Original Communications:—
Research Committee: Final Report. J. L. Maxwell, Chairman. 163
A Note on the Classification of Fevers in Central China.
By Edward H. Hume, M.D. 170
The Treatment of Cholera by Continuous Intravenous Saline
Transfusion .... .... .... By J. A. Thomson, M.B., B.S. 181
Sprue: Its Diagnosis and Treatment.
By J. Howard Montgomery, M.B., Ch.B. 194
Cut Throat in Relation to Speech .... By E. M. Merrins, M.D. 205
Two Cut Throats .... .... .... By Elliott I. Osgood, M.D. 208

In Consultation .... .... .... .... .... .... 211

Reports of Customs Surgeons:—
Quacks in Japan .... .... .... .... .... .... 217

Editorial:—
Human .... .... .... .... .... .... 219
Death of Dr. J. A. Otte .... .... .... .... .... 220
Resolution on Doctor Cawas Lalcaca .... .... .... 220
Book Reviews .... .... .... .... .... .... 221
Nurses' Department .... .... .... .... .... 223
Branch Report .... .... .... .... .... .... 224

Medical Progress:—
The Pathogenesis of Typhoid Fever .... .... .... 225
Correspondence .... .... .... .... .... .... 227
Personal Record .... .... .... .... .... .... 228
**Medical Missionary Association.**

**PROPOSALS FOR MEMBERSHIP.**

Note.—Unless objection is made to the Executive Committee, persons properly proposed will be considered elected after names appear in three issues of the Journal.

<table>
<thead>
<tr>
<th>NAME</th>
<th>QUALIFICATION</th>
<th>MISSION</th>
<th>STATION AND POST OFFICE</th>
<th>PROPOSERS</th>
<th>INSERTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bernard Scoble Browne</td>
<td>M.B., Ch., Edinburgh.</td>
<td>C. M. S.</td>
<td>Taichow</td>
<td>Arthur F. Cole, John Jones</td>
<td>&quot;</td>
</tr>
<tr>
<td>Nathan Worth Brown</td>
<td>M.D., Western Reserve</td>
<td>Am. Baptist Union</td>
<td>Hankow</td>
<td>H. W. Oone, W. H. Jefferys</td>
<td>&quot;</td>
</tr>
<tr>
<td>W. R. Morse</td>
<td>M.D., McGill</td>
<td>A. R. M. U.</td>
<td>Suifu, Sz.</td>
<td>J. S. Grant, Arthur F. Cole</td>
<td>&quot;</td>
</tr>
<tr>
<td>Percy T. Watson</td>
<td>M.D., Johns Hopkins, 1907</td>
<td>Amer. Presby. Mission</td>
<td>Fenchow, Shansi</td>
<td>W. A. Hemingway, Charles W. Young</td>
<td>&quot;</td>
</tr>
<tr>
<td>NAME</td>
<td>QUALIFICATION</td>
<td>MISSION</td>
<td>STATION AND POST OFFICE</td>
<td>PROPOSIERS</td>
<td>INSERTION</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------</td>
<td>-----------</td>
<td>-------------------------</td>
<td>--------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Earl P. Huff</td>
<td>M.D.</td>
<td>(Honorary)</td>
<td>U.S. Navy</td>
<td>Edgerton Hart, L. S. F. Lincoln</td>
<td>Second</td>
</tr>
<tr>
<td>E. W. Wilford</td>
<td>M.D., Toronto, L.R.C.P., Ed.</td>
<td>C. M. M.</td>
<td>Chentu</td>
<td>A. Graham, J. R. Cox</td>
<td>&quot;</td>
</tr>
<tr>
<td>John Howard Lechler</td>
<td>M.B., Ch.B. (Edin.)</td>
<td>C. M. S.</td>
<td>Mienciu</td>
<td>C. W. Somerville, R. Wolfendale</td>
<td>&quot;</td>
</tr>
<tr>
<td>Iva M. Miller</td>
<td>M.D., Univ. Med. School, Chicago</td>
<td>M. E. M.</td>
<td>Tientsin</td>
<td>J. L. Keeler, Sue L. Koons</td>
<td>&quot;</td>
</tr>
<tr>
<td>Tsing Meu Li</td>
<td>M.D., Univ. of Penn.</td>
<td>Special Mission, Univ. Med. School</td>
<td>Canton</td>
<td>Dr. J. C. McCracken, Dr. W. W. Cadbury</td>
<td>&quot;</td>
</tr>
</tbody>
</table>
China Medical Missionary Association.

Officers:

PRESIDENT.

P. B. COUSLAND, M.B., C.M. ..................................

VICE-PRESIDENT.

O. T. LOGAN, M.D. ... ... Changteh, Hunan.

SECRETARY AND TREASURER.

C. J. DAVENPORT, F.R.C.S. ... ... Shanghai.

EDITOR OF JOURNAL.

W. H. JEFFERYS, A.M., M.D. (Dr. LINCOLN acting) Shanghai.

ASSOCIATE EDITOR.

C. J. DAVENPORT, F.R.C.S. ... ... Shanghai.

EXECUTIVE COMMITTEE OF C. M. M. A.

Drs. Cousland, Logan, Davenport, Jefferys, Boone, Stuart and Cole.

DEPARTMENTAL EDITORS OF JOURNAL.

Medicine—Edward H. Hume, M.D.
Pathology and Bacteriology—James L. Maxwell, M.D.
Diseases of Warm Climates—J. Preston Maxwell, M.B., F.R.C.S.
Skin Diseases—Adrian S. Taylor, M.D.
Surgery—Augustine W. Tucker, M.D.
Obstetrics and Gynecology—Kate C. Woodhull, M.D.

Korea Branch—Mary M. Cutler, M.D.

Honorary Vice-Presidents.

J. G. Kerr, M.D., LL.D., 1887-88.
H. W. Boone, M.D., 1889-90.
A. W. Douthwaite, M.D., 1893-94.
B. C. Atterbury, M.D., 1895-96.
R. H. Whitney, M.D., 1897-98.
R. C. Beebe, M.D., 1899-1900.
J. B. Neal, M.D., 1903-04.
D. Christie, F.R.C.P., L.R.C.P. & S., 1905-06.
G. A. Stuart, M.D., 1907-09.

Special Commissioner of Research.

J. L. Maxwell, M.D., Tainan, Formosa.

Committee on Medical Tracts and Posters.

R. T. Booth, M.B., B.Ch., | Chairman.
E. T. Logan, M.D., Changteh.
J. G. Meadows, M.D., Huchow.

The China Medical Journal

PUBLISHED BY

The China Medical Missionary Association.

The membership fee of the Medical Missionary Association is Four Dollars a year. This includes the CHINA MEDICAL JOURNAL. There are six numbers in each year. Payment should be forwarded to the Presbyterian Mission Press, Shanghai.

Articles intended for THE CHINA MEDICAL JOURNAL should be sent to the Editors, who solicit contributions from all Medical Practitioners in China, Korea, Japan, Siam, Philippine Islands, or elsewhere.
The
China Medical Journal.

Vol. XXIV. May, 1910. No. 3.

Original Communications.

[All copy must be in the hands of the Editors one month before date of publication to insure appearance in the following number. The Editors cannot undertake to return manuscripts which are sent to them. A complimentary edition of a dozen reprints of his article will be furnished each contributor. Any number of reprints may be had at reasonable rates if a written order for the same accompany the paper.]

RESEARCH COMMITTEE:

Final Report.

Three years ago at the last general meeting of the Association, after a discussion on the importance of a more general advance in the matter of the scientific investigation of disease in China, it was decided to form a Research Committee and to devote the next three years' work to the subject of intestinal parasites, especially those of the metazoal variety.

Your committee has already published three interim reports, and a fourth is now in the press. In this final report for the general meeting we shall deal only with the results to be gathered from the detailed reports and add a few remarks about the working of the committee. On looking over the papers that have already come in, we are satisfied that the intention of the Association with regard to stirring up general interest in this subject and simultaneous investigation has, to some extent, been met. Reports of more or less value have come from most of the provinces, and our knowledge of the distribution of intestinal parasites has been greatly increased. Further, and perhaps this is the most important result of all, the attention of those who have not actively engaged in the work has been called to the importance of the pathological results of those parasites and the necessity of seriously considering them as a factor in the diseases they treat.

We shall now try to summarize the knowledge we have gained during the last three years in regard to the individual species of worms, and in doing this we shall refer largely to the results we have published in the fourth interim report under the heading of the different provinces.
NEMATODES.

The first worm of this class is our old friend the *Ascaris Lumbricoides*. For long it has been known that this worm was ubiquitous in China. How ubiquitous it is, our reports will show. The commonest figure given for infections is about 75 per cent. for the large majority of the provinces from which we get reports, and the larger the series of cases investigated the nearer the percentage approximates to this figure. It seems probable that three quarters of the whole of the Chinese people are infected by these unpleasant creatures. The proportion in children and young people is indeed much larger, but it tends to fall as age advances. With regard to the pathological effects of this worm we do not propose to speak here. Personally, as we have said before, we are very sceptical of any effects beyond the purely mechanical results of the presence of a foreign body in the intestinal canal and the reflex irritation that such may lead to. Others, with as good or a better right to speak, hold views diametrically opposed to these. The question must still be taken as an undecided one.

The *Oxyuris Vermicularis* we shall dismiss in a few words. This is also a common worm, probably as ubiquitous, though much less common than the ascaris. It is practically impossible at present to obtain satisfactory statistics about this helminth. The eggs but seldom appear in the stools, and it is only when the worms are very numerous, and the consequent itching severe, that the patients come or are brought for treatment. The infection, though unpleasant, is not one that seriously affects the health.

The *Trichocephalus Trichiuris* (t. dispar.) is another worm with a very wide distribution. In our own series of 1,050 cases the infections with this worm amounted to nearly 40 per cent. It would probably be safe to consider that at least a quarter, perhaps more than this, of this number will be found in any careful and extended investigation in China.

In the case of this worm, too, we have no proof of any pathological lesions being caused directly by the parasite. We had, ourselves, the interesting experience the other day when performing a lateral anastomosis of the ileum with the caecum, of seeing a caecum during life that had attached to its wall a large number of these worms. It appeared in no way the worse for its inhabitants, nor did they effect in any way the successful union of the parts.

The *Strongyloides Intestinalis* (anguillula stercoralis) is a worm of which we hear too little. Only three reports have reached us—from
Yungchun, Fukien, Wuhu, Anhwei, and Siam. This probably in no way corresponds with the true distribution.

The larval form is found free in the stool and is very easily mistaken for the larva of the ankylostomum. They may be distinguished by slight differences about the anterior end, but still more easily by remembering that the egg of strongyloides is seldom if ever seen in the stool, whereas the ankylostomum larva is probably never passed as such or can be found in fresh faeces.

We believe we have seen the worm several times and made this mistake; we are on the watch for it now and expect soon to report its presence in Formosa.

The Ankylostomum worm is, however, the helminth which both merits our most careful consideration and in connection with which this investigation has done some of its most important work. The presence of ankylostomum worms in China was well known long before the work of this committee commenced. The extent of the infection was absolutely unknown. Looking carefully over all the Customs medical reports from the beginning till 1903 we have failed to find a single reference to this parasite and its effects. As a result of the work of this committee we now know that the worm is widely distributed over a great part of China.

Out of twelve provinces from which we have reports it is found in nine and in most of these quite commonly. It is reported as absent from Kwangsi, which we absolutely decline to believe, and from Shensi and Shihli the reports from both of which provinces require very careful confirmation. It is reported also as absent from Manchuria, but common in Korea, Formosa, Hongkong, and Siam. It is probably rare or absent in North China, common, often terribly common, over Central and Southern China, but again we say that the first part of this remark requires careful confirmation, and we earnestly beg our brethren in the north to settle this question for us. A very few years ago, except for a small number of better informed brethren, we looked on the question of ankylostomum infection as an interesting academic problem. Most of us now know, and this thanks to the work of the Research Committee, that the disease is a real one, a common one, and that it carries off every year thousands of Chinese to an early grave. Those of us in Central and Southern China who fail to face this question are culpably careless of the people God has put into our hands to heal. The careful attention to these cases means not only the saving of the few bad cases which we first meet with but the drawing into the hospital of numbers, whom our former failure to cure such patients,
The China Medical Journal.

has made chary of coming to our hospitals at all. An important point now arises as to the best method of treatment. Glancing at the report under the heading of "Provinces" we find that by far the commonest drug used is thymol. Eucalyptus is employed by one or two and felix mas by a few others; some also use beta-naphthol. Undoubtedly all these drugs are effective. But from the personal experience of others, and from a short personal experience ourselves, we are very strongly in favour of the beta-naphthol treatment. Up to a short time ago we used only thymol; we have now abandoned this entirely in favour of beta-naphthol. The latter drug is comparatively cheap, does not go bad (as does felix mas) and is practically non-toxic. We recommend the following routine method of administration: A purgative to empty the bowels the night before, followed by four doses of fifteen grains each of beta-naphthol given at half-hour intervals on an empty stomach the next morning and followed at once by another purge. The treatment is to be repeated again in another week and a third course given a week later if the stools still contain ankylostomum eggs. Two points of interest yet remain to be discussed. Why, in a place where the infection is common, is the anaemia caused by the parasites and which constitutes the disease we know as ankylostomiasis comparatively rare; certainly not more, probably not nearly so common as 25 per cent. of the cases? Apparently it does not depend entirely on the number of the worms present. Possibly it does depend on repeated infections. The matter deserves discussion.

The other point is of great interest, though perhaps of less importance. Is the worm met with most commonly the necator americanus or the ankylostomum duodenale? So far the latter easily holds the field. See provincial reports. We suspect that to some extent this is a matter of careless examination. We were very much amused by two reports from one city, in which the one report mentioned only the necator the other only the ankylostomum. We do not venture to suggest a social prejudice in favour of the worm of his native land in each observer’s breast, but we do suggest that each has mentioned only the worm with which he himself has become most familiar in his studies of tropical diseases at home. The worms are easily distinguished by the absence of teeth from the necator’s armature, the sharp bend of his neck, the umbrella-shaped bursa with one side broken in as opposed to the regular umbrella shape of the ankylostomum bursa and the hooks at the end of the spicules in the American worm.

It is interesting to note that there is a concensus of opinion against the presence of any such disease as “ground itch” in China.
CESTODES.

Of the tape-worms we shall say but little. The reports of these helminths has been the least satisfactory part of our work, and the answers to our enquiries have, for the most part, been so vague as to be of almost no practical value. Few recognise the worms they have met with, and it seems likely that often only imported cases are referred to in the replies. It seems that these worms are rare if not absent over a considerable area of Central and South China; while more or less common in the north. On the other hand one has the extraordinary fact, if correct, that Yunnan abounds with tape-worms, while we have negative reports from several places in the north. Korea is undoubtedly a great centre for tape-worms.

The whole subject needs a thorough investigation. We are anxious, too, to obtain specimens of all the tape-worms found in China for comparison with those met with at home. May we ask for specimens, including head and some mature segments, to be sent to us addressed Tainan, Formosa? We shall gladly meet any expenses involved in postage, etc. May we ask, too, that all members make a note of cases met with, both as to the variety of the parasite and as to the question of whether the infection is locally acquired or only imported from some other province or country?

One more point of great interest arises. We have always been under the impression that hydatid disease was quite absent from China, yet we have reports of taenia echinococcus from two places—Kiating, Szechuan, and Tsingtau, Shantung. Observers please send further information on this point.

TREMATODES.

When we come to the trematodes we reach what is perhaps the most interesting point of our report.

Fasciolopsis Buskii has, as a direct result of the formation of this Research Committee, been shown to occur in several places: Ningpo, from which place it was first described; Shaoshing, where Goddard has found it with some frequency, to whom also we owe what little we know of its symptoms; Chaochowfu, Kwangtung, as the result of Whyte's investigations, and just as we go to press we have received the report of a case from Vogt, of Yi-yang, Hunan. One case is also reported from Hongkong. It therefore seems not improbable that this worm also has a wide distribution. Space will not permit us here to enter into the question of the number of species at present included under this name. There probably are two, possibly three, or even four
varieties. Further investigation alone can elucidate the question. In
the meantime we suggest that the term *Fasciolopis Rathouisi* be dropped
altogether and, if different varieties be shown to exist, that they be
renamed. It is, we believe, quite clear that the specimen originally
described under the name of *f. rathouisi* was only a contracted form
of *f. buskii*, and it will only add to the confusion to apply this name
to any newly discovered species allied to *f. buskii*.

*Clonorchis Sinensis* is another species of worm that has come to
stay, and will probably be found to be of a wider distribution than is at
present recognized. It is endemic in Korea, the sea border of Kwang-
tung, in Hongkong and Siam. It is present in Shanghai, and two cases
are reported from Hankow.* It would be well, however, to keep an open
mind about these two last reports until it is conclusively proved that
the cases found in these places are not mere importations from outside.

