

SUPPLEMENT TO
"THE INDIAN MEDICAL GAZETTE."

MARCH, 1909.

MEDICAL CONGRESS, BOMBAY.

THE BOMBAY MEDICAL CONGRESS, 22ND
TO 24TH FEBRUARY 1909.

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drier.
The Editor, "*Indian Medical Record*," Calcutta.
Charles W. White, Esquire.
Charles F. Stevens, Esquire.

The work was divided into six sections, viz. :—

- (1) On Cholera, Dysentery, Enteric fever and Tropical diarrhoeas ;
- (2) On Malarial fever, relapsing fever and Leishman-Donovan body Infection ;
- (3) Animal parasites, snake venoms, beri-beri, leprosy, elephantiasis, etc. ;
- (4) Sanitation including disposal of sewage, water supplies, Disinfection, Marine hygiene ;
- (5) Surgical, especially ophthalmic surgery, vesical and renal calculi and tropical surgery generally.

The (6th) next section was the Exhibition which was a marked feature of the meeting, it was held at the Oval and was largely attended.

THE MEDICAL CONGRESS AT BOMBAY.

GENERAL IMPRESSIONS.

"A great success," "a most successful meeting," "everything well done : " such were the opinions formed and heard on all sides.

The Medical Congress at Bombay from the 22nd to the 26th February is an accomplished fact and a pronounced success. This was evident from the very first. The arrangements were

excellent, the surroundings admirable and the numbers very large and keen. The **Opening Ceremony** went off very well in the great Convocation Hall of the Bombay University. The new Surgeon-General, in an excellent speech, gave a history of the inception of the scheme and the way it has been carried out. Following on SURGEON-GENERAL STEVENSON'S speech, H. E. the Governor of Bombay read an admirable and lucid review of medical progress and then presented medal memorials of the Congress to Prof. Ronald Ross, Dr. Shiga, Dr. Musgrave and the other foreign delegates from Sumatra and the Philippines. The opening ceremony resolved itself into Section II and SURGEON-GENERAL H. HAMILTON, C.B., presided.

The distribution of work was well arranged into sections and each section had a fine room in the Convocation Hall and the large University Library for its meetings.

On the first day the subjects in each section were as follows :—Section I, Cholera and Vaccination ; in Section II, Malaria Prevention ; Section III, Tsetse Flies and other Animal Parasites, Section IV, Sanitation ; Section V, Surgery in the Tropics. On the second day dysentery in jails and the bacteriology and treatment of dysentery occupied Section I both morning and afternoon. In Section II, a lively discussion on plague occupied all day. In Section III, the papers by Lamb and Wall and one read for Sir Lauder Brunton attracted large numbers, and at the **Conversazione** in the Exhibition grounds at night MAJOR WALL'S lantern demonstrations of snakes attracted a huge crowd.

The third day was devoted to enteric fever and hill diarrhoea in Section I, to Leishman-Donovan infection, and especially Major Donovan's paper in Section II. Beri-beri and especially leprosy and its treatment by Nastin occupied Section III. Sewage disposal was the subject of Section IV, and various surgical subjects attracted large crowds to Section V.

One heard the remark on all sides that one would like to be able to be in two or more places at once. The work was well distributed, but still one might well wish to attend a discussion on litholapaxy in Section V and at the same time on plague in Section I.

Not being able to be, like Sir Boyle Roche's bird, in two places at once, we can only describe what we actually saw.

On the first day the two great subjects were **Malaria and Cataract**. MAJOR RONALD ROSS' paper we quote from below. His main point was that we have had enough of inquiries and the time had come to act. His suggestions were based upon his recent experience in the Mauritius. His paper was followed by one by MAJOR S. P. JAMES, I.M.S., which gave a history of the attempts to follow Major Ross' instructions in the **Anti-Malarial Campaign of Mian Mir** and its unfortunate and complete failure to achieve any good results in spite of having turned Mian

Mir into a dry desert. There was a considerable amount of heat and even personal warmth in the discussion which followed these papers and that by CAPT. CHRISTOPHERS and DR. BENTLEY on the human factor in Malaria Epidemiology, and it was quite clearly stated that failures in attempts to stamp out malaria are not as well advertised as the immediate results of such campaigns, and this echoed a general feeling that it is not enough to start a scheme: we must report about the results two or three years afterwards. It was also shown that the Panama successes have been purchased at a prohibitive cost, about £10 per head of the population per annum. The discussion will do good and the warmth imported into it is excused by the earnestness of the speakers. We still think that though his methods have been fiercely attacked, Major Ronald Ross came well out of the encounter, and we hope his visit will result in a combined attack on malaria, "such as late o'er the pale 'Punjab' passed," and we entirely agree with him that the time for action has long arrived. Our views as to the particular methods may differ, but the necessity for an attack with all methods is imperative.

