who are building hospitals will send copy of plans and detailed description (in duplicate if possible). These will be loaned, on application, to members who are proposing to build.

Editorials.

"WHERE ARE THE HOSPITAL PLANS?"

PHILADELPHIA, June 13th. 1910.

DEAR DOCTOR :

You add as a postscript to your letter, "Where are the Hospital Plans? I have had many calls for them." Let me explain to you and to those who thirst for the same the whereabouts and condition of that much overrated collection. In the first place it never did amount to much. The plans were collected by yours truly from the JOURNAL files and from private sources for the benefit of members of the association who might wish to see them, and I used to mail them on request to individuals living anywheres from Moukden to Hainan and from Korea to Chentu. They were kept by each for several months and were never available when wanted. There was no order or explanation of them, and they oftener proved a misleading measure than otherwise to the new members who vainly sought their crumbs of help. The mistakes of former plan-makers were not pointed out and no explanations of any kind were available.

My first idea of a collection developed into a plan on my part to write a paper to go with them, and print it with illustrations from the old and from new blocks, and use that instead of the bulky and faulty collection, but this was blocked by the great expense of making cuts of the many plans which were on blue-prints, etc., and needed entire redrawing before they could be photographed. The expense would have been very considerable.

So this scheme fell through. (N. B.—I was not seeing my way to personally financing the idea, and naturally no one else was sufficiently interested.)

My final decision was to incorporate the matter as a separate chapter on hospitals and hospital construction (fully illustrated) in Dr. Maxwell's and my book—*The Diseases of China*—where the collection, the best of it, will appear in what I trust will prove a really helpful form. The book is more than half way through the press and will be in China before the New Year. When Messrs P. Blakiston Son & Co. are through engraving from the original plans I shall be very happy to place them again at the disposal of the long suffering editors of the JOURNAL. Meanwhile I regret the delay.

I think I hear you asking if reprints of that paper will be available. I regret to say that they will not be, except as enclosed in the larger work.

Fraternally yours,

WM. H. JEFFERYS.

THE EAST CHINA UNION MEDICAL COLLEGE.

On May 17-18, a meeting for furthering the establishment of the above institution was held at Shanghai. The outgrowth of preliminary meetings and actions of three years was the presentation of the following resolutions and basis for establishing the college:—

RESOLUTIONS.

I. *Whereas:* There is an urgent need in China for Christian medical schools, giving instruction in the Chinese language, and

Whereas: Such institutions require for their proper conduct a force of teachers and an equipment ordinarily beyond the means of any single Mission Board,

Resolved, That we earnestly recommend to the missions working in this section of China that they unite in the establishment of a thoroughly efficient and well-manned union medical school, and that they be strongly urged to avoid the establishment or continuance of schools inadequately equipped and insufficiently manned.

The adoption of this resolution was moved by Dr. Venable, seconded by Dr. Woods, and unanimously carried.

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II. *Whereas*: Nanking has the combined advantages of accessibility, the Mandarin dialect, position both as a government and educational centre, together with the fact that the medical students would be under exceptionally good moral and religious influences and

Whereas: by locating the school at Nanking, the coöperation of a larger number of missions can be secured than is possible elsewhere, be it

Resolved, That the missions concerned be urged to take immediate steps toward the establishment of an East China union medical school to be located at Nanking.

The adoption of this resolution was moved by Dr. Garritt and seconded by Dr. Evans.

Dr. Babington moved and Dr. Kember seconded an amendment to substitute "Hangchow" for "Nanking." After a free discussion by Drs. Davis, Garritt, Davenport, and others, the amendment was lost and the original motion was carried.

On reassembling on May 18th, Dr. Garritt moved the following:—

Resolved, That the present meeting of representatives of the Church Missionary Society, Presbyterians North, Presbyterians South, Disciples, Baptists North, Baptists South, Methodists North, Methodists South, American Episcopal, and Seventh Day Adventists, recommend the following basis of union to their several missions.

This motion was seconded and carried.