Again we must decline to enter into the very interesting discussion
of whether there are two varieties of this worm, one causing pathological
lesions and one comparatively innocuous. Baelz first offered this opinion,
see Imperial Customs Medical Reports, 1884, Vol 1, but completely
retracted this opinion later. Id. 1884, Vol 2. Loos, we understand,
believes that there are two varieties, but he has so far failed to demon­
strate any difference between the two. The question is still sub-judice.

The *Schistosomum Japonicum* is the last worm to which we shall
refer. This parasite has a growing distribution, but so far has been
found to be confined to the valleys of the Yangtse and its tributaries.
Here in places it assumes the form of a veritable scourge, which at
present we have no means of combating. The worm is also reported
from Hongkong.

A few words must now be added with regard to the working of
the Research Committee. As a committee it has been an absolute
failure and was from the first almost bound to be this. The members
of the committee have never been able to meet each other; a number
of them were necessarily appointed without an opportunity of signify­
ing their acceptance of the post, and it was therefore never possible to
organise a plan of campaign. Only one series of reports, already
tabulated and prepared for publication, was received by the chairman.
Almost all other communications he has had to arrange for publication
and comment on himself. The chairman is as busy a man as most of the
other medical missionaries in China, and at times has found this rather
a heavy strain. He has not grudged a moment he has spent on the
work which has proved most fascinating, but the position is not a satis-

* Cases reported from Hankow stated to be both from South Kiangsi.—*R. T. Booth.*
factory one. The real future success of the committee depends almost entirely on the proper organization of our branches. Each branch should have a member on the Research Committee, whose business would be to arrange for reports on the subject or subjects under investigation, to collaborate these and then to forward them to the chairman merely for simultaneous publication with other reports. We would earnestly recommend the general meeting to dissolve the existing committee and to press some scheme of this kind very strongly on the local branches.

One point we should venture to humbly remark upon. It is the aim, we trust, of all of us to make the China Medical Journal all it should be, viz., a journal recognised throughout the scientific world as the authority on scientific medicine in China. It is gradually gaining that recognition at home, but to attain that end, and to maintain it, requires a self-denying ordinance among our members. We shall not succeed if some of our very best papers are published first in the home papers instead of our own journal. Raise the standard of scientific value of the papers in the Journal and the home papers devoted to this branch of medicine will have to review these papers in their own columns and so the wider constituency that these writers wish to reach will be attained.

The only other point worthy of remark here is the future line of investigation to be taken up by your Research Committee. The subject taken up for the past three years has been but just begun, and it would be a pity indeed to drop this research. At the same time there are many other questions simply crying out for investigation. Is there any reason why two or more subjects should not be taken up? It would need of course a chairman or whatever he ought to be called for each separate subject to collaborate and publish reports, but it would leave our members free, while not absolutely neglecting other branches to spend their spare time and energies on the subject most to their taste. Above all things it is important that we organize our Chinese assistants to work with us along the lines of research that the committee adopt.

Ladies and Gentlemen, in laying down my office as chairman I wish to acknowledge what a debt of gratitude I owe you for the honour of the appointment which I have unworthily filled for the past three years. The work has been a great source of enjoyment to myself, and I hope of some profit to others. I trust that in the future I may still be able, by my own investigations, to serve your committee along the line of research that has now been auspiciously commenced.

James L. Maxwell, Chairman.

January, 1910.
A NOTE ON THE CLASSIFICATION OF FEVERS IN CENTRAL CHINA.

By Edward H. Hume, M.D., Changsha.

In 1873 Jürgensen¹ said with almost a modern bacteriologist's discernment: "The whole theory of infective diseases is untenable if the existence of milder forms cannot be shown; transition from the mildest to the severest must be demonstrated."

In spite of this keen observation there continued to grow up during the thirty years following, as had occurred during the twenty preceding, an extensive but comparatively valueless literature on mild and atypical forms of fever, one of whose chief features was the countless variety of names given to these maladies.

The object of this paper is to classify into a very few groups some of the short fevers in China that present special difficulties of diagnosis due to atypical manifestations and to lay stress on those more accurate methods of diagnosis which must characterize future study of them. The differential diagnosis of malarial fevers will not be considered at all.

The bulk of evidence goes to show that infections with organisms of the typhoid-colon group form a large percentage of unnamed short fevers. Row,² of Bombay, says: "Pure b. coli infection seems to be the most common cause of atypical and irregular fevers dealt with here. However, it is not unusual to meet with infection by b. enteritidis (gaertneri), or with mixed infection with two or more organisms of this class." Coleman³ reports that in New York some strains of b. coli are capable of causing a disease clinically identical with typhoid fever, and that the symptom-complex of typhoid fever may be caused by several members of the group typhaceae. Bates⁴ found 32 per cent. of atypical typhoid-like fevers in Panama. Among fifteen cases of typhoid seen in Changsha, three were atypical to a degree that long delayed a correct diagnosis. It is to the diagnosis of these atypical cases that special reference is to be made here. Clinically the chief difficulties in their diagnosis are due to unusual modes of onset or to irregularities in the character of the fever. The blood picture in these fevers, their seasonal incidence, as well as other features, also frequently puzzle the most experienced student.

---

¹ Jürgensen: Quoted in Murchison's "Continued Fevers."
TYPES OF ONSET.

I wish to re-emphasize the fact that while many cases of clinical typhoid fever commence with malaise, chilly feelings and a step-like temperature, many other cases that we call atypical would be readily recognized as clinically typhoid were we accustomed to the less usual modes of onset.

(a) Sudden Onset.—At the Mount Sinai Hospital in New York, Manges reports that 10 per cent. of cases of typhoid fever have a sudden onset (N. B. by “cases with sudden onset” is meant those that have a really abrupt beginning and not those unfortunate cases with apparently sudden onset in which the infection has been active for days and has only caused the patient to seek medical advice because of the appearance of some serious complication). Of still greater significance to us is the conclusion of Leonard Rogers that in India the classical step-like rise is apt to be absent. Of six cases admitted by him during the first two days of fever, none showed a gradual rise of temperature, but in each it had already risen to from 103° to 105° F. Goodhue, writing from the Hawaiian Islands, describes a fever whose causative organism is at least as close as a paratyphoid to the b. typhosus group, but apparently fails to associate a sudden rise of temperature with typhoid fever and therefore groups all cases in which this occurs as “Hawaiian fever.”

The following case has recently been under my care:—

A. H., age 23, British, treated September 15, 1909, for venereal sore. No mercurials used. Secondary syphilide first reported to me on October 25th, when patient felt fairly well. A course of “soamin” injections was begun at once. Three injections were given—on October 25th, 27th and 29th. The patient had a little diarrhea during the week, but felt comfortable at the time of the third injection and had no fever. That same evening, at dinner time, he was taken violently ill with vomiting and diarrhea. A dose of chlorodyne, given by a friend, checked the diarrhea, but the vomiting continued, and when seen at 2 p.m. on October 30th he was found to be very ill. Temperature 104.2° F; pulse 120; frequent bilious vomiting. Twenty-four hours later the temperature was 104.4°, and as nourishment could not be retained, the stomach was washed. Rectal feeding was resorted to and had to be continued for seven days, during which period the stomach retained absolutely no food. Malarial parasites were not found. Leucocytes not markedly abnormal.

The diagnosis remained a great puzzle till the 14th day, when a few rose-spots appeared. The temperature chart illustrates the suddenness of the onset.

Another and very instructive case8 illustrating the possibility of abrupt onset is that of a physician in New York, who accidentally swallowed a small amount of broth culture of b. typhosus; seven days later was suddenly taken ill with high fever, marked prostration and diarrhea, and within two days showed a complete picture of typhoid.

Three explanations are offered to account for such sudden invasions. 1. That typhoid bacilli have been developing silently within the organism. Widal, who supports this view, adduces in its favor the observation that the agglutination reaction occurs much earlier in such cases than usual. 2. The intense virulence of certain strains of organisms. At the Liverpool Royal Infirmary I had the opportunity, in 1902, of making cultures from a case of typhoid in which death occurred after an almost explosively violent type of infection. The brain of the deceased patient was given to a medical student for special dissection. Within a week he himself was taken ill, to succumb after a similarly abrupt infection. 3. Lowered resistance, due to preexisting

---

disease such as malaria, syphilis or tuberculosis. In the case of A. H., reported above, the patient's system surely yielded to the attack of the invader much more abruptly because of the syphilitic poison in his system.

(b) Onset with Headache.—B. H., age 40, British, resident in Bombay, was seized with headache on November 14, 1903. When seen by me on November 15th his sole complaint was headache. The pain was chiefly parietal, though at times also occipital. Temperature, 101.5° F. Blood, negative. Kernig's sign, absent. Phenacetin and applications of cold were of but little service. The temperature was never above 101.5°, and disappeared entirely after five days, being followed by a facial neuralgia, partly due to caries of the teeth. No other signs having developed, the patient was twice accompanied to the dentist's, and on the ninth day after temperature became normal was allowed to go fifty miles by rail to a mountain resort near by. Within a week after reaching there, he died of intestinal perforation, after a few days of typical typhoid symptoms. It was a particularly puzzling case, because of absence of roseola and enlarged spleen and the early return to normal temperature. It seems most probable that the initial attack was a mild abortive typhoid, followed after a few days of normal tempera-

---

The Classification of Fevers in Central China. 173
ture by a more typical manifestation during relapse. The headache of typhoid is usually frontal. A young man in New York was seized with violent frontal headache and was referred to a rhinologic specialist, who discovered swollen turbinates, and operated to secure drainage. No relief occurring, and the fever still continuing, the frontal sinuses were opened and drained. On the following morning, a typical roseola was discovered.

(c) Onset with Meningeal Symptoms.—Teng, age 23, Chinese, was taken ill with fever while a prisoner in a Changsha jail. He was unconscious for several days and was discharged from jail because the official thought he was dying. When admitted to the C. I. M. hospital, Dr. Keller found him unconscious. He gradually came out of this state and was delirious for two weeks. The development of a parotitis eight days after admission, together with other typical clinical signs, clinched the diagnosis of typhoid. An American boy, age 14, admitted to the Mount Sinai Hospital, was found to be in coma, with high fever and slow pulse. The history was that he had fallen down a flight of steps some days before, had struck his head, and had remained unconscious ever since. Lumbar puncture gave a sterile fluid under pressure. The case was regarded as surgical until a typical roseola was discovered, and the patient thereafter ran a usual typhoid course. Patient A. H., already referred to, may also be classed in this group. Commencing with gastric irritability and high fever, he soon became delirious and lay practically unconscious for days. Corneal reflexes were abolished, and except for respiration and the heart’s action, might often have been taken for one dead. For 21 days he lost all control of urine and feces. As has already been stated, the case was extremely puzzling until the roseola appeared.

Cases commencing with all the symptoms and signs of pneumonia, cases of severe albuminuria and with other clinical signs of acute nephritis, cases ushered in with abdominal pain simulating acute appendicitis, and cases with the respiratory and general symptoms of influenza,—all tend to bewilder. They make one almost forget to search for a roseola, to examine the serum-reaction, and to seek in blood-cultures for the infecting organism. Let the internist, rather, be prepared to class with the typhoid-colon infections many of the cases that commence abruptly, and whose temperature runs a course in many ways unlike what he had learned to associate with clinical typhoid fever.

(c) Manges: Loc. cit.
(10) Manges: Loc. cit.
The Classification of Fevers in Central China.

SHORT-DURATION FEVERS.

With such names to choose from as "Simple Continued Fever," "Febriuca," "River Fever," "Bombay Fever," "Calcutta Fever," "Three-Day Fever," "Seven-Day Fever," and passing these by the more definitely named dengue and influenza—the former of these in some camps being identified with Three-Day Fever, in others with Seven-Day Fever, while others claim that it is absolutely distinct from both—one is bewildered, and is tempted to take the position of the artist who has painted Dr. Osier's face wreathed in clouds of disease-destroying smoke arising from the hospital where he was senior physician. Bacilli, spirilla, cocci, both staphylo and strepto, are running away before him in dismay. All, save those who have fled early and are therefore able to keep grouped together by families, are seen as an undifferentiated mass, whose only hope lies in flight; features are unrecognizable—specie distinctions entirely gone—all is diagnosis-less confusion!

The more we study these fevers the more we agree with Krauss, who said in writing of the fevers of the Southern States: "Some continued fevers are malaria, some typhoid, a few something else. I am opposed to the idea of any 'x' fever." We may group them broadly according to the general type of infectious agent present, thus avoiding, on the one hand, the necessity for a separate bacteriological name for each fever caused by members of the typhoid-colon group, where the clinical entity is uniform; and on the other hand, insisting on the need for differentiation between diseases in which bacteremia occurs and those in which it is absent.

The following case will serve as an illustration. K. G., an American child of four years, fell ill with malaise at Kuling, on July 21st, 1908. There was a gradual rise of temperature to 104° F. by the third day. Some diarrhea, constant headache, a little abdominal
distension. Tongue dry, coated white with red edges. Urine acid and swarming with motile organisms. Spleen palpable. No roseola, no delirium, no joint symptoms, no erythema, no respiratory symptoms. A seven-day fever, typical of typhoid in onset and general characteristics, but very mild and very short. The only suspicious element in the history was that she had been in the bathing-pool about a week previously, and being unaccustomed to the water, had undoubtedly swallowed a good deal of it. No indiscretion in diet could be traced. The chart shows the exact course of the fever.

We have all, without a doubt, seen this type of case over and over again, and wondered what to call it. Much light is shed by comparing this case with similar ones reported from other localities. For instance, Burch\(^{12}\) reports a series of cases seen in New York State during a period of ten years, in which the fever lasted from seven to ten days and in which the blood gave very positive agglutination reactions with organisms isolated from the patients' bodies. These bacilli were shown, by all cultural tests, to belong to the colon group. Widal and Lemiere\(^{13}\) report a similar infection with \(b.\) coli; the fever lasting but nine days. Conradi\(^{14}\) has recovered \(b.\) typhosus from cases of fever lasting not over eight days. Coleman and Hastings\(^{15}\) relate the case of a young man in New York, who had been swimming daily in the East River, and whose illness began with weakness, headache, pain in the stomach and legs, bad taste in the mouth, and anorexia. Rose-spots were found on the chest and abdomen. Blood-cultures gave pure cultures of \(b.\) coli. The temperature fell to normal after twelve days, but a relapse occurred after twelve days without fever. Blood cultures made by Bates\(^{16}\) in Panama gave results positive for bacilli of the typhoid-colon group in no small percentage of cases where the fever lasted not over eight or ten days. And finally when one reads\(^{17}\) that of 229 cases of typhoid treated in the New York Hospital, 10 per cent. were of short duration; some lasting but five or six days, others as much as nine or ten, cases in which the diagnosis was not questionable, for it rested on either positive serum-reactions or on blood cultures positive for the typhoid-colon group, he is compelled to grant that mildness of symptoms and brief duration, as well an atypical onset rather than militating against a diagnosis of fever due to members of the typhoid-colon group, form a symptom-complex which is to be definitely expected in from ten to twenty per cent. of fevers so caused.

\(^{14}\) Coleman and Hastings: Loc. cit.
\(^{15}\) Coleman: Loc. cit.
\(^{16}\) Bates: Loc. cit.
\(^{17}\) Coleman: Loc. cit.
The Classification of Fevers in Central China.

A. Typhoid Colon Group. In this group we may include:

1. Cases that are clinically typhoid in symptomatology, however abrupt their onset and mild or brief the temperature course, and in which the serum reaction is positive with *b. typhosus*, or cultures yield this organism.

2. Cases clinically similar to the above, but giving serum-reaction with or yielding cultures of *b. paratyphosus*. In this sub-group should be included Goodhue's cases of "Hawaiian Fever."

3. Cases clinically typhoid, due to infection with *b. enteritidis*, such as those reported from Bombay by Row.

4. Cases of fever due to infection with *b. coli*, proved by cultures from urine or blood, together with agglutination reaction, even in high dilutions.

5. Ichang fever, so well described in the *China Medical Journal* by Stooke. That the parallel diagonals on which he lays emphasis

as characteristic of Ichang fever can be traced in the fever curve of many a typhoid case, and that this has been long recognized as a fact, can be seen by referring to the temperature chart of a typical typhoid case at page 516 of Murchison's classical "Continued Fevers," or by a study of chart 15 at page 118 of Rogers's "Fevers in the Tropics."

The absence of rash and of abdominal symptoms is also a feature not uncommon in mild infections, and as Dr. Stooke himself acknowledged, the cases of Ichang fever reported by him certainly deserve, for the most part, the epithet "simple." The mononuclear count in his cases is certainly higher than is usual for infections with the \textit{typhaceae}; however the reported cases are but few, and it is possible that in a larger series this percentage would be reduced. As Rogers well points out, a high count of large mononuclears early in a continued fever would point to kala-azar rather than to typhoid. That the cases from Ichang are not kala-azar from any other point of view is obvious from the clinical description.