One point, however, must not be lost sight of, and that is the comparatively petty scale on which those anti-malarial operations reported successful have been done, Port Sweetenham, Ismalia, Mauritius or even Panama are small affairs after all; and the number of people involved are not greater than those on a few big tea gardens or in a Mofussal town; but where are our tea gardens or small towns to get the money to do things *a la* Panama? The remedy for India must be cheap as well as effective and we have that in **Quinine**.

The other great feature of the first day's debate was in the **Surgical Section** and may be said to be an apotheosis of "Jullundar Smith" as he must allow us to call him. It was the battle of the capsule over again, with the same protagonists as have taken part in the discussion in the pages of the *Indian Medical Gazette*, with the notable exceptions that Herbert, Maynard and Elliot were unfortunately not present. Drs. Wanless, Neve, and Rutter-Williamson were there and took part in the debate. MAJOR SMITH had marshalled his forces well; he read no paper himself on this subject, but took part in the discussion. The important papers were those by CAPT. W. E. MCKECHNIE, I.M.S., and CAPT. A. E. J. LISTER, I.M.S., both of whom have studied the subject for several years past in **Smith's Clinique**. McKechnie's paper which we have quoted from below introduced the subject well, and special attention was given to Lister's very valuable report of an examination of 100 cases of Smith's operation where vitreous had escaped. The general feeling was that no one liked **Vitreous escape**, but that its results immediate and remote were not so bad as is generally thought. We commend these valuable papers to our readers. Other papers on the same subject by

DR. JAMISON, a beginner, who studied in Smith's Clinique and by CAPT. H. GIDNEY, I.M.S., who derives his experience from Assam and Eastern Bengal were also read.

The discussion was animated if one-sided, DR. WANLESS, NEVE and RUTTER-WILLIAMSON declared with reservations for the Jullundar operation. MAJOR P. P. KILKELLY, I.M.S., who has succeeded Lt.-Col. Herbert in the chair of ophthalmology at Bombay, held an open mind on the question. He had tried it in over 500 cases and was not satisfied that better results could be got by it than with other methods.

The discussion lasted for a considerable time and there were also read good papers by Capt. Oxley, by Hospl.-Assistant Mathra Das and by Asst.-Surgeon Kidarnath Bhandari, both of whom advocated and practised the **Jullunder operation**. Many speakers too were evidently influenced by the overpowering strength of the Jullundar party and there was too much talk of the "old school" and the "new school," which we think is begging the question. One remark made by Major Smith himself (and we have asked others if we heard him aright) was that the reason why cataract is not so common down country as it is in the dry arid Punjab, etc., is that the *rawal* or "coucher" has been ousted out of the Punjab by the brilliance of ophthalmic surgery there, whereas, in the more benighted parts, fewer operations are done in the public hospitals because the "coucher" is still well able to hold his own as regards results. Such a statement can only be called a *jugement saugrenu*. It is a pity that the attention of medical men have not more been directed to the **Etiology and causation of cataract**, a subject of really much greater importance than the question as to which of many good methods is the best. There are at least two factors which differentiate Bengal and Burma from the drier and hotter parts of India as regards cataract and these are the probably the higher standard of nutrition, the more humid atmosphere and the infinitely less degree of glare. It is a pity that no one has taken up the subject of the etiology and causation of cataract. It is, after all, of greater importance than the precise method to be used in cure, for, after all, there are very many ways of doing cataract successfully, and though the result of the present discussion will be to spread the fame of the Jullundar Method still it should not be forgotten that there are other extremely good methods. At any rate, the meeting was a veritable triumph for Major Smith and his clinique at Jullundar and the pity was that it did not happen that more men who used the capsulotomy operation were able to be present.