The articles of the provisional basis of union were then considered *seriatim*, and the following was adopted:

PROVISIONAL BASIS OF UNION.

I. NAME.—The name of this institution shall be the East China Union Medical College. The Chinese name shall be.....

II. PURPOSE.—Sec. 1. The aim of this institution shall be to give thorough instruction in modern medicine and surgery to the Chinese in their own language and under Christian influences and thereby:

- a. To provide mission hospitals with capable Chinese physicians.
- b. To furnish Christian communities with well-trained native physicians
- c. To train Chinese for positions as instructors and professors in this and other medical schools.
- d. To assist in providing this Empire with a Christian medical profession.

Sec. 2. It is also hoped that this institution, while primarily for educational purposes, will take an active share in the investigation of diseases peculiar to China, the study of their causes, and the determination of methods for their prevention.

III. COÖPERATION.—Any Christian missionary society receiving the endorsement of the board of directors, subscribing to and complying with the requirements of the constitution, may become a participator in this union, and shall be then known herein as a "coöperating party".

IV. ULTIMATE COST.—The establishment of this college shall proceed upon the understanding that the ultimate cost of the needed buildings and outfit will be at least fifty thousand dollars (gold).

V. BASIS OF REPRESENTATION.—Sec. 1. Any missionary society may acquire one share in the medical college by meeting the following conditions :—

- a. Contributing \$2,000 gold towards land, buildings and equipment.
- b. Providing one member of the faculty and his residence.
- c. Contributing for current expenses a sum not exceeding \$300 gold per annum.

Sec. 2. Any society may increase its contributions of men and money, and shall then have a correspondingly increased representation on the board of trustees; the trustees of any one society not to exceed three in number.

Sec. 3. Any coöperating party may retire from this union on the following conditions :—

- a. Such retirement may only occur at the end of five year periods, beginning from the organization.
- b. The party wishing to retire shall give one year's notice of its intention; this notice to be presented to the board of trustees at its annual meeting.
- c. For its share in the property of the college, exclusive of specific gifts to the institution, the retiring party shall be reimbursed with such funds and in such manner as shall be considered equitable by the board of trustees after conference with representatives of the retiring party.

VI. BOARD OF TRUSTEES.—Sec. 1. The board of trustees shall consist of members duly appointed by the coöperating parties. Each coöperating party shall be represented by one trustee for each share for which it has assumed responsibility. The term of office of trustees shall at least three years.

Sec. 2. The duties of the board of trustees shall include :—

- a. When duly authorized they shall act as legal representatives of the several coöperating parties and shall hold in trust all properties belonging to the institution.
- b. The management of the property and the holding and disbursement of the funds of the institution.
- c. The election of dean and treasurer of the college, and, in the first instance, of the faculty.
- d. The election of professors on nomination by the faculty.
- e. General oversight of the curriculum and regulations of the institution, together with the issuing of diplomas on the recommendation of the faculty.

VII. FACULTY.—Sec. 1. Members of the faculty shall be elected by the board of trustees, a three-fourths vote being necessary for election. To be eligible for the faculty the person proposed must be :—

- a. A graduate of a professional school of recognized standing and well qualified to teach in some particular department.
- b. Of Christian faith and character, accepting the Word of God as the supreme rule of faith and practice, and agreeing to teach nothing inconsistent with evangelical Christianity.

Sec. 2. Physicians not appointed by any of the coöperating parties may be elected by the board of directors as members of the faculty, provided they are specially fitted for instruction, are endorsed by the faculty, and can meet the requirements in Sec. 1.

Sec. 3. Any member of the faculty may be retired for justifiable cause by a three-fourths vote of the board of directors.

Sec. 4. The faculty shall consist of all professors and associate professors.

Sec. 5. It shall hold regular meetings once each month, shall have general management of the instruction, and shall present an annual report to the board of directors.

Sec. 6. The faculty may delegate the details of its duties to an executive committee, which shall consist of the dean, treasurer, secretary, and two other members of the faculty.

VIII. COURSES OF INSTRUCTION.—Sec. 1. All regular courses of instruction shall be given in the Chinese language. Special courses may be given in English at the discretion of the faculty.