6. The "Seven-Day Fever" of Indian ports, so carefully described by Leonard Rogers,\textsuperscript{19} and of which so characteristic an epidemic occurred in Bombay in 1907-8.\textsuperscript{20} In addition to many points of resemblance to mild typhoid fever caused by \textit{b. typhosus}, blood-cultures yielded a bacillus very closely allied to the typhoid group as culturally tested, and the patients' serum agglutinated the isolated organism very strongly.

One agrees with Murchison in wishing that the name "typhoid," meaning "like typhus," had not been given to the clinical entity, now known by this name, so that some such name might be available for a large group of fevers akin to what we call true typhoid. It would be assuming too much to assert that all atypical fevers of the general character described in Group A. are caused by members of the typhoid-colon group of bacilli. They certainly cause a majority of such cases. The name "typhoid" may well be applied to such fevers as resemble, in general, the clinical entity to which we commonly give this name. Other fevers, atypical in clinical manifestation, but also caused by bacilli of this group, might be called "typhaceous," or by some other name that will suggest the kinship so readily proved by blood culture.

B. Dengue Group.

There can be no hesitation in placing dengue in a group quite distinct from the typhoid-colon group. The work of Ashburn and

---
\textsuperscript{20} Clayton; \textit{Jour. Trop. Med. and Hygiene}, 1908. XI, 164.
Craig\(^{21}\) has proved beyond a peradventure that the infective agent is ultramicroscopic, but that it is in the blood. It is spread like yellow fever by mosquitoes; one species, *culex fatigans*, having been proved capable of conveying it. This etiological difference alone is sufficient to prevent seven-day fever from being confused with it, provided blood-culture work hitherto done in the two diseases is not proven to have been faulty. Should seven-day fever prove to be identical in its causation with dengue, it would merely mean its withdrawal from Group A. above and its inclusion in Group B. Still another fever, unclassified hitherto, the so-called "Three-Day Fever," may now be grouped with dengue. A recent epidemic in Christmas Island\(^{22}\) being regarded as furnishing good evidence of the identity of the two diseases; their manifestations varying somewhat at different times and in different localities.

C. *Influenza Group.*

That the causative organism of this disease is distinct from those of Groups A and B above, and that this organism can usually be isolated from the secretions of all typical cases, is well enough known. Further, the fact that lungs and throat are involved in tropical influenza in over 90 per cent of cases,\(^{23}\) together with the seasonal incidence, and the differences in the fever charts as compared with those in the first two groups, give a sufficient basis for differential diagnosis.

In one or the other of these three groups, then, it is believed that a great majority of the short, more or less puzzling fevers of Central China, may be included. Of course malarial fevers will form a large fourth group, but no attempt has been made in this paper to even consider them, because true malarial fever should not, in the absence of quinine, be a diagnostic puzzle in the vast majority of cases. The same may be said of some of the other short fevers, such as plague, relapsing fever, acute febrile icterus, heat stroke and the exanthemata, each of which has characteristic features, either clinically or microscopically recognisable. True exanthematous typhus will form, in general, but a small percentage of the fevers which we are called upon to differentiate.

Blood changes are not typical in most of these fevers, and therefore are of less help than might have been expected. Leucopenia is the rule, rather than leucocytosis.

\(^{22}\) Allan: *Jour. Trop. Med. and Hyg.*, 1909. XII., 301
\(^{23}\) Rogers: Loc. cit.
METHODS OF ACCURATE DIAGNOSIS.

If it be urged that from the therapeutic view-point it is not essential to make clear-cut diagnoses between and within these three groups, it will suffice to respond by calling attention to the differences in the manner of transmission of their infective elements. In group A the infectious bacterium is, in the vast majority of cases, introduced with the food, though the inoculation of typhoid and kindred germs by the bites of lice and other insects has been shown to be possible. In Group B the contagium is doubtless introduced into the system by the bite of a mosquito. In Group C we have infection by inhalation in a large proportion of the cases. From the standpoint of prophylaxis alone, therefore, it is essential that we take up with all earnestness the matter of detailed diagnosis. We can certainly no longer be satisfied with a name such as "diagonal remittent," however descriptive this title may once have seemed.

Our future diagnoses, to be considered of value, are going to rest upon the care given to a study of the blood; the count of its corpuscles, white and red; its intracorpuscular protozoa, and its bacterial content. How the ultramicroscopic contagia of dengue, yellow fever, etc, are to be recognized, is a problem for the future. The fact that such study of the blood in fever cases requires time, is in itself one of the strongest possible arguments in favor of the position taken by this Association in passing resolutions to the effect that all pressure should be brought to bear to secure a staff of at least two foreign physicians for every large hospital. It will be possible in this way, using modern methods for the facilitation of laboratory work, to make practically all the tests, by means of which certainty in diagnosis may be attained. In the larger centres, and in every place where medical instruction is given, nothing should hereafter be allowed to take the place of careful blood-examination. From the Philippines, from Egypt, from Panama, and from India, we are getting records of increasing definiteness of diagnosis. In the very heart of Africa, modern methods are revealing secrets of etiology that no previous age has been able to unfathom. Let not the record for China—and its making is in our hands—fall behind.
THE TREATMENT OF CHOLERA BY CONTINUOUS INTRAVENOUS SALINE TRANSFUSION.


LADIES AND GENTLEMEN:

When your secretary honoured me with a request to prepare a paper to be read before this society, he kindly left to me the choice of a subject, but when he did so I did not realise how difficult the choosing of a subject would prove to be. Happily, however, a fortunate experience in the treatment of cholera, during the course of last summer, by Dr. Cox's method of continuous intravenous saline transfusion suggested to me a good way out of my difficulty, and in bringing this method of treatment to your notice I think that I am introducing a subject which will be more or less new and therefore interesting to many present, and at the same time a method of treatment well worth the earnest consideration of all who are likely to be called upon to attend to cases of that disease.

In our medical literature many methods of treating cholera have, from time to time, been advocated. I need not enumerate all of these methods, but a few examples will serve to illustrate how confusing and apparently illogical is the advice which we may expect to derive from this source.

1. Purgatives, gastric and intestinal lavage are distinctly opposed to the administration of aromatics and intestinal astringents.
2. The sedative and rest treatment with morphia is equally opposed to the stimulating treatment with strychnine, adrenaline, atropine, alcohol and digitalis, all of which have been advised.
3. Those who advocate cold bandaging and iced sips are very much at variance with others who pin their faith to hot baths, sinapisms and massage.

Doubtless all of these have been found useful from a symptomatic point of view, but one cannot help feeling that the obvious inference to be gathered from such a confusion of methods is, that in the real treatment of the disease, the profession is still 'feeling its way.' Literature gives a beginner many methods to chose from, but the profession has not yet committed itself in favour of any particular method. There is one thing, however, that is almost universally admitted, and that is the necessity for transfusion; all recent writers are at one on the need for transfusion in some form or other, but here again we get a good deal of different advice as to how this need should be met; some advise transfusions to be given subcutaneously, others intravenously and others again intraperitoneally; some favour
normal solutions, whilst others favour hypertonic solutions; some recommend repeated small quantities at a time until the patient is out of collapse, and then there is the method which I have chosen for the subject of this paper, in which a very large quantity is given continuously for several hours and for a more important reason than merely treating the symptoms of collapse.

I do not intend to criticise these other methods further than to say that during the past twelve summers in Hankow I have myself put most of them to a practical test and that when I look back and compare their results with the results which I obtained from the continuous intravenous method I feel convinced that we have now had put into our hands a method of treatment infinitely superior to any of its predecessors, and that with it I can now approach a case of cholera with a degree of confidence I never experienced before. Formerly I had always an unpleasant suspicion that I could do little more than 'tamper' with the disease, and when my results worked out with a mortality slightly less than the average of the epidemic, I naturally could not accept for myself much credit for my recoveries. But with Dr. Cox's method and apparatus that suspicion of incapability has largely gone and has been replaced by a much more pleasant knowledge of confidence, a knowledge of being able to put up a frequently successful and strong defence against a strong foe.

Before proceeding to describe Dr. Cox's method and apparatus I should like to preface my remarks by a few observations, as they have appeared to me, of the mode of action of the disease and of the reaction of the patient towards it and how these two factors should influence the indications for treatment. Perhaps I ought to apologise for doing so, but I think that much of the illogical confusion of methods previously referred to is the outcome of a certain lack of discrimination between these two factors, viz., the action of the disease and the reaction of the organism towards it.

Every case of cholera suggests two lethal influences at work: (1) drainage of fluid from the tissues and (2) toxæmia, but clinically we can recognise cases in which either one of these factors is more in evidence than the other, so for convenience I will speak of these as (1) the drainage and (2) the toxæmic types of the disease.

In the former, that is the drainage type, the lethal effect of the disease would, in a sense, appear to be chiefly a mechanical one; there had been much vomiting and purging resulting in an enormous and rapid drain of fluid from the body; the shrunken and shrivelled up appearance of the patient at once suggests this, and one can readily
conceive that many of the symptoms of his collapse may be largely due to an impaired circulation of thickened and deficiently aerated blood through the smaller and more tortuous channels of the vascular system, particularly through the capillaries of the lungs, the liver, kidneys and the brain. In this type of cholera one might say that the organism had made a tremendous effort to cast off the offending agent, that the patient is killing himself in his effort to save himself; this may sound paradoxical and exaggerated, but from the point of view of treatment it is, I think, a useful view to take of the case as I will try to show presently.

In the latter, that is the toxæmic type, the patient is also collapsed, but he has not vomited or purged nearly so much as the other did; shrinkage and drying up of the tissues are not so apparent and the features of the face are better retained, the tout ensemble is better recognised than described and must be familiar to you all, and the impression that it conveys is one of profound toxæmia rather than that of extreme loss of fluid, although that, too, must play a considerable part in the development of the case. In this type of cholera the patient has not made the same violent effort to cast off the offending agent which, on the contrary, seems to have paralysed his efforts to eliminate, and the accumulating toxins are fast doing their deadly work.

During epidemics a class of case is sometimes met with in which these two factors—the action of the disease and the reaction of the organism—would appear to be favourably balanced; there is little vomiting or may be none at all, but there is a profuse choleraic diarrhoea lasting about a week, and although the patient looks and feels very ill, none of the serious symptoms of collapse appear. In such a case there is no excessive haste to eliminate and at the same time no excessive accumulation of toxins, and the patient escapes the double danger.

When called to a case of cholera the physician should immediately proceed to get everything in readiness, that is likely to be required, and whilst doing so he will take the opportunity to observe how the case is progressing, and by the time his preparations are completed he will have formed an opinion also whether the immediate danger is to be feared from excessive loss of fluid or from toxæmia. The simile may appear irrelevant, but one might liken a case of cholera to a short distance horse race; the goal is not far distant, but the pace is terrific; the disease being either a reckless and hard riding jockey, or a jockey who makes a wrong use of his "aids," and the persons affected representing different types of horses from the highly excitable "run until he drops" style of animal down to the stubborn beast of peculiar humours.
In the drainage type of the disease the organism has made a tremendous effort to cast off the disease; like a willing horse it has tried to reach the goal too quickly, and in its own haste and energy it is running itself to a standstill whilst the reckless jockey continues to ply whip and spur. A skilful jockey would of course rein up a little to give his mount a breather; he would not continue to whip and spur on a willing and impetuous but exhausted horse; he restrains the animal for a few seconds and so gives it a chance 'to come again,' and a doctor in managing a case of acute purging and draining cholera should try to imitate the skilful jockey. It is in such a case that a word of warning should be given to those who advocate calomel and other purges, as routine treatment for the patient has already done away with the necessity for these as well as for intestinal lavage; in fact he appears to be doing it too vigorously and to be menacing himself with the danger of excessive drainage. The indications are plainly, to endeavour to check for a moment the violence of his efforts and to restore his spent energy; the former is best attended to by a hypodermic of morphia and the latter by transfusion, and these as quickly as possible; massage and hot applications are useful to relieve cramps and to promote the circulation.

In a short time the signs of collapse wear off; warmth returns to the body; the pulse gradually becomes more and more perceptible and finally full, rapid and bounding; the tissues and features visibly fill up and the patient, who only a few minutes ago was a shrivelled almost inanimate being, wakes up, talks and looks about him like a man restored; he has had his rest and 'breather' and is now in a much fitter condition for his supreme effort to finally unseat his tormentor. A case like this will very seldom require a second transfusion; there would appear to be very little cholera toxin left to cause further trouble, and the after-effects may not amount to any more than a little bilious vomiting and bilious diarrhoea for a day or two; all the body functions are quickly reinstated and there is nothing to cause one to think that the tissues and organs had suffered severely from the action of a toxin.

In the toxæmic type, to continue with our simile, we have to deal with a horse which has 'given in' before trying his best, and a jockey who has made a wrong use of his 'aids,' or in other words the patient does not make a strong enough effort to cast off the disease, toxins are retained in large quantities and paralyze rather than stimulate the patient's powers of elimination. Although we know that the body has been drained to a certain degree into the bowel, the drain-
age, judging from the appearance of the patient whose tissues are not extremely shrunken and dried, is obviously not the serious factor in the case; the immediate peril now rises from retention of toxins, and the indications are now to hasten elimination and to as far as possible neutralise and counteract the effects of toxins concentrated in the blood stream. Morphia is now counter-indicated, and I give instead a preliminary hypodermic of adrenalin, atropine, and strychnine; calomel may be given by the mouth and the bowel irrigated with saline, with or without an antiseptic, such as chinosol, and whilst doing this the transfusion apparatus is being made ready, and as soon as possible transfusion is commenced.

Symptoms of collapse quickly pass off, but recovery from collapse in cases of this type is not the end of the patient's crisis; elimination goes on from both bowels and kidneys, but there may be a recurrence of a true choleraic collapse within a few hours or during the following day, and transfusion may have to be done all over again; in any case the patient has still to weather the storm of his reaction, and in this type of cholera the reaction period is one of great suffering and danger, and its severity would appear to be commensurate with the extent of toxic injury to the tissues; the more toxic the case was at the onset, the more severe will be the symptoms of the reaction period.

In the drainage type I noted that the reaction phase was not a source of much trouble to the patient or anxiety to the doctor, provided of course that transfusion had been done early enough, but in the toxæmic type the reaction constitutes a crisis almost as formidable as the original disease. There is fever, not as a rule severe in cases treated by Cox's method, but during the summer of 1908, when I did not use this method, nearly all my fatal cases died of hyperpyrexia within a few hours of the onset of reaction; there is persistent and severe bilious vomiting and bilious diarrhœa, and from this cause I found it necessary to re-transfuse several of my cases on the fourth or fifth days of the disease, but I think that bilious vomiting and bilious diarrhœa, even when severe and necessitating re-transfusion, may be regarded as favourable signs since they probably owe their origin to beneficial reactionary forces of immunity developing within the organism, and I think that the cases which showed these phenomena most severely after employing the continuous method were just the kind of cases which I previously lost from hyperpyrexia when other methods were adopted.

Other less hopeful signs which do not owe their origin to any beneficial process may now become manifest; they are due to the
malignant effects of the disease during the stage of collapse; in some cases they show themselves in signs of gross vascular lesions, such as cerebral or pulmonary thrombosis, probably also suppression of urine from blocking of the renal glomeruli, or there may be a complete failure towards any effort to reaction; we may call this heart failure or by any other name, but the underlying cause is probably due to molecular changes throughout the whole organism of an intimate biochemical union of toxins with tissue elements.

In both types of the disease saline transfusion is the physician's sheet anchor; at first sight it might seem illogical to hasten on with saline in two conditions so dissimilar, but a correct appreciation of the action of saline, when given by Cox's method, will satisfactorily dispel any doubts as to its meeting satisfactorily all the indications of both conditions.

We must not think of it as simply being a means of restoring to the body the fluid that has been lost as we would, say in a case of P. P. haemorrhage; we must think of it when given by Cox's method from three different points of view, keeping in mind that it is given in very large amount, and that transfusion is continued with long after the patient has recovered from symptoms of collapse.

1. Its first effect is to replace the amount of fluid which has been drained away, thus diluting the concentrated blood and permitting a more ready flow through the capillary system and at the same time it gives to the blood the necessary volume to stimulate the heart's action. In this way it serves to sustain the nutrition and oxidation of the tissues so essential to their healthy condition and their powers to elaborate opsonins or antitoxins.

2. We must think of it, too, as a diluent to toxins, a most important factor in a short sharp disease like cholera, which either kills quickly or is itself thrown off by a rapidly developed immunity. By diluting toxins we are saving the tissues from the concentrated action of toxins during the short period when the tissues are most vulnerable to their action. If the tissues can be protected in this way during the first severe brunt of the disease, immune forces will soon be developed and render the defence permanent.