On the second day there was an interesting discussion on the papers read by CAPT. GORDON TUCKER, I.M.S., on **Appendicostomy** for chronic ulceration of the colon and on **Dysentery** as seen in Jails by LT.-COL. W. J. BUCHANAN and CAPT. W. H. E. FORSTER, in which Dr. Von

Langhem of Sumatra, Capt. Greig, Major L. Rogers, Col. Forman, Major Heard and others took part.

The great feature, however, of the second day's work was the **discussion on plague**. We have quoted from many of the papers below. The discussion was lively and was taken part in by CAPT. GLEN LISTON, MAJOR LAMB, MAJOR STANDAGE, CAPT. GORDON-TUCKER, MR. RAMACHANDRIER, MAJOR CLEMESHA and DR. J. TURNER, whose somewhat heated expression—"rats, rats, rats" in a way unconsciously summed up the whole matter in a sense apparently not intended.

We were not present for the whole of this interesting and prolonged debate, but we were fortunate enough to hear LT.-COL. ANDREW BUCHANAN'S **Advocacy on the cat** as the most acceptable method of combating plague. We quote from this paper below and the author's views are to be found at length in a little pamphlet just published which we recommend to our readers.* Lt.-Col. Andrew Buchanan had his audience with him from the start, and his racy and spirited address took the meeting by storm. It was witty as well as wise, and the way in which he singled out representative Parsis, Hindus and Mahomedans in the audience and pinned them down by quotations from their own scriptures as to the keeping of cats was thoroughly appreciated by the large audience. His facts as to the absence of plague, where people kept cats, even one for every two houses, were remarkable and he scored heavily when he read out a letter from Prof. Kitesato, showing that the one city in Japan in which plague could not keep a footing was where a "cat census" showed a large number of cats and his dramatic appeal to DR. SHIGA who sat close by and who confirmed the statement was thoroughly appreciated by the audience. Conversation with many men after the meeting had closed convinced us that very many were coming round to Col. A. Buchanan's view that the cat is the natural enemy of the plague rat, that it does not itself become infected with true plague, and that it is one measure of plague prevention, dictated by their scriptures to Mahomedan and Hindu alike, and which will therefore be acceptable to all.

We certainly agree that more attention should be paid to this simple method of prevention. The failure of cats in Jails and elsewhere to kill rats is because they are too well-fed. The village cat is not too well-fed, and gladly attacks its enemy the rat.

Many other points of interest in this plague discussion we were not able to hear and consequently cannot here reproduce.

The third day's work was devoted to a discussion on **Enteric fever**, based on the paper by Lt.-Col. SEMPLE, of the Kasauli Central Research Institute. The discussion on **Beri-beri** and

Leprosy in Section III consisted of no less than four papers on the **Treatment of Leprosy by Nastin**, and certainly the numerous photographs of cases so treated showed results which are certainly encouraging. The Surgical section had a good discussion on litholapaxy and several excellent papers on surgical subjects were read.

There were many excellent papers read too on **Sanitary Organization** for India by DR. TURNER, MAJOR CORNWALL, and others, which specially dealt with Bombay. The paper by DR. CLEWOW on the Haj and the **need for Quarantine** before departure of pilgrims has been taken up and discussed by the local press. We are not convinced of the necessity for an alteration of the present arrangements.

THE EXHIBITION.

One great and interesting feature of the meeting was the Exhibition, and of the exhibition the **Pathological Section** was far the most important. It is not too much to say that the Pathological Exhibition was the greatest feature of the Congress, and was in itself not only an epitome but was a demonstration of the enormous amount of first rate research work now being done all over India. The success of this exhibition is due to Capt. Cunningham, I.M.S.

It was held on a large tent in the grounds of the larger exhibition and it consisted of microscopic and macroscopic specimens illustrating various diseases and parasites. The following is a list of the most interesting of the exhibits shown—Specimens showing the various stages of the malarial parasites, shown by the Bombay Laboratory, Lt.-Col. Adie, I.M.S., of Ferozepore, Major L. Rogers, I.M.S., of Calcutta, Dr. Powell and Capt. Wells, I.M.S., Bombay. Other specimens were Zygotes in infected mosquitoes, and mosquitoes and their larvæ shown by Mr. F. M. Howlett, of Pusa. Specimens also of monkey malaria were shown by Capt. E. D. W. Greig, I.M.S.