Sec. 2. The standards of admittance and instruction shall be determined by the faculty, and shall be as nearly as possible equal to those in European and American schools.

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Sec. 3. All students applying for admission shall produce satisfactory evidence as to their good moral character. Christian students shall present testimonials as to their Christian standing from the pastors of the churches to which they belong. The admission of non-Christian students shall be so regulated that a Christian majority may be maintained.

Sec. 4. The course shall extend over a period of 5 years of 32 weeks of instruction each, and in addition one year of internship in a hospital approved by the faculty.

IX. RELIGIOUS INSTRUCTION.—Daily chapel exercises shall be held in the college building. Courses of Bible study shall be included in the curriculum. Every effort shall be made to maintain in the student body a distinctly Christian atmosphere.

X. DIPLOMAS.—At the conclusion of the entire course, each student having completed the studies and passed satisfactory examinations shall, upon recommendation of the faculty, be granted the diploma of the East China Union Medical College.

The following was moved by Dr. Garritt :—

Resolved, That while adopting the foregoing basis of union, we do not attempt to bind the missions to it in all its details. Our hope is that the missions concerned will find it sufficiently satisfactory as a tentative basis and defer minor amendments or alterations to the board of directors after its organization, and in this way avoid unnecessary delay in the establishment of this medical college.

Seconded by Dr. Woods and carried unanimously.

Dr. Davis moved that a committee consisting of Drs. Stuart, Shields, and Brown be appointed to edit the minutes of this meeting and prepare a statement for the missions, home boards and churches, to be printed and distributed to interested parties.

STATEMENT TO THE BOARDS AND MISSIONS.

In the beginnings of medical missionary work in China the value of the medical missionary as a door opener cannot be overestimated. By his wonderful cures he broke down prejudice, and so opened the way for himself and his associates to preach the Gospel. But the value of this aspect of medical missions must, from the nature of the case, pass away as the people become more enlightened. There is no doubt that the foreign doctor and his work, as a concrete example of the love of God as preached by the Christians, will still be needed for many years. But in recent times there has been a great development of the idea of the educational value of medical missions. There were a few pioneers who undertook the training of classes of students, but no large, well-equipped medical schools were projected until within recent years. The formation of the Terminology and Publication Committees of the China Medical Missionary Association gave a great stimulus to medical education, and

the need for well-equipped schools is now universally recognized by missionaries on the field.

At present the opportunity to prosecute this work still rests with medical missions. But this will not continue long if not improved. Government and other schools, manned by non-Christian, not to say agnostic and atheistic teachers, are being established. Given well-equipped schools, established under the auspices of medical missions, we can draw and hold a very large portion of the students. If we do not have such schools, even our Christian students will be forced to attend schools having a decidedly non-Christian influence.

We put forth this statement in behalf of our missions in China; in behalf of the young men who may be educated in such a medical college and thus be brought to know the truth; in behalf of the untold numbers who may through them be healed of their bodily infirmities and brought to know Him who is able to heal their souls. We would urge our Home Boards to ratify this proposed union as the most economical, and withal the most effective, method of conserving this medical missionary work, and as furnishing an example to the Chinese and to the world of the essential unity of Christian missions. We appeal to the friends of missions in England and the United States to aid us in the establishment of this college that it may help toward the evangelization of this great empire and toward the day when the foreign missionaries will be able to hand over their work to the Christian ministers, teachers, and physicians of China.



Medical and Surgical Progress.**Gynecological Notes.**

Under the charge of KATE C. WOODHULL, M.D.

The Relation of the Thyroid Gland and Thyroidism to the Toxæmia of Pregnancy.*

In the December, 1909, number of *Surgery, Gynecology, and Obstetrics*, George Gray Ward, Jr., M.D., has a long and very interesting paper on the above subject. Below is given an abstract.