3. Its third action is no less important than the two preceding; it comes into play after collapse is over and the blood pressure has been raised; the saline is now an eliminant, and it is as an eliminant that saline given by Cox's method differs from saline given in any other way. I would particularly impress this action on you all; once you have fully appreciated it and seen it practically carried out, you will, I
am sure, become like myself, keen opponents to the school of practitioners who advocate calomel and other purges for this purpose, for just as often as not they only end in aggravating and irritating by useless vomiting, a patient already in extreme agony. Saline does all this satisfactorily without distressing the patient and in as quick time as any purgative given by the mouth and retained could do. As elimination goes on, transfusion is kept up as long as possible; the rice-water-like stools of cholera soon become replaced by what appears to be clear water with clear pieces of mucus floating in it; urine is soon voided and soon becomes abundant and clear; if the patient vomits he will tell you that the vomit now tastes salt. The patient is in fact being irrigated through his blood vessels.

In both forms of the disease the early administration of saline to anticipate collapse if you get the case in time and its long continued use fulfils all the indications of treatment; the preliminary hypodermics of morphia on the one hand and adrenalin, atropine and strychnine on the other hand being only adjuvants. In the toxæmic type a reliable serum would be a great gain; several are on the market, but I cannot speak of these from personal experience. I did use that prepared by Messrs. Burroughs Wellcome in one case, but the serum did not have a fair trial, as I found at the post mortem a complication which may have been responsible for death and which had nothing to do with cholera. I will come to this later when I give you a brief summary of my cases.

So far I have not approached the subject of intestinal disinfectants, although many have been tried and advocated. There are several objections to their use. In the first place a stomach poisoned with cholera is unfortunately, in most cases, unable to retain anything else, and from this cause our best meant efforts to reach the bacilli with disinfectants almost always fail in their object and only exhaust and irritate the patient by artificially produced and useless vomiting. Further, if antiseptics could be retained, is there a possibility of freeing the alimentary canal of cholera bacilli in less time than the organism itself can render them harmless? We must remember that although the cholera bacillus acts energetically it does so only for a short time; it rapidly becomes inert from lack of pabulum or its poisons are rapidly counteracted by the as yet obscure processes inherent in us to develop immunity towards disease germs. A case of cholera recovering under natural conditions does so rapidly; in a few hours or in the course of a day or two at most, reaction sets in, and the cholera bacillus, though still present in the stools and urine of the
convalescent, is no more harmful to him than his life-long companion—the bacillus coli. And further, we have all treated a case, say of typhoid, for periods of three weeks or more with what we believe to be our most reliable intestinal disinfectants; yet at the end of it all a glance through the microscope will at once show how far off we are in accomplishing anything approaching disinfection of the intestinal contents, and it cannot be shown that the cholera bacillus is much more vulnerable to disinfectants than the normal bacteria of the intestines.

I do not mean to disparage intestinal disinfectants. I believe they have their uses and important uses in reducing excessive bacterial growth to somewhere near normal limits but even that requires time, and in a disease like cholera the time limit is too short to enable us to accomplish any useful result. It is better to trust to nature to deal with the bacilli and their products; nature can accomplish that herself and more rapidly than any means known to our art if we will content ourselves in supporting nature where most required and refrain from useless and may be harmful meddling.

[Dr. Thomson now showed Dr. Cox's instrument in operation and explained the various parts of the apparatus and method of adjusting them, pointing out at the same time the salient features of the apparatus, viz., the ease by which an unlimited supply of saline can be fed to the reservoir by simply boiling up a fresh lot of saline when required, how the saline coming from the delivery tube is automatically sterilised within the apparatus by filtration through a Berkfield candle, the simplicity of sterilising the delivery tube and Berkfield candle by simply boiling them in the first quantity of saline prepared, the mechanism by which the saline is kept at a constant temperature previously decided upon by the operator.]

Continuing he said:

The rate of flow will depend upon the height of the apparatus and the thirst of the vessels, but with the length of delivery tube here shown, about two and a half feet after allowing for some 'slack,' I got in, on an average about twenty pints in the course of five and a half to six hours, and this quantity is a fair average to give at the first transfusion; some of my patients had more, some less.

Long before this, however, all symptoms of collapse have disappeared; in fact an attack of shivering commencing about half an hour after the commencement of transfusion, heralds in the reaction phase. This shivering lasts from five to fifteen minutes at most; the body then begins to become warm and a sense of comfort and relief comes to the patient; vomiting may still go on; purging always, but the vomit is clear and watery and tastes salt to the patient; the stools become more and more watery in appearance and soon lose the peculiar odour of cholera dejecta; they consist now of clear water with clear pieces of
mucus floating in it; the opalescent rice-watery appearance of a typical cholera stool has quite disappeared; urine may be voided early, but in practically every case it is voided several times before the operation of transfusion is completed; at first it is scanty and highly coloured, but soon it becomes abundant, clear and colourless; in some of my cases a condition of polyuria set in; the inference from all this is that the saline is being rapidly eliminated that the patient is being irrigated through his blood vessels. The temperature rises, and Dr. Cox, in his report for 1908, mentions that he made it a rule to endeavour to continue transfusion until the temperature reached 103-104 F., but in none of my cases did I get such a high reading; the highest I got in one case was slightly over 102 F., but that only for a short time; with further transfusion the temperature began to fall. Personally I do not think that the temperature is the guide to go by to indicate when to cease transfusion. I depended upon an appearance of overfilling up of the features, and when this became distinctly evident I removed the canula. Transfusion continued beyond this point causes giddiness and might easily lead to cardiac distress or oedema of the lungs.

Soon the clear watery stools and vomit become replaced by grass-green discharges, showing that the previously inhibited hepatic function has been re-established; in fact in re-establishing itself the liver goes too far for the comfort, and in some cases even for the safety of the patient, and in several of my cases severe and continuous bilious vomiting and diarrhœa was the most troublesome feature of the attack and was so severe and persistent in three of my cases as to bring about a collapse of exhaustion necessitating another transfusion on the fourth or fifth days of the reaction period; this form of collapse is quite a different thing from the collapse with may come on within a few hours of the first and which is a true choleraic collapse due to the activity of the disease and not merely to the exhaustion of reaction; it is not very alarming, and after the second transfusion, which need not be more than about 10 pints, the patient speedily makes a good convalescence.

The real complications during the reaction stage are, however, not due to reactionary efforts on the part of the patient, but to the lethal effects of the disease during the original collapse period, and by anticipating collapse and transfusing before that dangerous period is developed, there is good hope of preventing these complications, which so often end fatally and which no treatment can ever influence in many cases. Chief of these are hyperpyrexia, uræmia, pulmonary and cerebral thrombosis, and general toxæmic destruction, which last never shows any tendency to react.
Hyperpyrexia never gave me any trouble in the cases I treated by Cox's transfusion, but during former years, when other methods were used, this was my most frequent complication and cause of death; it came on immediately after the collapse phase, that is, during the earliest phase of reaction and was most marked in the severest toxæmic cases; these cases, I think, if treated in the first instance by Cox's method would have followed the course of the bilious cases above described.

One of my patients died of uræmia, but as a chronis abscess, probably tubercular, was discovered P. M. in the right kidney; it probably played a part in the fatal issue. This, I may mention, was the only death I had out of nine European cases successively treated by Cox's method. Another patient showed signs of uræmia, but recovered after I myself had abandoned all hope; he had a true choleraic collapse within 24 hours of the first transfusion, which necessitated a second transfusion equal in amount to the first, viz., 18 pints, so that altogether in the course of 24 hours he had 36 pints of saline, and I am inclined to think that the large amount of sodium chloride given during such a short period may have interfered with the proper eliminating functions of the kidneys in so far as the solid constituents of the urine were concerned; there was no suppression of urine, but on the contrary he had a condition of polyuria; urine was voided in large amounts clear and limpid, of low specific gravity and containing a fair amount of albumen; it resembled the urine of chronic Bright's disease rather than the urine one would expect to find in a case of acute post-choleraic renal trouble. I treated the complication with hypodermics of pilocarpine; four injections of \( \frac{1}{2} \) of a grain each were given during the course of two days, one each morning and evening; the effect was most satisfactory, and the patient made a good recovery, but unfortunately after I had told his wife and friends that his condition was hopeless. This patient may have been a subject of chronic Bright's disease; on his recovery he returned to Shanghai, and I did not get an opportunity to examine the urine at a later period, but when he left there was still a small trace of albumin and the urine was of low specific gravity.

In previous years I have had patients die of pulmonary thrombosis and what might have been a similar condition of the cerebral vessels, but in none of my European cases treated by the continuous method did I observe any tendency towards such complications.

I feel satisfied that this continuous intravenous method is not only the best method to adopt to relieve or save a patient in the first acute collapse phase of the disease but that it is also the method par excellence which does most to insure freedom from the post-choleraic
complications so usual and so fatal in cases which get through the collapse after the employment of other methods, and this favourable effect is, I think, due to the free elimination of toxins resulting from its use.

Regarding the time to commence transfusion I think it is better if possible to anticipate collapse and to start transfusion as soon as the case comes under treatment; our motto should be, to dilute and eliminate toxins as soon as possible and so save the tissues from the baneful effects of their concentrated action; if the case is overpurging and threatening the second danger of excessive drainage, give a hypodermic of morphia, but in the absence of sufficient purgation give a hypodermic of adrenalin, atropine, and strychnine, wash out the bowel, and if the patient is likely to retain it, a dose of calomel by the mouth, but it is better not to annoy the patient with repeated doses of calomel if the first causes vomiting, as the transfusion will quickly start elimination and that without exhausting the patient's strength.

To sum up the remainder of the treatment, continue transfusion until the features are distinctly puffy, unless signs of cardiac distress become manifest or the patient complains of feeling giddy; then keep a close watch over the patient both day and night for about a week or until you feel satisfied that no further trouble is likely to arise; do not give food in any form for at least four days, but as much water or weak tea, without sugar and milk, as the patient likes may be allowed.

The withholding of food for four days is a most important part of the treatment; during that time cholera bacilli are still present in the bowel and the patient has not yet developed his full powers of immunity if therefore pabulum is supplied to the bacilli in the form of patient's food there results an increased growth and a proportionate development of toxins, which will frequently cause a relapse to the original condition; the patient can exist quite well for many days without food, and we should be very careful to avoid giving anything which would be likely to resuscitate the enemy he has so nearly vanquished.

The condition of the intestinal contents has a great deal to do in determining how serious a case of cholera is likely to be. I have had two striking instances of this during two outbreaks of the disease amongst the inmates of the general hospital here; during both outbreaks all our serious cases were amongst patients who had been convalescent from their original diseases and who were on full diet previous to infection, and the mild cases were amongst those who were on the usual milk diet of typhoid; for instance in the outbreak of last
The Chifla Medical Journal.

summer we had altogether five patients attacked; two were mild, and although for a time they looked and felt very ill, neither of them required transfusion; previous to infection both were on a strictly milk diet, one was convalescent from dysentery and was just commencing light articles of diet, and his attack required only one transfusion; the remaining two were surgical convalescents; both had very serious attacks and both required two transfusions.

During last summer I treated, amongst Europeans, nine cases of cholera.

(a). Two were mild and did not require transfusion.

(b). Two were cases of moderate severity in which toxæmic signs were not much in evidence; both required a single transfusion; one of eighteen and the other of fifteen pints.

(c). Four were serious infections and toxæmic in type, and each required two transfusions:

(i). Three were retransfused on the 4th or 5th days of the disease, but the second transfusions were necessary to counteract exhaustion produced by continuous bilious vomiting and diarrhoea during the reaction phase. I would not call these relapses of a true choleraic collapse, but rather collapse of exhaustion from excessive reaction.

(ii). One was retransfused on the second day of the attack; this was, I think, a true choleraic collapse, as the symptoms of reaction were in abeyance; it seemed to be a case where the choleraic process had been delayed but not stopped and in which a true reaction to the disease had not been asserted. This was the case in which uræmic symptoms supervened but which happily ended in recovery. I omitted to mention that in this case, hoping to be able to prevent the troublesome bilious vomiting and bilious diarrhoea which I had observed in my former cases, I gave two grains of calomel every hour until eight grains had been taken after the patient had rallied from his first collapse and whilst he was still full up with saline. I have wondered if this had anything to do in bringing about a second collapse so soon after the first.

In this series the first three cases received on an average 22 pints at each of their first transfusions and 10 pints at each of their second transfusions, that is, each received in all an average of 32 pints.

The fourth case received 18 pints at each of his transfusions, and on each occasion transfusion had to be desisted from on account of giddy sensations.

(d). One patient required three transfusions. He was admitted from a gunboat in a condition of complete collapse; after the first transfusion of 15 pints he remained uræmic, passing only small quantities of urine; vomiting and diarrhoea persisted, and as he began to look pinched a second transfusion was given on the fourth day, but urine still remained scanty and finally stopped, altogether, he was getting more and more Uræmic and as ordinary methods failed to bring about any change in his condition, and as he was certainly dying I resolved to try if I could force the kidneys with "saline pressure," so with this object in view transfusion was resorted to for the third time; it was kept on continuously throughout the whole afternoon and evening. I did not note exactly how much was given, but I kept it up until urine was passed; during the night he filled two large chamber pots with pale limpid urine; he kept on urinating, but the symptoms of uræmia never improved, he never developed consciousness again and died on the following day. At the post mortem a chronic abscess was found, probably tubercular and about the size of a chestnut, in the right kidney.
The mortality in my European practice therefore works out at 11.1 per cent., including all cases, or excluding the two milk cases not transfused, at 14.3 per cent, for severe cases transfused by Cox's method.

I also treated three native cases, but with unfortunate results, and in neither of these did the treatment get a fair trial.

(1). One was an old man, over sixty years of age; he had been lying in a state of extreme collapse on board a steamer throughout a whole night; a native physician had been in attendance and had tried all the usual native remedies and finally abandoned him as hopeless. On admission to hospital his discharges were sanious and that is the very worst type of cholera. He rallied from his first transfusion and from his second, which was given three days later, but the sanious discharge never ceased, and he died completely exhausted on the 10th day of his disease.

(2). The second was an Anamite policeman, also admitted in a state of extreme collapse; he was transfused a second time on the second day of his illness, but he did not develop any favourable signs of reaction and died on the following day. I found afterwards that he had been a confirmed opium smoker for many years, and it is possible that the withdrawal of opium may have interfered with his recovery.

(3). The third was an elderly but robust native lady whom Dr. Skinner attended in her own house; she rallied after her transfusion, but during Dr. Skinner's absence she was given opium to smoke; she was not an opium smoker, and we never learned just why she was treated to it at this time; anyway she fell into a deep coma and died that same day.

These three cases cannot be said to have been fair tests of the treatment; long continued collapse may cause gross circulatory lesions or bio-chemical changes throughout the whole system beyond the power of any treatment man can ever employ, and the influence of drugs, such as opium and alcohol, needs no comments.

In my European cases, with one exception, I was fortunate in being in a position to anticipate collapse by timely transfusions, that is, I was able to save the tissues from the malignant effects of circulatory stasis and from the concentrated action of toxins, and by continuing transfusion steadily throughout at least a part of the eliminating period I was able to continue to protect the tissues until they themselves had developed the necessary immunity to resist the disease.

To anticipate collapse and to continue transfusion as long as the patient can stand it are, I think, the golden rules in the treatment of cholera, and Dr. Cox's apparatus makes this possible anywhere and under any conditions, owing to the simplicity of sterilising the delivery system and the ease by which the process of feeding it can be carried out in any household, and as I have pointed out the instrument itself sterilises the saline and keeps it at a constant temperature.
The last case I attended was treated in a private house. I was called to it at midnight, and as symptoms were extremely urgent and distilled water not available without loss of time, which meant life or death to the patient, I had to go to the kitchen kong for water to prepare my saline; the patient had 36 pints in all of saline so prepared, yet he made a good recovery and without showing any signs of the possible septic infection I naturally feared from such a source.

The value of the instrument for any transfusion purpose is of course obvious and particularly to those situated in inland places or who may not have at hand a reliable means of sterilising a large reservoir and large quantity of water.

---

**SPRUE: ITS DIAGNOSIS AND TREATMENT.**

J. Howard Montgomery, M.B., Ch.B., Changpoo.

It is with considerable diffidence that I venture to draw your attention to the very important, interesting and difficult subject of sprue: its diagnosis and treatment, for it has not fallen to my lot to have the opportunity personally to observe and investigate many cases of this disease, so at the outset I wish to state that what I have here gathered together has been culled chiefly from medical men in South Fukien, whose opportunity for seeing and observing cases has been greater than my own, and partly from miscellaneous writers in medical papers and journals and lastly from the excellent treatise on the subject by Dr. W. Carnegie Brown, published last year. In a short paper it is obviously impossible to cover the whole subject, so I have chosen merely to deal with the diagnosis and briefly the treatment, guided to this by the obvious fact that after all, the important thing for busy doctors practising in the East is to be able to recognize the disease and to have a sufficiently thorough knowledge of the treatment to aid the patient towards recovery until perhaps they can be placed under the care of a specialist; hence such interesting points as the literature and history of sprue, its pathology, morbid anatomy, aetiology, climatology, race, sex and age incidence must be passed over with a strong recommendation for those who have time to spare to look into these interesting questions and do their share in observing and recording facts connected with them, for it is only by the united and untiring efforts of workers in every place where the disease is prev-

*Read before the Kuliang Branch, summer, 1909.*
valent, that the subject of sprue can be removed from the realm of theory, speculation and uncertainty and placed in the realm of fact, proof and certainty.