Various stages of the Leishman-Donovan body were shown by Rogers and much interest attached to Dr. Rao's original work showing the cultural stages of the parasite of Delhi Boil. Good specimens illustrating sleeping-sickness were shown by Greig, and a very interesting collection of trypanosomes, human and animal, by Adie, Greig, Capt. Holmes, A.V.D., and Mr. Sowerby. Spleen smears of blackwater fever were shown by Christophers, and a very fine collection of specimens of various spirochaetes were exhibited by Capt. Mackie, Lt.-Col. Adie, Capt. Markham Carter and Dr. Powell. The mycetoma specimens of Dr. Gibson, Dr. Surveyor, the Agra School, and Capt. F. P. Connor from Calcutta, were very good. The effects of Nastin treatment of leprosy were well illustrated by numerous photographs. The Negri bodies found in rabies cases were shown by Major Cornwall, I.M.S., and Fleas and plague rats by Capt. Liston and Capt. Lloyd.

* Pioneer Press.

The cultural appearances of the various bacilli causing dysentery were shown by Capt. Greig and Capt. Wells, I.M.S. Dr. Powell sent his collection of parasitic worms, snakes were shown by the Bombay Natural History Society and a fine collection of calculi were shown by the Grant Medical College. The collection of flies and blood-sucking insects was very complete.

It was universally agreed that the Pathological Exhibition was a great success, and one of the best features of this great Congress.

A SUMMING UP.

We have already said that the whole meeting was a great success. It was admirably organised and arranged. The arrangements for visitors were excellent, and the hospitality of the medical men of Bombay was unstinted and abundant. The thanks of all are due to LT.-COL. W. E. JENNINGS, I.M.S., the Secretary, and to his Assistant Secretary, CAPT. GORDON-TUCKER, I.M.S., and the local Executive Committee for the success of the meeting. Lt.-Col. Jennings showed himself a born organiser and is entitled to the thanks of all.

To those of us who remember the **First Indian Medical Congress**, held in Calcutta in December 1894, it is inevitable to make comparisons. As Surgeon-General SIR GERALD BOMFORD said at the closing of Section II, the work done at this Congress was rendered possible by the resolutions passed at the Calcutta Congress of 1894. Those resolutions, he said, pieced the thick Ectoderm of Government and resulted in the Research Laboratories and the fine research work which formed so prominent a feature of the present Congress; work—but though this is the truth it is not the whole truth, for though the Resolutions of the Calcutta Medical Congress were the arrows which pierced the armour of indifference, the force which sped the arrows was **The Plague**. Had not plague followed within 18 months after the Congress of Christmas 1894, is it certain that the Resolutions would have borne fruit so quickly? Any one who remembers India in those prebacterial days will know that it is plague to which we are indebted for the fine laboratories and the able band of devoted Research workers of the present day; that these men were ready to hand and sprang up at once to take their places in the newly founded Laboratories is almost entirely due to one man, SIR ALMOTH WRIGHT, who moulded the minds of the men at Netley of that day and whose influence is still felt in the work of every Laboratory in India, and yet this is the man the Army Authorities could not retain for the new Medical Staff College in London!!

The way in which the onset of plague forced the hands of the Government of India is altogether analogous and identical with the way the cholera of the middle nineteenth century forced on English Sanitation, till it has become the model and the wonder of less fortunate countries. The Broad

Street Pump did for sanitation in England what the plague infected granaries of the port of Bombay have done for sanitary science and Research in India.

As the marked feature of the first Indian Medical Congress in 1894 was the absence of organised research, so this Congress of 1909 will be remembered as one in which **Research Work** took the leading place. Apart from the sound work done in the surgical section, nearly all the important work came from the Laboratories and from the special Commissions by which alone subjects such as plague, dysentery, malaria and black-water fever, etc., can be studied.

Two great subjects still remain—**Dysentery and Beri-beri**. The subject of dysentery has been taken up by the Research Laboratory, but beri-beri still remains the most mysterious disease of the tropics. **Cerebrospinal Fever**, a disease which does not receive the attention it deserves, seem likely to fall into line, and to be spread by the bacillus-carrier who spreads the disease from the nasal mucous membrane.

The impetus given to the study of tropical medicine by the first Congress has borne good fruit in Bombay. Let us hope that a few years hence **Madras** will take up the medical man's burden and give us another and equally successful Medical Congress.