Since Parry first clearly described a case of undoubted exophthalmic goiter, seen by him in 1786, to the present day there have been a great variety of theories advanced by numerous contributors to medical literature in an endeavor to solve the riddle of the thyroid gland in both its physiological and pathological aspects. While important advances in our knowledge of the thyroid gland and its diseases have been made, yet there still remains much that is obscure; in fact the lifting of the veil by recent investigators has simply sufficed to show us how complex a problem still remains for solution.

What has just been said of the thyroid gland may be applied with equal force to the problem of the toxæmia of pregnancy. That there is some relation between the thyroid gland and pregnancy is an accepted fact. That there is some relation between the diseased thyroid and some of the metabolic disturbances of pregnancy, is strongly probable.

The results of the investigation of recent years have placed the thyroid gland and the parathyroids as vital organs. The complete removal of the thyroid and the parathyroids in mammals results

in tetanic convulsions and sudden death in the great majority of cases. The removal of the thyroid alone produces a general cachexia. This condition can be relieved by the administration of thyroid substance. If the parathyroids are completely removed, an acute fatal tetanus results in a few hours. The functional importance of the thyroid apparatus seems to be greatest in early life. Wagner has shown that if one alone is removed the other hypertrophies; this is constant in young animals, and shows the importance of the gland in the economy. The thyroid secretion in some way exerts a profound influence upon introgenous metabolism. When the function of the gland is active, there is a decided increase in tissue changes, while if it is deficient, these changes are diminished.

Sajous and Hutchingson found that thyroid tissue fed to normal dogs causes a slight increase in the urinary nitrogen excretion, and this influence soon disappears on the withdrawal of the thyroid substance.

A larger output of purin-nitrogen and a low output of phosphorus were observed after the continued administration of large doses of thyroid tissue.

Chemical studies of the gland have shown that the proteid can be separated into nucleo proteid, thyreoglobulin, and albumin.

It is probable, according to recent investigations, that the parathyroids elaborated an internal secretion which is of vital importance. The tetany, which is the result of the complete removal of the para-

*Thesis presented for fellowship in the American Gynecological Society, April, 1909.

thyroids, is not unlike the symptoms of tetany and clampsia in the pregnant woman. That a disturbance of these functions may have an important relation to the toxæmia of pregnancy is not improbable, but as yet the subject is too little understood, and we must await the results of further experimental work.

It is now acknowledged, both physiologically and clinically, that the thyroid gland normally hypersecretes during pregnancy and that a moderated degree of hypertrophy is the rule.

As the metabolism of the body is greatly increased during the pregnant state, and as the function of the thyroid gland is closely related to the metabolic processes, it is reasonable to consider this hypertrophy of the gland as a normal accompaniment, in order to keep the system sufficiently supplied with iodothyron by an increased functioning power of the gland.

GRANES' DISEASE,

There have been advanced two theories as to the manner in which Granes' disease is caused, both of which have been made the basis for a cure of the disease by serum therapy. The majority of the efforts have been based upon the assumption that the chief function of the thyroid secretion is to neutralize a toxin which arises in the course of metabolism.

The second theory as to the etiology of Granes' disease is based upon the proved fact that normal thyroid secretion is toxic, and that the symptoms of the disease are produced by an excessive secretion of the thyroid, or an overdose of the normal product of the gland. This is known as the hypersecretion theory.

Some of the arguments in favor of the hyperactivity of the thyroid

as the main factor in the production of Granes' disease are as follows :—

1. Feeding thyroid gland symptoms and metabolic changes quite similar to those of Basidow's disease.
2. The gland, in the vast majority of cases, is enlarged and hyperæmic.
3. Removal of a portion of the gland will, in many cases, effect a cure.
4. Recurrence after operation is, in most cases, accompanied by a recurrence of the tumor.