Even to confine oneself merely to the diagnosis and treatment, one is at once confronted by perplexities and difficulties on all sides, and it will be my aim to marshal the more important uncontestable points in the diagnosis, together with an outline of the methods of treatment which have proved themselves of service, leaving the more debatable questions till our knowledge is further advanced, with the hope that hereafter we may neither fail to recognize the disease, or be at a loss to take up some definite line of treatment.

AS TO DIAGNOSIS.

For convenience of description, and as an aid to memory and further on account of the marked differences of the symptoms, it is best to divide the symptoms into two phases or stages.

First Phase.—To merely state that the onset is insidious and uncertain is, after all, not much help in diagnosis, for it may justly be argued that most diseases affecting the alimentary canal and prevalent in the East are alike in this respect, and yet when one recollects the various diseases with which it may be and often is confounded, this point is one of importance. As a rule before the appearance of any objective symptoms there is a general feeling of lassitude and malaise, a disinclination for work, and even when braced by a vigorous mind and strong will, the patient requires to put forth an extraordinary effort to even partially fulfil his duties, which formerly he delighted in and was eager to perform thoroughly well. This continues for an indefinite period, days perhaps, more generally weeks, and occasionally months and then follows the first objective symptom—a disorder of the mouth. At first this may be trivial and hardly noticed by the patient—at times it is severe and may send the patient for medical treatment. This so-called mouth lesion may be situated on the edge of the tongue in the position so frequently occupied by an epithelioma of that organ; as a rule at first merely a few congested reddened spots or more frequently perhaps as distinct small vesicles. The patient frequently informs you that these have been present before and disappeared quite spontaneously and was thought by him to be merely due to indigestion, constipation or perhaps a roughness on a neighbouring tooth. If seen later the patient complains of itching around the vesicle and later still a stinging and smarting pain, much aggravated by certain articles of food, which experience soon teaches him to avoid, such as
vinegar, curry, lime juice, aerated waters, spirits and highly spiced foods, and he is only able to take, without discomfort, the most bland and usually the most insipid foods. Seen at a more advanced stage the whole tongue seems involved; it appears smaller and redder, the mucous membrane abnormally dry and glistening, at parts on the dorsum especially may be abraded patches and apthous plaques, and it is well to recollect this is the position where syphilitic lesions are apt to show on the tongue, and further there may be fissures of varying depths, but alike in having their long axes parallel to the long axis of the tongue. Situated on the edges now, and nearer the tip may be seen distinct vesicles or bullae of herpetic type, or the bullae may have burst, leaving ragged ulcerated sores, which may readily heal, only to be followed by a new crop, or they may persist for some time as indurated angry ulcers, and being near the tip are in the position most frequently assumed by tubercular ulcers. Occasionally these vesicles, bullae, or ulcers are seen on the fraenum. From the appearance presented by the tongue, it is easily seen the pitfalls ready for the unwary, and one must eliminate epithelioma, syphilis and tubercle and make sure the irritation is not being caused by a tooth before entertaining the diagnosis of sprue, and it is hardly possible from the condition of the tongue alone to form a diagnosis.

Concomitant with these phenomena there is a very excessive accumulation of mucus in the fauces, so thick and adhesive that it is a difficult matter to clear the throat, and it may be bad enough to bring on violent retching. At this stage a general examination elicits nothing of much note, no wasting, no splenic enlargement, no pyrexia, no albuminuria and no intestinal trouble; there is, however, a slight enlargement of the liver and some tenderness, and this physical sign is regarded by practically all observers to be constant, and is the more remarkable because of the marked diminution in size of the liver in the second phase. Following still further the course of a case there is evidence of invasion of the oesophagus with difficulty of swallowing, accompanied by acute pain and then follows the symptoms of acute acid dyspepsia, for which frequently the patient first seeks advice. This lasts for a variable period, improving and recurring in an unaccountable way and then a special type of diarrhoea sets in. In the early morning, between 4 and 6 a.m., the patient has spasms of pain, and later two or three motions are passed usually with much flatus and some tenesmus. The stool is copious, loose, green to black in colour (if not taking drugs), and the patient feels great relief and is ready for the morning meal. The stool consists chiefly of bile and
mucus with an alkaline reaction and is a most constant and characteristic feature of true sprue. This persists as a rule for 10-15 days and then subsides, and there may be a return to fairly normal health, or quite indifferent health with acute attacks of diarrhoea and indigestion. These then are the more important indications of the first phase of sprue.

**Second Phase.**—Let us look now at the second phase of this disease. The patient may suddenly or more gradually exhibit the second and better known phase of sprue, characterized by a persistence of the mouth troubles, a secondary diarrhoea of a totally different type from that already described, marked diminution in the size of the liver and a peculiar dyscrasia which implicates the blood and general metabolism in a definite way. Let us consider each of these points in sequence.

**Mouth Symptoms.**—In the second phase this varies but little from the primary phase already described, and may be passed over now, but not forgotten, as they still persist in the majority of cases.

**Diarrhoea.**—The motions become more frequent 6-8 daily or mayhap even more, and although occurring in the morning, are not confined to any particular time, but are spread over the whole twenty-four hours with usually one immediately after food has been taken. The motion is loose, large in amount, pultaceous and almost free of bile pigment; the colour being a dirty brownish white, easily distinguished when once seen from the pale clay-looking motion of obstructive jaundice; it is very gaseous, readily ferments, and gas bubbles are frequently seen when the motion is semi-solid, and if more watery appears as a froth on the surface—a motion corresponding exactly to the above description is almost pathognomonic of sprue. There is little or no mucus in the stool, and blood, if present at all, is fresh and not mixed with the dejecta. The reaction is distinctly acid in contrast to the alkalinity noticed in the stool in the first stage. Experience has shown that a meat diet at this stage makes the stools more offensive; farinaceous food less so, while with a diet of milk and fruit they become practically odourless. In some cases the patient suffers little or no pain, whilst in others it is considerable and griping spasmodic in character. This diarrhoea becomes chronic and, if untreated, may persist for years with periods of improvement perhaps, but again lapsing into the old condition, and it is these periods of quiescence and improvement that give rise to bright hopes, so soon blighted by a return of the symptoms, and is the cause why so many drugs happening to be exhibited just at such a time become falsely landed as beneficial or even a specific for the disease. Any slight indiscretion on the part of the patient as regards diet, chills, fatigue, or worry is apt to bring about an exacerbation of the symptoms and is frequently accompanied by fresh mouth sores. Accompanying this diarrhoea is always, one may say, continuous dyspepsia even in spite of careful dieting and the patients' appetite may entirely fail or be extremely capricious.

**Liver Symptoms and Physical Signs.**—The most marked physical sign of the second phase is reduced hepatic dullness; the enlargement, tenderness and discomfort attending the first stage disappears and contraction of the organ follows. This shrinkage is uniform; there are no nodules, no manifest hardening, no loss in regularity of outline, and careful palpation fails to detect the formerly prominent lower border. The vertical diameter of the organ is reduced from
The Dyscrasia.—Failure of nutrition is very marked; it is insidious in its onset and may not be observed for three months after the motions become devoid of bile pigment. The muscles become lax, flabby and small, notably the deltoid, biceps and calf muscles. The subcutaneous tissues also suffer and fat is very deficient, with the result that there is a great loss in weight. The blood is also involved by this apparent toxaemia; it coagulates more slowly; the red cells are reduced to 2-3 million per c.m., whilst contrary to expectation the haemoglobin is increased. There is no poikilocytosis, no vacuolated or nucleated red cells, and from these facts it is held that sprue is an intoxication, and resembles the toxin introduced into the body say in lead or arsenic poisoning, which produce similar effects on the blood. There is a relative leucocytosis; the proportion being about 1,400, but there is no absolute increase; in fact there is absolute diminution, and they average about 6,000 per c.m., Lymphocytes remain about normal in proportion; while mononuclear and eosinophile cells are relatively increased; the polymorphonuclear being relatively diminished; these changes persist throughout the disease and seem but little affected at first by a change to a colder climate. The marasmus peculiar to this disease is quite characteristic in the second phase; the complexion is muddy and sallow looking; the expression listless and careworn; eyes dull heavy and the sclerotic a dirty white. Under the clavicles, between the scapulae, or on the inner aspects of the thighs may be seen patches of pigmentation; the patient’s extremities are cold and clammy and perspiration may be excessive and offensive.

The foregoing are the most reliable and characteristic symptoms of the second phase. Briefly let us trace a neglected case to its unfortunate termination; as time goes on the emaciation becomes extreme, bed sores form, the lips are dry and cracked, the teeth become thickly coated with sordes. The circulation is involved; the pulse is more rapid, irregular and deficient in force, blood pressure falls; œdema of the legs sets in with albuminuria. The abdomen distends, diarrhoea is excessive and becomes watery or even choleraic in nature; in short the whole digestive system is so involved that it cannot perform its functions. As death approaches the diarrhoea ceases the abdomen contracts, the vital powers are exhausted and the heart fails, the mental faculties remaining clear to the end. Fortunately all untreated cases do not end so; some pass into a latent condition, and although subject to great discomfort and gastro-intestinal derangement, the patient enjoys fair health and toxæmic symptoms never become so alarming.

It is not too much to assert that the patient’s life depends on the early recognition of the disease, the prognosis being chiefly dependent on what stage the disease has reached; and therefore the importance of having a thorough grasp of the symptoms of the disease cannot be exaggerated.

Having now got sufficient facts upon which to make a diagnosis, let us turn to the treatment of the malady, and before giving any
details of the methods at present in vogue, let us first disabuse our minds of an idea that seems prevalent in the minds of many doctors, and especially those who have had little opportunity of watching cases and who judge merely by the few exceptions, not the majority of cases. I refer to the idea that sprue is a hopeless disease to treat, that little can be done for the patient and that the result is ultimately in the majority of cases fatal. The experience of almost all authorities on the subject is contrary to this, and although the most experienced differ on almost every point regarding the special form of treatment to be adopted, yet all are unanimous in claiming that the patients under any of the recognized forms of treatment are markedly benefited, and the result in the majority of cases is a cure, and with reasonable care and precaution a permanent one.

The treatment naturally falls under two heads: 1. Dietetic. 2. Medicinal. All are agreed that the dietetic treatment in the present state of our knowledge (or should we say ignorance) is the more important; drugs may be a valuable aid to recovery; whereas dieting alone has, in numbers of cases, ended in a complete cure; whilst drugging without dieting usually ends in disaster and disappointment.

FIRST THEN, THE DIETETIC TREATMENT.

It can for convenience of description be divided into three groups, which by general usage are now familiarly called the milk diet, the meat diet, and the fruit diet. More important even than the choice of which diet one will adopt in any given case are the following considerations which, if neglected, any or all of the methods may fail; firstly, the treatment must be begun early; secondly, it must be regulated according to the progress of each individual case; and thirdly, it must be persisted in for some considerable time after all symptoms of the disease have disappeared; keeping these points in mind, it is open for the physician to choose the diet he means to adopt.

The Milk Diet.—If fresh milk is procurable, the trial first of milk to the exclusion of everything else is to be recommended, as this seems undoubtedly in the majority of cases to give the best results, provided the milk is pure and rich. It is impossible to give the milk diet in detail, and if a case presents itself reference can be made to a work on the subject such as the one already mentioned; a summary only being attempted here. Given then a case of sprue at an early stage and a good supply of milk available, treatment is at once begun by sending the patient to bed; flannel should be worn next the skin, and some advise
an abdominal belt as an additional comfort and a preventative against chills, but it is doubtful if this is necessary or advantageous. To clear the bowel of any undigested or fermenting material, it is well to give an aperient, preferably castor oil, with or without salol, $\frac{3}{ii}$. of the B. P. mistura. Oleum ricini answers well and may be followed by 10 grs. salol. When this has acted, weigh the patient and keep a systematic record of the body weight throughout the course of treatment, as it is a valuable help in prognosis as well as the best means of knowing if the diet suits the individual. Milk is then given, beginning with sixty ozs. (three pints) during the twenty-four hours, divided into seven meals during the day and one at night, or smaller meals may be given at more frequent intervals, but whatever be the times given, the important point is that the milk be taken slowly, and many recommend to ensure this that it be sucked through a straw. In cold weather warm the milk to 90° or 92°, but in hot weather it may be given cold, and if one is absolutely certain of the purity of the milk, it is better given neither boiled or sterilised. If the stools under this treatment become more solid, the abdomen less distended, the mouth less sore, the milk may be increased; a good plan being to increase at the rate of 10 ozs. every fourth day till 110 ozs. per day is reached or even 120 ozs., and when this maximum has been reached, it should be continued for a further period of ten days. Weighed at the end of this time the patient will probably have gained nothing; in fact he may be lighter, for the food given is just sufficient to maintain life without feeding on the tissues.

If things are going well, the appetite returns, the patient feels more vigorous, abdominal distension disappears, mouth sores heal, mucus ceases to form in the throat, the skin and conjunctiva become clearer, the diarrhoea, though not checked, is less frequent and griping is less severe. With such an improvement the patient may be allowed up a little, the milk may be further increased, raw eggs and easily digested starches may be given and this continued for six or eight weeks. At the end of this time, if progress is maintained and there is no aggravation of the diarrhoea and no fresh mouth sores, fish may be added and later chicken till the patient soon gets on to an ordinary light diet. To prevent any possible chance of scurvy arising, some recommend, even with the milk diet, to give strawberries if procurable, and no harm comes from this addition for which the patient is truly grateful.

The Meat Diet.—If milk fails, or if it is not easily procurable, or if not sufficiently rich, an alternative may be had by a diet of meat
to the exclusion of all other foods. Theoretically this would seem preferable, as meat is more easily assimilable, the residuum more nearly approaches the natural dejecta of an adult, and animal food is less likely to be followed by constipation, and produces a good flow of gastric juice almost immediately after entering the stomach, whereas with milk, it is after a period of three hours that the highest rate of secretion is reached; hence where milk is continuously given, this delay in coagulation and peptonisation is obviously detrimental to assimilation, and again the initial loss in weight on a meat diet is less than on a milk diet, and the length of treatment shorter on a meat diet than on a milk diet, yet in spite of these apparent enormous advantages they appear merely theoretical, and experience has shown that a meat diet is not as safe and satisfactory as a milk diet in the great majority of cases. Given a case not doing well on milk or where a good supply of milk is not easily procurable, and where meat is readily obtainable, the plan of treatment is as follows: As before give the patient an aperient and confine him to bed. Beef and mutton are preferable to other forms of meat; some recommend veal, but it is rather insipid without condiments, which are not allowed and is apt to aggravate the diarrhoea; pork in any form is inadmissable. Chicken in the tropics is often the only flesh available, and while of much less value as nutriment has the advantage of being easily assimilable and can be used, though not for so prolonged a period as beef and mutton may. Glandular tissues, such as liver and kidneys, are to be avoided, though sweet breads are allowable. To obtain sufficient nutriment 2 lbs. of beef may be allowed per day; this seems a large amount, but experience has shown that sprue patients stand this amount easily. In all cases the meat should be slowly and lightly cooked, and it should be remembered that meat in solid form is preferable to meat essences, meat juices, or even raw meat juice. It is convenient to give six meals daily—at 7 a.m., 10 a.m., 1, 4, 7 and 10 p.m., giving 4 ozs. at each meal, making a total of 24 ozs. of cooked meat, which is roughly the equivalent of 2 lbs. raw meat. An hour before each meal a few ounces of warm water, rice water or toast water is allowable, but toast bread or even rusks with the meat must be strictly forbidden. A little Chinese tea with lemon juice, instead of milk, may be given twice daily and is very acceptable. After about 8 days of this rigorous treatment a change is advisable, and if there has been improvement in the symptoms, for the morning meal of meat may be substituted a couple of fresh lightly boiled eggs, and for one evening meal say the seven o'clock one a little fish. Gradually add a
little roast chicken, and if the improvement has been marked, bananas, ripe grapes or oranges may be added. In some advanced cases meat in solid form cannot be borne, and one must rely on either raw meat juice, which is to be preferred if procurable, or beef essences and extracts of meat; the physician choosing whatever kind he thinks most nutritious and easily assimilated. Although I do not hold a brief for or receive a commission from either of the two firms I am going to name, yet I venture to recommend Valentine's Beef Juice if not used with hot water, which coagulates the albumen and renders it more difficult to digest, and Brand's Beef Jelly or Essence. These are readily borne by the weakest subjects, and in spite of recent adverse criticisms on their value as nutritive agents, still hold a place not easily filled by anything else. A mouth wash is absolutely necessary, especially with a meat diet; as there is always a feeling of alkalinity, it must be bland and unirritating, and for this many extol the virtues of listerine, or a very weak solution of tinct. myrrh and borax.