W. J. B.

I. M. S. DINNER.

The biggest I. M. S. Dinner on record was a suitable finale to a most successful Congress. No less than 97 I. M. S. officers joined in the Dinner, including seven of the men just arrived by Troopship the day before. The Director-General presided, H. E. the Governor of Bombay was the principal guest and Surgeon-General Benson was Vice-Chairman. Dr. Shiga, Prof. Musgrave, Surgeon-General Sloggett, C.M.G., and Col. Forman, A.M.S., and Ronald Ross were among the guests.

It was an excellent dinner and a very pleasant reunion.

Enteric Fever, DYSENTERY, PLAGUE, ETC. LIEUTENANT-COLONEL D. SEMPLE, R.A.M.C. (*ret.*), Director of the Central Research Institute, contributed a most valuable paper on **Enteric in India** especially with regard to its prevalence in British Troops. We can only quote the following summary:—

Sources of infection.

The recognition of the fact that man is the storehouse of infection lies at the root of the ætiology of enteric fever.

Those who harbour infection may be divided into four classes.

1. Persons suffering from enteric fever diagnosed and treated as such.
2. Persons suffering from enteric fever but not diagnosed or treated as such. This class would include mild attacks in which the true nature of the disease was not suspected; and possibly many

cases diagnosed and treated as ordinary diarrhoea or simple continued fever.

3. Convalescent enteric patients who have become "bacilli carriers."

4. Healthy persons who have never so far as we know passed through an attack of the disease, such as attendants on enteric fever cases, or persons who have been subjected to the same opportunities of infection as those who contracted the disease; probably temporary harbourers of infection, infective but not infected in the ordinary sense of the term.

Class 1 is the least dangerous, owing to the fact that the disease has been recognised. The remaining three classes may be looked upon as the real propagators of the disease in India, especially class 3.

(6) Channels of infection.

In epidemics, a common source of food, water, or milk supply are the usual channels by which the infection is conveyed.

In endemic cases, contact infection plays the most prominent part, and next in importance comes the contamination of food, milk, and drink supplies. Of these food and drink supplies, milk is perhaps the most important, and water for drinking purposes in India is of secondary importance.

The opportunities for spreading infection are numerous in the cases of harbourers of the virus who have anything to do with the preparation or handling of food or dairy supplies. Cooks, bakers or dairy men who happen to be bacilli carriers are perhaps the most dangerous people of all, on account of the opportunities they have of handling media suitable for the dissemination of infection.

In crowded camps, and where the disposal of infected excreta and other sanitary measures are difficult to carry out, flies may convey infection, but under ordinary conditions of life it is questionable whether these agents account for even a small percentage of cases.

Preventive Measures.

Any sound methods of prevention must take into account the sources from which the infection is derived, *viz.*, enteric fever patients, and bacilli carriers.

Methods of prevention which fail to take these sources into consideration can end only in failure and disappointment.

It is necessary to find out and isolate all those who harbour infection, and with this object in view particular attention should be paid to accurate methods of diagnosis; to chronic carriers; and to those who live under conditions where infection may be expected.

Before convalescent enteric patients are discharged from hospital or the sick-room, steps should be taken to ascertain whether they are free from infection, and any who are found to be infective should be detained until a definite conclu-

sion has been arrived at as to whether they have become bacilli carriers.

Bacilli carriers should have their conditions explained to them, and they should be warned of the importance of cleanly habits. Disinfection of their excretions should be insisted on. On no account should they be employed in the preparation or handling of food, milk or drink supplies. In a word they should be debarred from any kind of work which gives them opportunities for infecting other people.

At present we know of no safe and reliable method by which a bacilli carrier can be free from infection.

As regards hygiene measures, a scientific method of sewage disposal and a pure water supply are the most important.

Prophylactic Inoculation.

Prophylactic inoculation is strongly recommended for Europeans of the susceptible age period. It is especially applicable to young officers (Military and Civilian) and young soldiers on proceeding to India for their first tour of service, and it should be carried out shortly before or immediately on their arrival in the country.

DR. JAMES DAVIDSON read useful paper on **Typhoid Fever at Travancore**; he discusses various points and joins issue with Leonard Rogers on several matters.