A study of the relation between Granes' disease and pregnancy, and also the puerperium, was made by Theilhaber in 1895. He found that the majority of coincident cases of pregnancy and Granes' disease were made worse by the disease, and that a minority were improved by it. Kleinwachter claimed that the atrophy of the uterus, ovaries, and breasts, which was not unfrequently observed in Granes' disease, made pregnancy impossible, but Theilhaber saw a patient who became pregnant after several years of such atrophy. Theilhaber states that pregnancy favors the development of Granes' disease, and will usually increase an already existing case. A goitre may take on so exaggerated a development during pregnancy that asphyxia is threatened and tracheotomy is necessary. In some cases the tachycardia was greatly increased, and was lessened after the labor. In some cases, however, a decided improvement of the symptoms was observed during gestation. This improvement of Granes' cases by pregnancy may be accounted for by the increased metabolism made necessary by the growing fœtus, requiring an increased amount of thyroid secretion, and thus the exact secretion resulting from the Granes' disease is utilized and less of it remains in excess to produce the characteristic symptoms of hyperthyroidism. Likewise when the labor is terminated in these

*cases, we find that the symptoms of hyperthyroidism at once return or are increased in severity.

CONCLUSIONS.

1. The thyroid gland is, in all probability, concerned in promoting introgenous metabolism.

2. There is considerable evidence that the thyroid gland normally hypertrophies during pregnancy and plays an important part in the increased nitrogenous metabolic processes incident to that state.

3. It is very probable that the toxæmia of pregnancy is largely dependent upon faulty metabolism; at least an insufficient metabolism is an accompaniment which greatly adds to the seriousness of the condition.

4. Failure of the thyroid gland to hypertrophy during pregnancy is probably followed by insufficient metabolism, and may result in the various forms of toxæmia of pregnancy.

5. Granes' disease, by materially altering the quantity and quality

of the thyroid secretion, has an important influence upon metabolic processes, therefore if associated with pregnancy, owing to the increased metabolism incident to that state, it becomes a grave complication.

6. When there is a failure of the normal hypertrophy of the thyroid gland during pregnancy, and when there is a diseased thyroid, as in Granes' disease, the administration of thyroid substance, by supplying the deficiency of the normal thyroid secretion and by diuretic action, may materially improve a faulty metabolism, and thus have a favorable influence upon the manifestations of the toxæmia of pregnancy.

7. The use of a saline extract of thyroid proteids, made from normal human glands, is much more efficient in rapidity and reliability of action than the sheep thyroids as ordinarily prepared.

8. The hypodermic administration of thyroid proteids is greatly superior to oral administration, especially when used in cases of toxic vomiting of pregnancy or eclampsia.



Correspondence.

EMMANUEL MEDICAL MISSION. }
NANNING, Feb. 25, 1910. }

DEAR SIR: I do trust that the question of "Divine Healing," raised by Dr. W. H. Dobson in your January issue, will lead us medicals to consider this important subject afresh. The testimony of so many who have been miraculously healed of incurable diseases is, I believe, too overwhelming to be put aside. Are we not in danger in any case of being "material" in our methods? We are only too liable to become mechanical in our prescriptions, and unconsciously exclude Him who "bore our sicknesses and carried our sorrows."

I heard Bishop Brent go so far as to say that even "Christian science" was a "righteous reaction" from the "materialism" of the medical profession in America. Reactions and extremes, however, are unhealthy, and the middle line of truth is the safe and scriptural course. Let us more and more make our Master Jesus the partner in all our ministry of healing: "His touch has still its ancient power."

Though the Lord does even now, I am convinced, without doubt, heal our ills without any extraneous aids, yet spiritual experiences differ; God's dealings are never 'cut and dried' like man's; we cannot make occasional experiences the pattern for all others. The Israelites were once or twice commanded "to stand still and see the salvation of God;" at other times they were told to use the weapons at their command and fight. Because this axiom is forgotten, much of the so-called "divine healing" to-day is spuri-

ous and unlike anything of the kind in Scripture. The Lord does not teach us to despise human means if these are laid at His feet. He uses them. It was "the sword of the Lord and of Gideon" that wrought victory for Israel.