_The Fruit Diet._—Never having seen a case treated by this method I hesitate to touch on it and will merely mention what fruits have been tried with apparent benefit, in the hope of gaining from some one who has had experience of this diet some further light on the subject. In the East bananas and pineapples seem to hold the field against all other forms of fruit, but mangoes, maugosteen, lichees, figs, pumeloes, and other rarer fruits are also upheld as beneficial. Some have used and with success a diet of only bananas and water, but most seem to think that bananas with preserved unsweetened milk is a better diet, giving per day 12-16 bananas with 60 ozs milk. Pineapple being of so little nutritive value, must be supplemented with preserved milk, and it must be added that not a few condemn pineapples as worthless or even harmful. Good pumeloes and milk are said by some to form a very satisfactory diet, while others extol the benefits derived from mangoes and mangosteen together with lichees or rambutan, the Malayan representative of the lichee family. In India, Ceylon and Indo-China the bael fruit has been used for sprue and indeed for all kinds of diarrhoea, but is now falling into disrepute. The papaya is supposed to be the most satisfactory substitute for strawberries in the East, and has a high nutritive value and must not be forgotten, but in some places strawberries can be obtained and used. At home strawberries, pears, grapes, apples, bananas, apricots and peaches form the chief varieties of fruits allowed, and are usually prescribed along with milk.
THE DRUG TREATMENT OF SPRUE.

Perhaps for no other disease have more drugs been proposed, tried, retried and discarded than for sprue. The great difficulty in finding any drug which acts beneficially, being due to the fact that sprue patients often spontaneously and quite independent of any drug take a turn for the better, and any drug happening to be exhibited at this particular time, is credited with special properties, and the doctor who prescribes it becomes an enthusiast about it and extols it as a specific cure; others less enthusiastic give it a trial, and not happening to have a case improving when it is tried, are disappointed with the result; this the enthusiast puts down to some idiosyncrasy on the part of the patient, whilst the unsuccessful practitioner puts it all down to the fad of the enthusiast, and so we struggle on in doubt and uncertainty; the obvious reason being as just stated.

It will be more convenient first to mention the drugs which are harmful in sprue, as there is more certainty and fact here, whereas when we speak of those aiding or curing the disease we are at once on a battle field of opposing contentions. Of the commonest drugs one is apt to use for checking diarrhoea or relieving dyspepsia and accompanying pain, may be mentioned bismuth salts and mineral acids; both these drugs seem particularly harmful, and bismuth must never be given while acids are only allowable as tonics and alteratives after all diarrhoea and mouth sores have disappeared. Any astringent must be used with extreme caution in sprue, as indeed in any disease of the intestinal tract where there are large amounts of undigested food. Special reference must be made to catechu, kino and tannin, including the much vaunted derivatives of this drug, such as tannigen, tamalbin and tannoform as being very likely to do harm to the patient. Iron and arsenic may not be prescribed, although from the condition of the blood one might think they would be of value, but they frequently cause, according to most observers, diarrhoea to become more marked and bring on vomiting and exhaustion, though Sir P. Manson still advocates muscular injections of minute doses of arseniate of iron. An emetic is often necessary to relieve the dyspepsia; if so emetine or apomorphine, on account of their depressant effect, must not be used, and experience has proved that powdered ipecacuanha root in doses of not less than 20 grs. is the best to use in sprue.

As to the specific remedies used in sprue and vaunted as cures, these are many, but it is extremely difficult to estimate their real value or action, for as already pointed out careful dieting will cure the
majority of patients without medication hence the difficulty of knowing if any improvement is due to the special drug exhibited, or proper diet being adopted, or due to the spontaneous improvement often seen in this disease. Santonin, after exposure to the sun’s rays for a period of six months to a year, has been the sheet anchor of many, whilst others discard it as useless. I do not propose to discuss the merits of these drugs, but merely indicate those most used and praised; it may be noted in passing that as regards santonin the pendulum is swinging the other way, and fewer use it now than formerly. Pilocarpine and jaborandi were much praised by French physicians, but the improvement noticed seemed transitory, and these are being abandoned. Another remedy recently popular in Shanghai and other Chinese ports is carbonate of lime in the form of powdered crab’s eyes or cuttlefish bone, alternating with doses of purgatives, but experience has not stamped this method as of special value. More recently still argilla, a finely powdered dessicated white clay, has come into vogue on the continent of Europe; it relieves the symptoms of diarrhoea in sprue or indeed other forms of diarrhoea in a remarkable way; the dose is large, viz., 3-6 ozs. argilla stirred up with 10 ozs. water, taken slowly through the day; the patient fasting the first 24 hours, and thereafter never to take food until at least three hours have elapsed since he has taken the argilla mixture. It has also been found very beneficial in cholera infantum and may be given in half ounce doses; it is inexpensive and will keep in any climate, and it is well worth a trial in China for other alimentary troubles as well as sprue.

Calomel, hydrarg perchlor, sulphurous acid, cajeput, thymol, menthol, salol, acetezoue and many other allied drugs have been tried with varying but chiefly indifferent results, with the hope of destroying the putrefactive organisms in the intestines, or neutralizing their toxins, and time fails even to mention many other drugs of doubtful use, which are only used empirically in the hope of some day striking a specific remedy. A newer treatment is by means of saverin, which is a culture of bacillus acidi lactici which, when taken with milk, passes almost directly to the bowel and colon and there produces large quantities of lactic acid, with consequent coagulation of the milk and neutralization of intestinal toxins. Cases treated by this method are stated to have done well, but it is only on trial and no judgment can be pronounced.

In a necessarily brief paper (!) there are many drugs not even named, there are methods not discussed, doubtful symptoms of the disease unconsidered, yet my object has been merely to present to you
CASE OF CUT THROAT.
the more important and uncontestable points in the diagnosis, the methods of treatment of tried and proved value, and to impress on all the great importance of early diagnosis and immediate treatment of the sufferer by one of the recognized diets, and lastly to remind you that sprue is not a "hopeless disease" but is amenable to treatment with a low mortality, and if I have in any way succeeded in my object, our time has been well spent in the cursory study of this disease and will not be in vain, but will result in the saving perhaps of many valuable lives.

---

CUT THROAT IN RELATION TO SPEECH.

By E. M. Merrins, M.D., Wuchang.

The patient, whose somewhat ghastly photograph is here reproduced, attempted to commit suicide by cutting his throat. The case has no particular surgical interest, but is reported because it bears on a medico-legal question recently raised in the columns of the Lancet.

According to the man's history, he is one of the victims of our Western civilization. At one time, a respectable tradesman, he contracted the habit of smoking opium, but not to an immoderate extent. Desiring to cure himself of the vice, he was persuaded by friends to use hypodermic injections of morphine to tide over the most trying period of his reformation. In consequence he simply exchanged one bad habit for another very much worse. Soon he began to go steadily down hill, and at last became a beggar. Unable to satisfy his intolerable craving, and with mind unbalanced, for he was always imagining his body was full of scorpions and centipedes, he determined to make away with himself. In an outhouse in the village where he was staying, he hacked at his throat until he had completely cut through the larynx, just above the true vocal cords. Probably his life was saved by the barking around the house of the village dogs; no doubt excited by the odor of fresh blood, which drew the neighbors to see what was happening there. Brought to us on the following day he was very weak from loss of blood, but not in a desperate condition. The wound was cleansed and the severed thyroid cartilage sutured as well as possible. Attempts were made to make him retain a tracheotomy tube, but each time it was inserted, there was such a long and apparently dangerous spasm, the attempt was abandoned. Two days later the patient, who was very troublesome, tore the wound open. No further operative work was done. The patient regained
strength and the wound is gradually closing. He was shown at the last June meeting of the Central China Medical Association.

While he was under treatment, the following letter appeared in the *Lancet* of May 22nd, 1909:

Sir: I shall be glad if you will kindly publish the following in your columns as I am desirous of ascertaining what would be the general opinion on the point. The subject is of great importance from the medico-legal point of view, and I can find no recorded opinion directly bearing on it.

In July last a boy was injured in a village in this district shortly before daybreak. His throat was cut across and the larynx divided just above the vocal cords. The wound severed the facial and lingual arteries and also divided the anterior wall of the oesophagus. He lingered till sunset. Shortly after the infliction of the injury he is alleged to have spoken and made a statement involving certain persons. The nearest medical officer sent for (a medical subordinate serving under me) did not arrive till after the boy was dead. He saw the injuries and held the post-mortem examination. He gave out as his opinion that the gaping wound of the throat rendered speech impossible from the moment of its infliction. Before the case went into court he sought my advice and I fully concurred in his opinion. Medical opinion to the contrary was, however, obtained from outside the district by the defence. It was stated by this authority that the wound “being situated above the vocal cords, it would not have prevented the boy from speaking fairly loudly and fairly distinctly, though the voice would naturally grow fainter as the boy gradually succumbed to loss of blood.”

Now it will be readily acknowledged that sound can be produced when the cut is above the vocal cords, but can it be held that speech would also be possible under the circumstances? Will your readers kindly tell me if they are of opinion that any sound produced in a case like this will reach the mouth and be converted into speech in the presence of a large gaping wound, the presence of blood, possible falling in of the soft parts above, shock of the injury, depressed mental state of the injured, and other attendant circumstances?

I am, Sir, yours faithfully,
R. K. MITTER, M.B., Major I. M. S.,
District Medical and Sanitary Officer.

Our Chinese patient, whose injuries were very similar, was brought to us a day after the infliction of the wound, and I am quite certain that he was then able to make himself understood, though he could only whisper. However, to make assurance doubly sure, as the man happened to be in the hospital when I read the above letter, I immediately went there to satisfy myself on the point. A fortnight had now elapsed since the injury, but the wound still gaped widely above the vocal cords. With the wound exposed and the head slightly extended, he was able to speak so as to be easily understood in a weak whisper. When the throat was bandaged, he was able to speak much more distinctly. Strongly flexing the head so as to close the wound, he was able to speak clearly and well. Like the writer of the letter, on consulting various works on surgery and medical jurisprudence, nothing could be found bearing directly on the point, but there is the
teaching of physiology that the vocal cords simply determine the fundamental tones of the voice; sound being moulded into speech by the parts above. Turning to general literature, this is a point which, if it ever occurred to them, is not at all embarrassing to the poet and novelist. For instance, in Dante’s Inferno there are those with their throats “slit” and others who carry their heads in their hands, whose power of speech is not interfered with in the least by their dreadful punishments. The Chinese horror of decapitation is partly based on the belief that in the next world the head will remain severed from the body, but so far as we know in their opinion this does not necessarily imply the loss of speech. In the gruesome legend of “Don Juan” it is told by Balzac that while the imperfectly resuscitated body of the old reprobate was receiving the posthumous honors of sainthood as it lay in its shrine in the cathedral, “the living head detached itself violently from the body which lived no longer and fell on the yellow skull of the officiant.

‘Dost thou remember Dona Elvira?’ it cried, fastening its teeth in the abbot’s head. The abbot uttered a terrible shriek, which threw the ceremony into confusion. All the priests ran up together and crowded round their superior.

‘Idiot, say at least that there is a God!’ screamed the voice.

Just at that moment, the abbot, bitten in the brain, was about to expire.” As we are here in the realm of pure imagination, and as such methods of evangelistic work cannot meet with approval, it may be well to pursue this part of the subject no further.

The editorial answer to the above quoted letter was as follows:—

“Our correspondent is correct in thinking that in such a case as he describes the voice of the victim would be much impaired, but we cannot agree with him that it would be impossible for a bystander to understand anything the patient said. Even though the injury to the larynx were very complete and the wound gaped greatly, yet it is almost certain that a portion of the expired air would pass into the mouth and would give rise to sufficient voice to be heard and understood. Such an extensive throat wound is unusual as a homicidal injury; in this country at least it is nearly always suicidal, and all who have had experience of such cases will agree that nearly always, even where the injury has been very extensive, it is quite possible to understand what the patient is saying.”—En. L.

In China, such questions fortunately have only academic interest, as we are not troubled by coroners and lawyers, but in the future we may be, a prophecy which we hope will be accepted as a justification of this report. By the way, may the question be asked, Is suicide by violent and painful means becoming more frequent now that it is not quite so easy to obtain opium?
TWO CUT THROATS.

By ELLIOTT I. OSGOOD, M.D., CHUCHOW.

This last autumn a young man was brought into the Chuchow Christian hospital with his trachea nearly cut in two between the second and third cartilages. He had become despondent over a family quarrel and attempted suicide. His mind was unbalanced as well; hence the attempt. A Chinese doctor had tried to sew up the wound with silk thread. Evidently he had not tried to render it aseptic. The act had been done three days before we saw him. He showed little fever, slight loss of blood (no important vessels had been severed) and very little interest in life. What interest he had was distorted. His pulse was rather weak. Breathing was through the wound, although he could make himself understood by use of the vocal cords.

We have for some time been experimenting with a hypnotic preparation made by the Abbott Alkaloidal Company of Chicago. It consists of hyocine hydrobromide, gr. 1/16; morphine hydrobromide, gr. 1/6; cactin, con. gr. 1/2. The company claim for it a special preparation producing a special chemical compound. However, that may be, we have used it in a number of cases with marked success. We have found it never failing and most amazing in its hypnotic action. It most closely resembles the hypnotic spell under which a hypnotist places his subject.

One tablet injected hypodermically produces a quiet profound sleep. Suggestions of sleep are valuable in hastening it. Cotton placed in the ears to shut out noise and covering placed over the eyes to shut out light aids in keeping the patient under the drugs' influence. In severe operations one tablet should be injected a couple of hours previous and another within an hour of the time for operation. The patient remains under the effects of the drug some hours. If by reason of apparent pain or other disturbing feature the patient shows a tendency to awake, a sleep suggestion and the stopping of the operation a moment will send the patient back to slumberland.

We used but one tablet upon the patient above spoken of. Owing to the locality, irrigation was a difficult thing, so we removed the pus and dirt by repeated sponging with a bichloride solution.

A number of times the patient half opened his eyes or moved his arms as though to object to the work. A short stop and he would drift off asleep. We finished the cleansing and sewed up the wound. The patient slept for some hours and woke refreshed without pain.
Two Cut Throats.

His mental condition caused him to work at the dressings until he half reopened the wound. This was two or three days later. He ate very little and showed no mental improvement. His uncle, who attended him, feared he might drop off at any moment and so hurried him back home. We had not much hope for the patient under such conditions, but greatly to our surprise word came a month later that he was nearly well both mentally and physically with only a little leakage at the point of the wound.

Our second case of cut throat was the result of falling into the hands of highwaymen. The victim was on his road home for Chinese New Year. He had risen at daylight and started along his way. About a mile from the town he was attacked, robbed and his money stolen. He lay for a half day before being picked up. Much blood was lost in this case. His saviors used tobacco and other like material to staunch the flow of blood. He was brought to our hospital three days later with a very foul wound. He had been unable to eat food and was in a very weak condition. I was away, and my chief assistant did his best to cleanse and close the wound. He began rectal feeding and succeeded beyond expectation, having never had such a case before.

When I arrived home the stitches were pulling apart, and in spite of repeated irrigations the wound showed a bad condition of sepsis. The assistant had done his work with chloroform. Remembering the former case I used the H. M. C. compound again. One tablet was sufficient for a two hours’ work on his throat.

I found the wound was above the glottis and below the epiglottis. The right larger cornu of the hyoid bone had been severed by the knife. I removed the lower end and cut off the projecting upper stump. The back of the pharynx was injured and septic. The cricoid cartilage had been completely severed. This, with the severed cornu of the hyoid bone, allowed the trachea to drag by its own weight downward, exposing the upper end of the oesophagus. When the man would attempt to swallow, the food or liquid would run out through the wound or over the vocal chords, causing coughing and strangling.

The problem was to remove the septic material and anchor the trachea to the hyoid bone and lower roots of the tongue, so that the epiglottis could again fulfil its mission in directing food and drink into the oesophagus. The wound on the rear wall of the pharynx showed divided tendons and oozing septic discharges. The oesophagus and the trachea, the nasal cavity and the mouth, were all acting as storehouses of pus bacteria.
We worked for two hours cleansing, curetting and stitching. The patient slept on peacefully; once in a while drowsily objecting, but always falling off into sleep after a moment of rest.

The next day, when we changed the dressings, he spoke with almost natural voice. But it was apparent that unless healing was very rapid the pockets of secreted bacteria in oesophagus and post nasal cavity would win out, and so it proved. The man slowly weakened until two weeks after his injury; he died. Gangrene (dry) had already set in over the upper trachea before he passed away.

These two cases were exceedingly interesting to us. The new hypnotic was a revelation. We have found something that can be used in many places where we dislike to use ether and chloroform. It can be used to begin the anesthetizing, and later these other hypnotics can be added if desired. Only a few whiffs now and then are needed to keep the patient in a condition of profound slumber. In obstetrics it is especially valuable, as we have found from experience. There an anesthetic is needed to cover considerable space of time. The H. M. C. mixture acts well and does not retard labor. The only caution that is given is not to use it in advanced kidney lesion.

The wound high above the glottis in the second case was peculiar. How to cleanse such a wound and how to anchor the trachea so that healing may take place, are the puzzling questions which confronted us and which we failed to solve. In another case we may succeed if we ever have one.