It is a pity that more attention was not paid to the important and little understood subject of **Hill Diarrhoea**. The only paper we came across on the subject is one by DR. A. G. NEWELL, of Kurseong in the Darjeeling Hills, the Editor of *Public Health*—

"With some experience of the disease and ordinary observation I came to the conclusion six years ago that hill diarrhoea is due in the first place to the diminution of atmospheric pressure causing a deprivation of the blood from the internal organs, and as the blood of most subjects of this disease is none too much in quantity nor of too excellent a quality there is necessarily a diminution of the functional activity of the organs so deprived of blood. Consequently if the liver and bowels are deprived of some of their blood owing to the sudden rush of more blood to the surface of the body it is not surprising that the secretory activity of such organs will suffer, and if the diminution of atmospheric pressure is accompanied by a marked diminution in the temperature of the atmosphere, as happens in India where people from the plains rush to the cooler hills, it is only to be expected that such organs will fall an easy prey to the action of chills. Therefore the sudden difference in altitude demands a greater care against the exciting cause—a chill; the former being regarded as the predisposing cause as well. A man, coming from the plains of India, with a watery blood of diminished and enfeebled blood corpuscles, to the heights of Darjeeling will deprive his internal organs of a certain quantity of blood as a

result of the diminished atmospheric pressure, and these will become liable to chill if not properly covered by *sufficient* garments of a *suitable* nature to keep them warming, lessening the depletion and counteracting against chill. This is all the more necessary when one considers that however sufficiently clothed a certain amount of depletion of internal organs is bound to occur by a greater supply of blood to the lungs and to the exposed parts of the body. Note the greater difficulty of getting one's breath on first arrival on higher altitudes and the early acquirement of rosy cheeks as evidences of the action of diminished atmospheric pressure."

With body *sufficiently* protected there is lessened the danger of the chill, and time is given for the body to make up new corpuscles and sufficient blood for the altered environment. I have not seen anywhere this view of the causation of hill diarrhoea and I think this atmospheric theory of mine is the probable one—chill being only the exciting cause under the altered environment so caused and possibly in some cases chill may be absent, though I should think rarely. Chill itself will not cause it as chill of these organs may be encountered in the plains but with no hill diarrhoea as we know it. My experience of the disease during six years has only tended to confirm these views. The organs affected are the liver, gastrointestinal tracts. There is a diminished activity of them leading to lessened and defective secretions whereby gastrointestinal digestion is interfered with an intestinal floræ, which under normal conditions are kept in hand, grow luxuriantly and aid the alteration of undigested debris with putrefaction. People born in the hills as the natives of the place do not usually get it being immune from birth more or less. A native hill child is usually brought up with very little clothing on and this, with hereditary immunity, protects them from chills. But I have seen hill diarrhoea in the rains both among children and adults among natives. These have occurred from exposure to rain and living in wet clothes but even in these cases recovery is speedy. As regards the *mica* theory I cannot but regard that as a pure myth. There is no proof of it.

LIEUTENANT-COLONEL W. J. BUCHANAN'S paper on the **Prevention of Dysentery in Jails** was mainly an appeal to medical officers to use the clue afforded by Captain Forster's recent researches, *viz.*, that the convalescing and sick persons were the danger and as long as they continued to shed dysentery bacilli so long would there be danger of the infection spreading. From this, as in the case of enteric fever, there followed as a necessity the careful isolation and separation in "post dysentery" gangs of all those recovering, and other obvious precautions as to a disinfection of clothing and bedding and care of latrines, etc.

This was followed by CAPTAIN W. H. E. FORSTER'S excellent paper on the same subject.

MALARIA.

We give a short summary of the chief papers on malaria.

MAJOR ROSS' views—A Summary:—

"It should be observed from what has been said that the measurement of malaria in a district will cost Government little or nothing beyond, perhaps, the ordinary travelling expenses; and will involve but small additions to the work of officials. The measurement being completed, the sanitary department is now in a position to commence the campaign, if such is decided upon, without further investigation. I say so advisedly, for reasons which will appear presently.

Fortunately we have **Many Weapons Against Malaria**; and they have been so frequently described and discussed that it is unnecessary to labour the point here. They may be classified as follows: (a) parasite reduction by the use of quinine; (b) mosquito-reduction by drainage and other means; (c) subsidiary measures, such as wire gauze, segregation, public instruction, and so forth. Each measure has its own advocates; but after ten years' experience we may, I think, venture to lay down without further discussion the following rules regarding the special applicability of each:—

(1) All anti-malaria measures are good and useful; and each should be employed in its proper place.