So often in the Bible miracles were performed, and at the same time means were sanctified by being used, though in themselves obviously inadequate. For instance, Naaman was ordered to wash his leprous skin in the running waters of Jordan; Elisha stretched his warm healthy body upon the cold lifeless form of the little lad; Hezekiah was instructed to "take a cake of figs and lay it for a plaster upon the boil;" even our Lord put a clay poultice on the eyes of the blind (clay is, as we know, a valuable agent for reducing pain and inflammation), and lastly St. James exhorts "the elders of the church to anoint the sick with oil in the name of the Lord," but though almost any sickness would be benefited by the prescribed anointments of olive oil, he emphasises "the prayer of faith that shall save the sick." Divine miracles therefore do not exclude human "means" and vice-versa. The same Lord who said to the Israelites: "I am the Lord that healeth thee," also said: "The Lord your God He it is that fighteth for you." If the first promise necessarily exclude drugs, the latter would have prohibited the use of weapons in their wars. Scripture commends the Samaritan who applied an antiseptic and emollient on the wounds of his "neighbour," but condemns King Asa for trusting alone to the "physicians." Medicine was once at least distinctly ordered when

St. Paul prescribed a tonic for Timothy's indigestion and the "infirmities" produced by his weak stomach. Our poor sinful bodies are prone to breed all kinds of diseases, and must not be compared to the spotless body of our sinless Lord, who surely never needed medicines.

Though pain and sickness abound, means of healing abound with them, and the dock grows side by side with the nettle. Even my cat, I have noticed, has the instinct, when it is ill, to go into the garden and select a plant to eat and produce vomiting and consequent comfort! It is painful to see people, otherwise intelligent and sensibly, trying to satisfy this instinct of self-preservation, not by using prepared remedies lying at hand (no, that would be want of faith"!), but by stuffing themselves to excess with certain articles of every-day diet, and this they consider quite legitimate! This constant straining after means that they think are not classed as "drugs" is very unrestful and certainly not apostolic. "It seemed good," said the early church, "to the Holy Ghost and to us to lay upon you no greater burden than these necessary things, that ye abstain from meats offered to idols and from blood and from things strangled and from fornication, from which, if ye keep yourselves, it shall be well with you."

What right has anyone to add to Scripture and place *drugs* in this category of prohibitions, excluding them, at the same time, from "*every creature of God*" which "is good and not to be rejected if received with thanksgiving, for it is sanctified through the word of God and prayer."

Much that is called "divine healing" is no *healing* at all; a man or woman is ill and lies up in bed, refuses medicine, but is assiduously

nursed and dieted until either the patient or the disease is worn out. The prolonged sickness is referred to as the "Lord's testing the body," and I have even heard a poor little infant's ailments designated as such by an anxious friend!

The saddest part of all this spurious "healing" is the contempt that it heaps on the name of Christ; the world looks on and sneers at its absurdities, and is indignant when children for instance are forbidden relief from medicine and compelled to suffer. They may well ask, as they do, How it is that the diseases, proclaimed as cured, are almost always those obviously under the influence of "faith," and troubles, such as decayed teeth, not controlled by the mind, are put into the hands of the dentist?

It is no wonder that where these principles are practised the death rate is unusually high and many valuable and devoted missionary lives are lost; in recent years three workers holding these views in this province have died from smallpox alone. Because we lovingly and earnestly protest against these errors, we none the less believe that the "prayer of faith" is as potent to-day as in ancient times, but the devil is as keen now as ever and still deceives the unwary as an "angel of light." What is sometimes called "divine healing" is, I fear, often actually "devil hindering," considering how frequently the best men are kept from their work through sickness that might be easily cured, or have to retire from the field altogether.

We are told that the ills that flesh is heir to all come from the devil, and that the Lord bore our sicknesses as well as our sins in His body on the cross. How far these doctrines are true or not does not affect the question at all, and cannot justify anybody in "com-

manding to abstain from meats which god hath created to be received with thanksgiving by them that believe and know the truth."

A traveller on foot in a strange land, burning with fever and thirst, stumbled upon a stream from which he drank eagerly, even though the water was bitter; higher up a cinchona tree had fallen across the stream, through which the water percolating had extracted its life-giving properties, not only refreshing the traveller but healing his fever. The marvellous medicinal properties in the animal, vegetable and mineral world around us do not detract, when we rightly use them, from the glory of God, "from whom cometh down every good gift and every perfect boon."