The China Medical Journal.
In Consultation.

Ta-li-fu, November 29th, 1909.

Dear Doctor: I thank you for your letter of the 25th ultimo acknowledging receipt of tape worm, and also for your kind offer to help me at any time in getting things at Shanghai.

A few weeks ago I had a letter from Burroughs, Wellcome & Co., in which they incidentally remarked that they were sorry I was having so much difficulty in getting a microscope and that they could save me considerable time and trouble in future if I would place my orders with their Shanghai branch.

I was at a loss to know who had told them that I was having difficulty in getting a microscope, but the Journal arrived a few days later, and I concluded they must have seen my letter in it! I hardly expected you to publish that letter as I did not think it contained anything of general interest.

I got back a short time ago from a trip to T'eng-yueh, where I had gone to attend one of our missionaries in confinement. T'eng-yueh is 12 days' journey west of Ta-li, and on the way one has to cross the Mekong and Salwen Rivers. The valley of the latter has a very evil reputation, and before I came to Yunnan a certain medical man told me it was known as the "Valley of Death."

A number of travellers have spoken of this valley and have helped to perpetuate some of the wild stories the Chinese tell of it. These stories have some truth in them, but being the product of the imaginative mind of "John Chinaman," are enough to strike terror into the heart of the bravest. You hear of people who were taken ill when they reached the valley and the next morning were dead, and also of a tremendous river dragon who is waiting to "drag-on" to death any unfortunate victim who may enter the water.

For the greater half of the year no Chinaman would dare to stay at the village by the bridge, and when I passed through it in the 7th Moon the place was deserted, except for one family of Shans, who were living in the Custom House.

The coolies stopped for a rest, and I got into conversation with the man, and he told me that the disease that the people were afraid of was Ia-pa pai-tsi (dumb malaria), and that the patients succumbed in a few days. From the description he gave me I am convinced that the disease is a form of pernicious malarial fever, in
many cases of which cerebral symptoms predominate, aphasia frequently occurring.

My informant told me that the mortality was about 70 per cent., but I think he was exaggerating. He had had malaria for three seasons in succession, but had been free from it for two years. I examined his abdomen and found the spleen very much enlarged.

The Shans are the natural inhabitants of the Salwen Valley and are not afraid of the disease like the Chinese, who leave the place in April or May and do not return until November or December.

The Shan who gave me the information told me that some cases of plague has appeared at the Salwen four or five years ago, but that there had been none since.

You will be interested in the following: A mason, who was building a kitchen for us, was taken ill a few days after I left T'eng-yueh and died in three days with what one of the foreigners here said were symptoms of cholera.

There has been no cholera in Ta-li, and I feel sure that the case was a form of pernicious malarial fever accompanied by choleraic symptoms.

Malaria is very common in this district, and the malignant forms may be commoner than I am aware of.

Referring again to the fear the Chinese have of the Salwen Valley during the rainy season—June to October inclusive—I may say that I feel sure it is entirely due to the fact that these forms of pernicious malarial fever are endemic there, and not to plague, which has occurred there in former years.

I noticed a report on the Health of T'eng-yueh by Dr. (?) Wihal Chand in the last issue of the Journal, and am very sorry that the name of such a man should appear in the Medical Journal. Both Chand and Sircar were only hospital dressers before coming into China and are not qualified men at all. They are low caste fellows, who will do any low trick for money, and I feel I ought to tell you what I know about them.

With best wishes for the New Year,

Yours,

W. T. CLARK.
REPORT ON THE HEALTH OF CHANGSHA FOR THE YEAR ENDING SEPTEMBER 30TH, 1909.

By E. H. Hume, M.D.

So far as can be judged from the reports of Customs and other surgeons health conditions in Changsha are certainly as good as in other ports along the Yangtze valley in Central China.

During the year under review only one case of serious illness occurred in the foreign community (numbering over 150, including Japanese). The patient was an American child of three years, who died after an illness of but twenty hours’ duration, with symptoms resembling those of ptomaine poisoning.

INFECTIOUS DISEASES.

1. Diphtheria.—In November, 1908, the local papers announced that diphtheria was breaking out in several parts of the city, and a little later it was specifically stated that a certain school was badly infected. Foreign physicians accordingly laid in an abundant supply of antitoxin, but only a very few cases were actually seen by them.

2. Mumps was prevalent in the city during April and May; schools especially being centres of infection. Three foreigners are known to have become infected here.

3. Measles and scarlet fever have also been quite prevalent, and fatalities have been chiefly due to the Chinese ignorance of the danger of exposure. Many cases of tuberculosis of the lungs have developed after measles.

4. Malaria.—As contrasted with the general prevalence of malaria in nearly every other port in Central China, Changsha is singularly free from malarial fevers. And, as might be assumed, the anopheles mosquito is practically never seen within the city. In three years I have seen only one specimen of anopheles within the walls. The reason for this singular freedom from malaria is to be made the subject of a special study during 1910.

In hospital work it may be almost taken for granted that a patient who comes in with malaria (true malarial fever being meant by the term “malaria”) has gotten his infection elsewhere. This was well
illustrated during the past week by the case of a soldier, who stated that he was a Changsha man by birth and training. He had been ill for twenty days, resident here all that time. True malarial parasites were found in his blood, and when questioned still more in detail, he acknowledged that he had been on duty at Yochow ten days previous to the beginning of his illness. This period would correspond to the period of incubation. The following table will give an idea as to the relative frequency of malarial infection of all types (including chronic splenic enlargement, etc.) in Changsha, in Ts'ing-kiang-pu, on the Grand Canal, and in a hospital chosen at random in Southern India.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Total number of new out-patients</th>
<th>Total number with malarial infection</th>
<th>Percentage of malaria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yale Hospital, Changsha</td>
<td>1,326</td>
<td>11</td>
<td>0.83</td>
</tr>
<tr>
<td>Ts'ing-kiang-pu Hospital</td>
<td>7,692</td>
<td>1,355</td>
<td>17.62</td>
</tr>
<tr>
<td>Vellore Women's Hospital (Southern India)</td>
<td>10,720</td>
<td>374</td>
<td>3.48</td>
</tr>
</tbody>
</table>

Hospital reports from other parts of Hunan, e.g., from Changteh, from Shenchow, from Yungchow, etc., show malarial fevers to be quite prevalent at these places. In the outlying districts, at a distance from the city of Changsha, anopheles mosquitoes and malaria are always present.

5. Typhoid Fever.—Hospital statistics in Changsha show a larger number of admissions as in-patients due to typhoid fever than to malarial fever. It is not long since medical men in many parts of China used to declare, as they did in India for many years, that typhoid fever was not to be seen among the natives. This was thoroughly disproved in India some years ago, and it is certainly ruled out of court as an opinion of value in China to-day. It is almost certain that the occasional cases of typhoid fever that one hears of among foreigners are due to infection from the Chinese.

PARASITIC INFECTION.

Purely aside from the cases of infection with the round worm, which occur commonly enough among both Chinese and foreigners, many cases are seen of illness due to infection with other parasites; one rather deadly and prevalent variety of parasite is the fluke known as Schistosomum japonicum. This has been found in Changsha and throughout the province and baffles ordinary methods of treatment.

Appended to this report is a meteorological table, kindly prepared for me by Mr. J. H. Nightingale, the harbor-master, to whom I am indebted for the trouble taken.
REPORT ON THE HEALTH OF CHUNGKING FOR THE YEAR ENDING 30TH SEPTEMBER, 1909.

By C. W. Freeman, M. D.

For the year ending September 30th the general health of the foreigners resident in the port of Chungking has been excellent. We have now in the port more than 200 foreigners, of whom 20 are young children. There has been no death nor any serious illness. The climate is a trying one. Owing to the proximity of the hills on the opposite side of the river 23 bungalows have been built and 4 more sites have been purchased. These bungalows are filled during the hot months, and some of the people make use of them for the weekends during the greater part of the year. There can be no doubt that without these the report would not be such a favorable one. The past summer has been a very cool one compared to that of the year previous. For the month of August frequent showers caused a break in the weather every few days. The only long continued heat was in September. As a result the foreigners stood the summer remarkably well.

Among the natives I see no difference from the preceding year. True this year we saw no cholera as we did in the year 1908. We were a little fearful lest earlier in the year than we can possibly get the infection from down river we might find some of the Chinese bringing out the disease from some of the old clothes of the previous years' victims, but we saw no cases at all. There is a great probability that our port will not be so free from this disease when we have the regular
arrivals of a steamer from the down river ports. Should cholera ever get a foothold in our crowded city in the early summer, before the cooler weather would assist in stopping its spread, the death rate would be very high indeed.

Tuberculosis is the prevailing disease. The number of the Chinese not having this disease is very small. The theory held by some "that in all men there are the germs of tuberculosis" might easily have some exponents in China. Certainly of the hospital surgical cases a great majority are this disease in some shape. Malaria comes next, rheumatism and dysentery in order from the hospital report. True this has left out of account the use of santonine. The use of this might be said to be only a matter of routine. All need it. Hookworm disease is seen and recognized in an increasing number. Some cases of fever are seen that are most puzzling. By examination they are not malaria nor typhoid nor apparently are they typhus, yet they are most difficult to get under control. Last year one case did give the Widal reaction.

Small-pox of course rages. Free vaccination has been offered here for the last 5 years, but except from apparently the educational standpoint it has not proven a great success. The numbers last year were fewer than the preceding year. However the Chinese are buying the vaccine themselves—some of the wealthier ones. The doctors buy it to some extent, to be certain of the pure disease to start their inoculation, I should think as the purchase is made in the beginning of their season and not repeated.

In the city many of the wealthy Chinese are building houses of foreign style of architecture. Some of these are 3-story high, and in these there is an example that is followed by some of the others by adding an additional story to their native house. This additional fresh air is a good thing. Some of the wealthier are purchasing milk and cod liver oil, and so the tubercular condition is being met partly at least.

During the year I had my first case of stone-in-the-bladder. This is very rare in this part.

Chungking has quite a trade in skins and hides, but as yet I have heard of no case of anthrax.

The number of cases treated in one of the hospitals for the breaking of the opium habit was 61. There does not seem to be any increased number of these cases coming to us over the previous years.

The following meteorological observations have been kindly supplied by the Harbour Master, Mr. F. G. Beeke.
Quacks in Japan.

Medical advertising is frowned upon by the profession in Europe and America generally. Beyond a modest sign bearing name and degree, or perhaps an equally simple card in a newspaper, it is usually held to indicate that he who indulges in it is a charlatan. In Japan, we are told by an editorial writer in The Hospital (London, September 11), the government has recently found it necessary to legislate against medical advertising. With the adoption of the Western therapeutics, in which the Japanese have gone far toward excelling their instructors, they have also been invaded, the writer tells us, by "less desirable products of Western therapeutic enterprise, including the advertising quack, the patent medicine, the cure-all nostrum, and other devices by which the ignorant and the credulous have so long been bled by ingenious knaves in Europe and Great Britain." We read:

"It would appear that the dimensions of these evils have grown to such an extent that the government of the Mikado, with a praiseworthy concern for the welfare of his subjects, has taken at least the

<table>
<thead>
<tr>
<th>MONTH</th>
<th>BAROMETER.</th>
<th>THERMOMETER.</th>
<th>RAINFALL.</th>
<th>RIVER.</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>29.607</td>
<td>29.030</td>
<td>53</td>
<td>54</td>
</tr>
<tr>
<td>November</td>
<td>29.815</td>
<td>29.201</td>
<td>69</td>
<td>48</td>
</tr>
<tr>
<td>December</td>
<td>29.689</td>
<td>29.292</td>
<td>53</td>
<td>40</td>
</tr>
<tr>
<td>January</td>
<td>29.810</td>
<td>29.247</td>
<td>59</td>
<td>39</td>
</tr>
<tr>
<td>February</td>
<td>29.924</td>
<td>29.212</td>
<td>64</td>
<td>39</td>
</tr>
<tr>
<td>March</td>
<td>29.890</td>
<td>29.032</td>
<td>72</td>
<td>48</td>
</tr>
<tr>
<td>April</td>
<td>29.768</td>
<td>29.026</td>
<td>62</td>
<td>54</td>
</tr>
<tr>
<td>May</td>
<td>29.857</td>
<td>29.130</td>
<td>92</td>
<td>57</td>
</tr>
<tr>
<td>June</td>
<td>29.285</td>
<td>29.819</td>
<td>98</td>
<td>68</td>
</tr>
<tr>
<td>July</td>
<td>29.677</td>
<td>28.819</td>
<td>105</td>
<td>70</td>
</tr>
<tr>
<td>August</td>
<td>29.354</td>
<td>28.922</td>
<td>99</td>
<td>70</td>
</tr>
<tr>
<td>September</td>
<td>29.468</td>
<td>29.004</td>
<td>104</td>
<td>64</td>
</tr>
</tbody>
</table>

*below zero.
preliminary steps toward the regulation of a part of the evil. We do not gather that so far anything is being undertaken on the lines of the excellent New Zealand legislation against quack advertisements and lying nostrum-vendors; but, according to an ordinance recently published by the Home Department, very stringent rules are to be enforced with regard to the conduct of the medical profession. It is further to be observed that in respect of what shall in the future, and what shall not, be conduct befitting a Japanese doctor, the model which the regulations follow is in the main that set by the General Medical Council of Great Britain. In future no licensed medical practitioner will be permitted to advertise in Japan details of methods of medical treatment, or the history or success of such methods. Doctors and dentists connected with hospitals or engaging in general practice will not be allowed to advertise any information beyond that indicating their degrees and specialties. In this respect the ordinance approximates perhaps more to the American idea of what is legitimate, for it is quite common to find in transatlantic journals small rectangular spaces containing the name, address, and telephone-number of some practitioner, with an indication of the branch or branches of work in which he claims to be especially adept and instructed.

"But, after all, in regulating the extent to which qualified men may bring to public notice the fact that the State recognizes their special claims to be regarded as trustworthy practitioners of medicine or surgery, the Home Department is dealing with the fringe only of a very large evil. It is something that a start should be made, but to command anything like complete success the much greater question of fraudulent cures and the immorality with which they are advertised in the lay press must be dealt with. To lay down rules for the guidance of the medical profession is much less essential than to protect the public from the unscrupulous and unqualified impostors who bolster the sales of their cure-alls by wanton lies. The Japanese government is to be congratulated if it has decided to take steps toward the remedy of these evils, and it might well be recommended to study the penalties enacted in New Zealand not only against those who concoct quack nostrums and advertise them with false statements, but also against those who publish them without taking reasonable steps to assure themselves of the genuineness of the advertisements and the reputations of the advertisers."
The China Medical Journal.

Vol. XXIV. MAY, 1910. No. 3.

The yearly subscription to the China Medical Missionary Association is $1 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.

The recent uprising in Hunan, together with the local disturbances in other parts of China, make the outlook for peace and prosperity in the Empire in 1910 anything but promising. The pitiful part of it all is, that it indicates that the old spirits of prejudice and hatred, among those who ought to be the leaders to better things, are not dead, but have only been dormant.

The awful lesson of 1900 has been forgotten, and the government will perhaps have to learn again the bitterness of indemnity and armed intervention; and will, as usual, lay it at the door of the foreigner and not to their own sins of pride, avarice and peculation. How much loss of time and resources it has caused and how much it has delayed the spiritual and material uplift of China God alone can know.

Our heartfelt sympathy goes out to the brethren in Hunan who have labored so faithfully and then, in the short period of a few days, "watched sloth and heathen folly bring all their hopes to nought." The hearts of those who were at the Hankow Conference have certainly been with Hume and Logan and Keller in these trying weeks. The worst feature of the present disturbances seems to be the utter incompetence of the government officials to suppress or prevent these explosions and that instead of being stronger the central government really seems weaker than a few years ago.

Later news reports that the Mission Hospitals and the Yale Mission have been unmolested. Whether this has been due to
some fleeting spark of common sense left in the authorities at Changsha, or to the importunity of neighbors, has not yet appeared. It is practically the only bright spot in a very dark page of Chinese history.

In a recent letter Dr. Jefferys reports himself as improving, though still in the hospital at Easter time. He writes in good spirits and says he intends for the present to devote his entire energy to recovering health.

Death of Dr. J. A. Otte,

Yungchun, April 21st, 1910.

To the Editor of the
“China Medical Journal.”

Dear Sir: The China Medical Missionary Association has once again suffered a serious loss. Dr. Otte, of Amoy, passed to his reward on the evening of the 14th of April. Other pens will doubtless write of his life and work, but as one of those who were privileged to know him on terms of the most intimate friendship, I cannot resist adding my testimony to theirs. We have lost an able man, a first class surgeon, an architect and engineer of no mean ability, and above all a devoted servant of our Lord Jesus Christ. Few men in the mission field have so won the love and confidence of the Chinese, to whom his death is comparable to the loss of a trusted friend. As to the personal loss sustained by some of us, I cannot trust myself to write.