(2) For cities, towns, large stations, and other dense populations, mosquito-reduction will probably be the most appropriate measures, because in such (a) the cost of drainage benefits a large number of people and can be better borne by them; (b) its cost will probably be less than the cost of effective quinine distribution among so many; (c) the measure will tend to remove other diseases and annoyances besides malaria; and (d) it can be carried out by the authorities on their own initiative, without making demands on the populace to take drugs, use mosquito nets, and so on.

(3) For scattered populations, small villages, and rural areas, we must generally fall back upon quinine, because the cost of drainage (which is as great, or greater, in the country as in the city) is likely to prove too much in comparison with the benefits likely to accrue from it.

(4) In the presence of severe malaria, both mosquito-reduction and parasite reduction should be employed together; and the subsidiary measures are to be used in special cases.

In considering this list, the Sanitary Officer will always ask, where is he to begin? What must he do first? The answer may be put in the form of the fifth rule:—

(5) Begin with those measures which can be immediately adopted, that is to say, as a general rule, with the cheapest ones.

Neglect of this rule has led to many disappointments. I have known of cases where the Sanitary Officer has begun at the wrong end, as for instance by demanding of Government an enormous sum for draining large marshes, and this, often, without any attempt at preliminary enquiries regarding the amount of malaria, or the actual effect of the marsh referred to. Government had wisely refused and the Sanitary Officer has then sat down "sulking" and done nothing.*

Of the papers dealing with this important tropical disease none is more complete than that by MAJOR S. P. JAMES, I.M.S., D.P.H., on **Malaria in Mian Mir**. It will be remembered that Major James and Capt. Christophers conducted an experimental inquiry with the possibility of preventing malarial fever in this cantonment and those experiments carried out in any early stage of our knowledge of malaria prevention were subjected to considerable and, it is said, hasty criticism. We may quote *in extenso* the following remarks by Major James which show the advance of opinion in the past five years:—

"It is now a matter of common knowledge that we were unable to demonstrate that Anopheline mosquitoes and malaria can be appreciably reduced by the new method in Mian Mir, and I believe I am right in saying that largely as a result of our experiments and of those at Freetown a great change occurred in the opinions and practice of nearly all advocates of mosquito reduction as a means of reducing malaria. The change to which I refer has not been emphasised by those who have written the history of anti-mosquito work, but it will be evident if I place side by side the opinions which prevailed in the early years of this work and those which prevail at present.

Opinions in the early years.

The task of reducing Anopheline mosquitoes is very simple and exceedingly cheap. These are the great advantages of employing this method of reducing malaria. Financial considerations have frequently prohibited the employment of the old method of reducing malaria by drainage of the soil; they can scarcely prohibit the employment of the new method.

The task can be accomplished by such works as are within the compass of mosquito brigades; large drainage and other engineering works are not necessary.

Efforts localized to such small areas as the immediate neighbourhood of particular groups of houses or barracks will be followed by a reduction of malaria in these houses or barracks.

It is easier to eradicate "Anopheline" than "Culex" mosquitoes.

Present Opinions.

In malarious places like Freetown, Mian Mir, Panama, etc., the task is very difficult and expensive. In all operations much money must be spent, the amount being regarded by some authorities as a good test of success or failure in the operations.

Large drainage and other engineering works in connexion with water-supply, filling up or draining marshes and swamps, abolishing irrigation, restricting cultivation, paving roads, etc., are essential—a return to the methods of the ancients. Such work as can be accomplished by mosquito brigades is entirely of subordinate value, but is necessary in order to complete and keep permanent the good results effected by the above measures.

In malarious places the results of measures localised to such small areas are inappreciable, however carefully the measures may be carried out.

It is easier to diminish the numbers of "Culex" and "Stegomyia" than of "Anophelines" but the complete eradication of any kind is impossible.

I think this remarkable change in opinion deserves to be chronicled on account of its importance to those who in any place are called upon to decide what measures for the reduction of malaria shall be employed. To those who are able to specify the really malarious localities in India, it must be obvious that as soon as the destruction of mosquitoes is admitted to be expensive, the measure at once becomes impossible of accomplishment in the very places where the reduction of malaria is most necessary; financial considerations, as Major Ross has said, prohibit its employment.