No good man ever embraces an error because it is an error, but because of truth in it, denied by others, and it is the rejection of the miraculous by so many, to-day, that drives earnest men to affirm that they will allow the Lord to deal with their physical infirmities only by miracles, and that any "lower" standard than that dims our faith and hinders His power!! My object in writing this letter is to plead that if these brethren are mistaken and limit God in one direction we must not allow ourselves to limit Him in the other! He can and does glorify Himself both through the natural and the supernatural according to His sovereign will.

I am, yours sincerely,
H. LECHMERE CLIFT.

NANKING, China.

DEAR SIR: I have just attended the opening of Dr. Cochran's hospital in Hwaiyuanhien. This town is 450 li, or 175 miles, north by west from Nanking, and I rode on

a good horse. The road is pretty well along the course of the Tientsin-Pukou railway, and the nearest station to Hwaiyuan will be at Penpu, about 10 miles away. Hwaiyuan is a large mart on the Hwai river and an important centre.

The Central Presbyterian Church of New York supports the mission work at this centre, and has sent out all the workers. Dr. and Mr. Cochran and their families, Mr. Lobenstine, Mr. Morris, and the three Misses Murdock. Dr. Cochran has, for seven or eight years, been doing excellent medical and surgical work in straw-roofed native houses. He has removed about 200 stones from the bladder or urethra.

Now Mr. Lobenstine, Sr., of New York, has built an excellent up-to-date hospital, costing \$19,000 and \$8,000 for furnishing and et ceteras. The hospital faces east and is in the shape of an H, with wings east and west.

The operating room is especially light and modern. The floors are cement, the furniture complete, and the sterilizing room is fully equipped.

The lower floors of the hospital are of cement. The beds are the Lawson-Tait bed. Scrolls and fire-crackers were sent by many representative officials, gentry, and merchants. The first day of the opening there was a feast and reception for the officials and literati. Li Wei-yuen, the magistrate, is especially noted as being one of those rarities in China—"a clean officer." After an address by Dr. W. E. Macklin on the objects of this munificent gift to the citizens of Hwaiyuan, a suitable response was made by the magistrate. Afterwards an elaborate shark's fin feast was served. Next day a feast was given to the scholars, merchants, etc. The third day was devoted to a feast for the Chinese Christians.

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The people of Hwaiyuan are lucky in having such an accomplished man as Dr. Cochran, with such a well equipped plant for work. May many a man of means follow the example of Mr. Lobenstein and build other good hospitals.

W. E. MACKLIN.

MOUKDEN, May 23, 1910.

DEAR SIR: Last week my teacher thought to help himself to some headache powder in the absence of the dispenser. *A New Use for Stray Dogs.* Unfortunately for him he found the bottle of atropine sulph. and took several grains. When I was called I found him with widely dilated pupils and delirious. He could not answer questions as to what he had taken and kept picking at his clothes and tossing about. The remains of a white powder were on the floor, and tasted bitter. I at once had him carried to hospital and gave $\frac{1}{4}$ gr. morphia hypodermically, and on looking at the shelves saw the bottle of atropine next to cerii axalas, and as that had been suggested I knew it was atropine from the bitter taste of remains. In a minute I got pilocarpine and gave $\frac{1}{2}$ gr. hypodermically. Just then an assistant came in saying it was certainly atropine. I asked how he knew, and he said that as there were always dogs out beside the kitchen he had caught one and put some of the remains in its eye and got speedy dilatation. I thought this a piece of very smart work. It had not occurred to myself, and it showed that the lessons of the winter course on *materia medica* had been picked up.

With another $\frac{1}{2}$ grain pilocarpine hypo. and washing out the stomach a good recovery followed. Delirium continued for 12 hours and dilatation of pupils for 2 days.

Fatal cases have been recorded after 2 grain doses, and I expect that more than that was taken in this case, but the speedy emptying of stomach and antidote saved his life. I note the case for the smartness of the dispenser in his procuring a certainty as to the drug by using the stray dog.