I am, yours faithfully,

J. Preston Maxwell.

Resolution on Doctor Cawas Lalcaca,

We, the members of the Medical Missionary Association of Shanghai, having heard of the death of Doctor Lalcaca, offer the following resolution:—

Resolved, That we have learned, to our great sorrow, of the sad death of our fellow-member, Doctor Cawas Lalcaca, that we fully appreciate the noble self-sacrifice he made in his attempt to save life. That he was a true friend, a faithful and zealous member of this society, a careful and conscientious physician and a man who had the respect and esteem of all who knew him.

We beg to offer our sincere sympathy to his bereaved family, and we desire that this resolution be recorded by the secretary upon the minute book of this society.

Shanghai, 19th January, 1910.
Book Reviews.

The Journal has just received from the well-known house of P. Blakiston's Son & Co., Philadelphia, several new books which deserve more than a passing notice. Three of them are in what is known as The Leather Bound Series of Medical Manuals: an Emergency Surgery, by John W. Sluss, professor of Anatomy in the University of Indiana; and an Operative Surgery, Vol. II., dealing with the surgery of the vascular system, bones, joints; and Amputations, by John F. Binnie, A. M. C. M. (Aberdeen), professor of Surgery in the State University of Kansas. These will be reviewed later.

Medical Diagnosis, by Dr. Charles Lyman Greene, professor of Medicine in the University of Minnesota, is the work of a teacher and a clinician. Dr. Greene is the worthy son of an illustrious father, the late Dr. William Warren Greene, at the time of his death professor of Surgery in Medical School of Maine and one of the most brilliant operators of his day, thirty years ago. Dr. Greene has evidently inherited his father's love for the profession, though it has led him into another branch of it. One of his recent students describes him as a man who "knows his subject thoroughly" and that "it is a pleasure to see him examine a patient." It is certainly a pleasure to read his book. Without attempting to make it too full the outlines of diagnosis leave nothing to be desired and the directions for laboratory examinations of various kinds would do credit to a more extensive work; all the necessary tests are taken up with clearness and brevity. The arrangement of the subject matter is natural and logical.

The books are models of the printers' art; with marginal indicators, well chosen cuts, colored plates, and diagrams, are both convenient and attractive. They are designed to be clear, compact and comprehensive books of reference for the student and the busy practitioner and should indeed be popular among those for whom they have been prepared.


The author's aim is stated to be to present a concise account of the anatomical facts of importance to the surgeon, indicating the relative importance of these facts to brief references to the surgical
bearing. It is based on British and Continental standards of teaching, but modified considerably by the author's own mature experience.

The divisions of the book are about according to rule and the illustrations, though few are exceedingly clear and well produced. The section on herniae is perhaps that of greatest interest. The best recommendation of the book and a very important one is that it treats an acknowledged and providedly dry subject in decidedly the most readable manner of any small, condensed work yet produced. Compared with Treves' Applied Anatomy, excellent as is the pabulum of that work, the book under review is far more readable, and to a student self-explanatory. It would translate well into Chinese and is worth the Publication Committee's consideration. Z.

AIDS TO MICROSCOPIC DIAGNOSIS OF BACTERIOLOGIC AND PARASITIC DISEASE.

The object of this handbook is stated as intended to supply those preparing for examinations with a work for revision purposes—a convenient size to carry about. We confess to having, in our student days, made profitable use of a large number of such manuals and by that means whiled away the tedious and otherwise unprofitable hours of tramcar rides and suburban train journeys. And we have no doubt of having by their aid contributed to a satisfactory if not brilliant graduation. As such it is admirably arranged, and the material is well selected for modern examination requirements. As a book for the general practitioner, however, not to speak of the specialist student, it is not serviceable as compared with recent works by Daniels, Stitt, and others.

Z.

We have received from the Publication Committee a copy of Nursing: Its Principles and Practice, for Hospital and Private Use, by Isabelle Hampton Robb. Translated by Eleanor Chesnut, M.D., and Ruth Bliss Boggs, M.D. Published in Chinese style. The volume includes all but the last fifty pages, which will be out by Christmas time. It is issued as a memorial to Dr. Eleanor Chesnut, who began the translation. Of course its terminology is up-to-date, and it has the imprimatur of the Medical Missionary Association.
Nurses' Department.

TO THE MEMBERS OF THE NURSES' ASSOCIATION.

In accordance with the instruction of those present at our first meeting at Kuling, and in anticipation of hearty cooperation of those who had expressed their desire that we, the nurses of China, should avail ourselves of the offer of the Editor of the Journal, your Executive Committee has undertaken a page of the Journal to be called "The Nurses' Department."

If the support given warrant it, more space will be available. This can be made a valuable opportunity to us if each one does her part in sending in material. This material should be drawn from our problems and our solution of them; the plans for hospital and training school, their failure and their success; the methods of evangelical work in ward and clinic and report of cases.

As the nurse's work differs from the physician's yet has its distinct and valuable place, so the nurse's viewpoint is distinct and valuable, and we may be mutually most helpful if each does her best. And as we speak of cases we remember that our work is under the Great Physician, who came to make us whole, for those we serve in Christ, not body nor soul nor spirit but "body, soul and spirit all we yield to Thee," yield in consecrated service, in prayer and effort to restore.

We need to know what methods and devices ingenuity is using to overcome deficiencies of hospital equipment, to increase the comfort and safeguard the lives of patients; the method of instructing pupil nurses and what is being done to raise the ideal of service and to inspire these young women to work with single motive, "not with eyeservice as men pleasers, but in singleness of heart fearing God." What is the plan of teaching in ward and clinic, how best to prepare the hearts of the patients for the Gospel seed, to protect from the road-side trampling, to clear out stone and thorn that the ground may be redeemed for the good seed, and how to watch over the sown seed.

Until the new editorial secretary can be appointed next year your secretary will be glad to receive and edit contributions and questions.

THE JOURNAL AND THE NURSES.

The following extract from a letter of Dr. Jefferys is for all of us:—

"I infer that if the Nurses' Association expects to publish material regularly in the Medical Journal the members will more or less subscribe to the Journal. Otherwise the thing would lose its point. I think that considering the fact that nurses are not members of the China Medical Missionary Association and have to pay $1.00 dues to their own Association, it would be possible to arrange that they receive the Journal at a lower figure than the doctors.

The $4.00 paid by the doctors includes membership and the Journal, and I think the nurses could probably have the Journal for $3.00—that is, the difference between their dues and $4.00—provided a sufficient number of them were ready to subscribe, say twenty-five."

Cordially yours,

W. H. Jefferys
Miss Katharine de Witt, one of the editors of The American Journal of Nursing, writes:—

I have watched events among missionary nurses there (in China) with great interest, and have wished we might somehow be of service to you. Our pages are always open to you, but it is well you have so cordial a magazine as the CHINA MEDICAL JOURNAL at hand. I enjoy that magazine very much; it is always so alive and interesting and practical. . . . I am anxious to get nurses in this country more in touch with missionary work; they know, as a rule, so little about it. I wish we could get the nurses at home on furlough to give talks in our training schools and to our Associations.

[What can be done in regard to this last suggestion?]

Branch Reports.

SOUTH CHINA BRANCH.

The last regular meeting of the South China Branch of the China Medical Missionary Association was held April the sixth. Sixteen members of the twenty-eight enrolled were present. These included ladies and gentlemen from both Kwong-tung and Kwong-sai. Reports were given from the meetings of the China Medical Association, held in Hankow in February, and from the Far Eastern Association of Tropical Medicine, held in Manila.

At this meeting a new feature was introduced; instead of but one session there were two, one of which was for clinics only. Three interesting cases were shown, examined and discussed. One case was reported—vesical bifurcation with calculus. All led to profitable discussion.

The society is grappling with the question of a union medical school for men. As there are ten resident men physicians in Canton, these are a nucleus for an excellent start for a faculty.

As soon as they themselves can be united there is no doubt they can easily unite the native schools fast springing up. There are six schools for men now in Canton.

Another thing the society is undertaking is local research work. All the doctors, with perhaps one exception, are extremely busy, having either hospitals, medical lectures or translating of medical books. This leaves little time for quiet research.

Our president, Dr. John Kirk, although only out three years, has a flourishing hospital of thirty constantly filled beds in a district hitherto unfriendly. By his gentle forbearance, successful operating, he and Mrs. Kirk are fast winning the hearts of the people. So much so that next to the filthiest place in the town they have permitted Dr. Kirk to erect a small house!

Not a foot elsewhere is available.

"There is certainly no such field for evangelistic work as the wards of a hospital in the land of China."

The next meeting will probably be held at Long Island, a summer resort, a few miles from Hongkong. Any doctors at this port at the time of the meeting—middle of August—will be heartily welcome.

MARY H. FULTON, Secretary.

CANTON, April 12th, 1910.
Medical Progress.—Pathogenesis of Typhoid.

The Pathogenesis of Typhoid Fever.

Under the charge of Edward H. Hume, M.D.

It is probable that since the identification of the B. typhosus by Eberth, Koch, and Gaffky, no single advance in our knowledge of typhoid fever can equal that which was made when it was discovered that probably four per cent. of the cases remain after their illness—"bacillus-carriers." This fact, which has been abundantly confirmed from many parts of the world, has made it possible to proceed in epidemiologic investigation with a definiteness impossible before.

But while this observation regarding the spread of the disease is of incalculable practical importance, recent studies concerning the pathogenesis of typhoid fever are undoubtedly of equal if not of greater lasting significance as regards our knowledge of the ultimate nature of the disease. For after all it is only as our conceptions of any ailment include a clear picture of the nature of the inciting cause, of its effect on the human organism, pathologically, chemically, and symptomatically, that we view it with any sense of understanding it, and treat it with anything more than arbitrary empiricism, following in the footsteps of those who went before us.

For those who work in the tropics, the clear picture of the symptomatology of typhoid fever, given by Leonard Rogers in his recently published book, "Fever in the Tropics," gives an orderly understanding that is most helpful on the one hand and most stimulating to original observation on the other, as to the variations which are to be met with in this or that section of the East.

The chemistry of typhoid fever is a subject on which but little has yet been published. The work of Coleman and Buxton on the pathogenesis of the disease is the special phase of the subject to which I wish to direct attention here. As outlined in the CHINA MEDICAL JOURNAL (1908, Vol. XXII, page 1) these workers presented in 1907 a hypothesis as to the nature of the typhoid infection which seemed more suggestive, more in line with our daily observations of the clinical course of the disease and more definitely in accord with laboratory studies on animal infection with the B. typhosus than any that had previously been advanced. Their theory depends upon what is now established fact, namely, that the B. typhosus produces its evil effects only after disintegration within the organism; in other words, it produces symptoms of the disease by the liberation of an endotoxin, which liberation is not possible until after the destruction of the bacillus itself. It becomes obvious at once that if they are right, there can be no antitoxin treatment for the disease such as is possible for diphtheria. This probably also explains why no other workers are able to get such results with the use of an anti-typhoid serum as are reported by Chantemesse (see C. M. J., 1908, XXII, page 11). The body's best defence against invading bacilli and other microorganisms has lain in its power to produce bacteriolysis. In the case of typhoid, however, it seems as if
this very destruction of bacilli was the thing that liberated the endotoxins which caused the symptoms of the disease. In their most recent contribution (Journal of Medical Research, 1909, XXI, 83, reviewed editorially in the Journal of the A. M. A., 1909, LIII, 1,292) Coleman and Buxton illustrate their theory very vividly. If a large dose of typhoid bacilli be injected into an animal already immunized against this organism, it is possible that this animal may die sooner than another animal, not immunized, to which a similarly large injection of typhoid bacilli is given. In the former case the animal reacts to the injection by destroying large numbers of the injected bacilli, and thus pouring out into its own system a huge dose of endotoxin far greater than it is able to bear. The second animal, not so immunized, receives the quantity of bacilli, and though prostrated by their number and rendered ill, still, because it does not possess the power to destroy the bacilli and thus pour a large dose of the liberated endotoxin into its own system, it continues to live longer than the immunized animal. Search may reveal not a single bacillus in the circulating blood of the animal that died first, the immunized one; and on the other hand, the blood of the non-immunized animal may be swarming with bacilli. Yet the latter animal will have the chance of living longer than the former one.

Coleman and Buxton believe that typhoid bacilli enter the general lymphatic system through the lymphatics of the intestinal wall. In the lymphatic system and in the spleen they are, to a certain extent, safe from the bactericidal power of the blood. While they are thus in a measure concealed, there is in progress what we clinically would call the period of incubation. When the bacilli have reached a sufficient number, they are poured out into the blood, are destroyed there by its bactericidal power, the endotoxins of the disease are liberated and typhoid fever is ushered in. The multiplication of bacilli occurs, not in the blood, but away from it. The blood destroys them. Hence typhoid fever is not to be considered as a septicemia, but as a bactere mia. Liberation of bacilli in the tissue does not produce the symptoms of the disease; this results only when numerous bacilli are destroyed in the blood stream. Clinical evidence of this position is not wanting in the experience of any who see many cases of the disease, especially if their surgical work is followed up bacteriologically. Not a few cases are on record of the discovery of typhoid bacilli in bone abscesses and in lesions of other organs without the presence of the clinical disease, either synchronously or previously. So also the isolation of typhoid bacilli from the stools of normal human beings, as for example, from the stools of attendants and nurses in hospital wards, proves that the bacillus may be present in the system without really having secured effective entry to the only place where it can be really attacked and destroyed and its endotoxin set free.

To continue, Coleman and Buxton believe that when immunizing processes have reached a certain stage, bacilli cease to be poured out from the lymphatic tissues into the blood, and the fever accordingly subsides. In some cases an irregular temperature persists, and this is to be explained by the irregular discharge of bacilli into the blood from some lymphatic organ where they have continued to grow. Relapses may be accounted for in this
Correspondence.

The spleen is not infrequently seen to remain large even after the subsidence of fever, and it may well be that infection remains concealed therein, ready to flare up when immunity diminishes. Systemic and local immunity to the typhoid bacillus are seen to vary also, for after the subsidence of the fever, it is quite common to see what are called the post-typhoidal sequelae, such as cholecystitis, etc.

It is difficult in the face of the evidence brought forward by these workers as to the strong bactericidal power of the blood, even in typhoid, to accept the other theory which regards typhoid fever as a septicemia, for in the latter case it would be necessary to regard the bacilli as continuing to multiply in the blood. Coleman and Buxton bring forward as one of the further proofs of their position the analogy of the paratyphoid bacillus, which constantly produces clinical gastroenteritis, and only occasionally, when it has succeeded in invading the lymphatic system, gives the clinical picture which so nearly corresponds with typhoid fever.

Having reached this stage in their study, it remains to be seen whether further investigation will enable these workers to produce in the animal organism any sort of an anti-endotoxin, which shall work side by side with an agent that shall increase, or at least prevent the decrease of the bactericidal power of the blood.

Correspondence.

The New York Post-Graduate Medical School is establishing in its new buildings a full equipment of wards and laboratories for the teaching of tropical medicine. The department is being conducted under the cooperation of the U. S. Army, Navy, and Public Health Services, who detail officers from their respective medical corps to assist in the conduct of the laboratory and clinical courses.
PERSONAL RECORD.

BIRTH.
At Kaifeng, 20th March, to Dr. G. W. and Mrs. Guinness, C.I. M., a daughter.

MARRIAGE.
At Foochow, 25th of February, Walter W. Williams, M.D., and Miss Grace B. Travis, both of the M. E. M.

DEATHS.
At Amoy, April 14th, J. A. Otte, M.D., Reformed Church of America, of pneumonic plague.
At Weihsien, 19th April, Carolyn, the beloved daughter of Dr. and Mrs. Charles K. Roys, A.P.M., aged 1 year and 5 months. Measles, complicated by pneumonia.

ARRIVALS.
March 4th, Dr. P. S. Evans and family, A. B. M., South, Yangchiow, returning; Dr. W. F. Seymour and family, A.P. M., Tungchow, Shantung, returning.
March 21st, Dr. Sue M. Koons, M.E.M., Fukien, returning.
April 18th, Dr. and Mrs. Morley and child, from England, returning to Teian, Hupchi, W. M. S.

DEPARTURES.
March 22nd, Dr. W. E. Macklin and family, F. C. M., for U. S. A.
April 2nd, Dr. H. L. Canwright and family, M. E. M., and Dr. C. E. Tompkins and wife, A.B.M.U., from Szechuen, for U. S. A.
April 22nd, Dr. A. Davidson and family, Friends Mission, Chungking, for England.

WANT DEPARTMENT.

[It is hoped this new departure will approve itself to the Association. Subscribers are invited to send short notices of personal, missionary and professional “wants,” free of charge. Such notices will be kept in for a reasonable time or until withdrawn.—Editor.]

SNAKES.—Dr. A. Stanley, Health Officer, Shanghai, wants snakes of China, 70% spirits. Will pay transportation.

PARAGONIUM WESTERMANNI.—Dr. H. B. Ward, University of Ill., U. S. A., desires specimens of this lung fluke.