ALEX. R. YOUNG.

PYENGYANG, KOREA.

DEAR DOCTOR: Four cases of uoma, or cancrum oris, within the past month, and three of them fatal, with the other critical, and no result from the usual methods, makes me appeal to the Association for advice. There is no use asking in Europe or America, for the disease is very rare there—I did not see a case in my European experience—and it is not rare here, and I presume is as frequent in China. The usual methods of excision, application of carbolic acid, peroxide hydrogen, etc., with supportive treatment, does not avail. I have had some cures, but four fatal cases hand-running is discouraging, and we ought to find a remedy. I wanted to use antitoxin, but could not because our finances limit our resources, and if I could not use plenty I would not want to try it. The same with anti-streptococcic serum. There must be a remedy in use for other diseases which will or ought to cure this terrible affection. Some of these four cases have been brought in in time, that is, the disease had not spread much.

I hope that this appeal will not be passed over as so many such requests are, but let us have experience and suggestion. In behalf of the pitiful children I cry, Help!

Sincerely,

J. H. WELLS.

BOONE UNIVERSITY LIBRARY, }
WUCHANG, January 21, 1910. }

DEAR DOCTOR: I have waited for the medical books to arrive before writing about them.

A Word of Thanks. They came last night from the Presbyterian Mission Press. I can assure you we appreciate them greatly, and they are going to be such a valuable addition to our library.

One or two of our medical students have been looking over the books to-day, and they seemed delighted to get hold of something in their own tongue after wrestling with technical terms in a foreign language.

I have told Dr. Merrins about the works and I am sure he is as gratified as I to receive them.

Will you thank the members of the Medical Missionary Association for us for this gift?

We shall try and follow out your suggestion in regard to having the books arranged so that they may be seen, and thus brought to the notice of people interested in medical literature.

Believe me,

Very gratefully yours,

MARY ELIZABETH WOOD.

TÜBINGEN, January 18, 1910.

DEAR DOCTOR: Will you kindly take notice of the communication that the Tungkuu

A Correction. hospital has been built at a cost of \$36,372 *Mexican*, and the land bought for \$4,388 *Mexican*, not *gold*, as the printer likes to say on pg. 172, CHINA MEDICAL JOURNAL 1909.

I am, yours truly,

G. OLPP, M.D.

Personal Record.

MARRIAGES.

AT Shanghai, July 8th, Dr. HAROLD BALME, E. B. M., to Miss H. E. CARR, C. I. M.

AT Yokohama, July 30th, Rev. B. LANCELL, A. C. M., to FRANCES F. CATTELL, M.D. (late of A. P. M., Soochow).

BIRTH.

AT Kiangyin, May 11th, 1910, to Dr. and Mrs. GEO. C. WORTH, S. P. M., a son (James Spencer).

AT Peking, June 2nd, to Dr. and Mrs. F. E. DILLEY, A. P. M., a son (Charles Albert).

AT Sianfu, July 11th, to Dr. and Mrs. CHARTER, E. B. M., a daughter (Dorothy Eileen).

AT Kuling, July 25th, to Dr. and Mrs. C. E. BLAIR, J. M. S., Tingchiu, a son.
AT East Orange, N.J., August 17th, to Dr. and Mrs. F. J. TOOKER, A. P. M., Siangtan, a son.

ARRIVAL.

August 20th, Dr. EMMA BEROW, M.E.M., Singiu, from U. S. A.

DEPARTURES.

May 4th, Dr. ANNA D. GLOSS, M. E. M., Peking, for U. S. A.

May 11th, Dr. CHARLES F. ENSIGN, wife and two children, M. E. M., Taianfu, for U. S. A.

May 25th, Dr. F. W. GODDARD and wife, A. B. M., Zauhsing, for U. S. A.

WANT DEPARTMENT.

WANTED.—Helminthes, blood sucking diptera, venomous snakes.—Dr. G. Olpp, for the "Deutsches Institut für ärztliche Mission," Tübingen, Germany.