Before stating the results of my work I must mention, on the authority of Lieutenant-Colonel Rowan, that for the last three years it has been the practice to give quinine twice weekly not only to all troops and followers but also to their families and to the children in the Bazaars; and that during my visit I found that a Hospital Assistant was on duty solely for the purpose of administering quinine to children in the British Infantry and Sudder Bazaars. In the lines of native regiments the quinine was administered to the children by the Hospital Assistants attached to the different regiments. I have no knowledge of the thoroughness with which the measure was carried out generally, but I must say that, being aware of the arrangements and having on one occasion seen the children in the Native Cavalry lines to receive their doses, I was surprised to find so many children heavily infected with malaria parasites.

We are now in a position to enter in the following tables all the information that we possess regarding parasite and spleen rates in Mian Mir since anti-malarial operations were begun in that Cantonment.

* We have not seen a copy of this important paper. We quote from a newspaper account only. ED. I. M. G.

I.—*Mian Mir as a whole.*

—	Oct.-Nov. 1901.	October 1908.
Parasite rate per cent. (endemic index) ...	37.5	80
Spleen rate per cent. (splenic index) ...	52	69
Number examined ...	For parasites 128 For spleens 128	For parasites 147 For spleens. 141

II.—*Specified localities in Mian Mir.*

—	Oct. 1901.	Oct. 1902.	Oct. 1903.	Oct. 1908.	
British Infy. Bazaar {	Endemic index ...	52	41	...	68
	Splenic index ...	80	69	77.5	64
Royal Arty. Bazaar {	Endemic index ...	35	20	...	78
	Splenic index ...	75	64	64.5	...
Royal Arty. Hospital Followers and Syce Lines. {	Endemic index ...	56	...	...	80
	Splenic index ...	48	...	60	85
Native Cavy. Lines {	Endemic index ...	25	...	...	85
	Splenic index ...	36	..	...	55
Native Infy. Lines (Dogras). {	Endemic index ...	...	...	...	95
	Splenic index ..	...	...	...	79
Native Infy. Lines (Pioneers). {	Endemic index ...	...	...	...	83
	Splenic index ..	...	...	...	74

It appears to me that from whatever standpoint these figures are regarded, the answer is as unequivocal as it is disappointing. I had hoped that it might at least have been possible to say that the anti-mosquito operations had mitigated though they had not prevented the epidemic, but if we consider for a moment that although many of the children whose blood was examined had undoubtedly been taking quinine at least once a week, parasites were present in the blood of from 68 to 95 per cent., we must conclude that the difference between a prevalence of this degree and one which is worse is inappreciable. In this opinion I feel sure I shall be supported by Medical Officers at Mian Mir who were able to observe the terrible havoc wrought by the disease among troops and followers in the Cantonment.

The lessons to be learned from the Mian Mir experiments are extremely important from the point of view of the military authorities and from that of administrators in general, but since in the present paper any remarks on this subject would have to be presented in a form that might, on account of its brevity, seem dogmatic, I do not intend to refer to them here. I will say, however, that after our operations of 1901 to 1903 were concluded, both Captain Christophers and I had hoped to obtain from those well qualified to judge some valuable constructive, rather than destructive, criticism; and that we obtained

none of the former but much of the latter. If it had been otherwise, I can scarcely suppose that the military authorities (who aimed of course at the prevention of malaria among the troops only) would have carried out a system which has not only proved ineffective for the purpose they had in view, but has resulted in reconverting the Cantonment into the arid desert which it was fifty years ago.

Another very valuable paper on **Malaria** is that by CAPT. S. R. CHRISTOPHERS, M.B., I.M.S., and DR. C. A. BENTLEY, whose recent work on blackwater fever is well known to our readers. This paper is called the **Human Factor in Malaria**

The etiology of malaria is not to be summed up in the anopheles or even in the parasites.

The Human Factor has to be considered. Koch has described three types of villages in a malarious country, those with little or no malaria, those with malaria among children only, and others with extensive infection of the general population. On inquiry he found that this latter type of village invariably possessed a shifting population and was subject to the influx of susceptible newcomers, to which facts he ascribed the prevalence of the disease. A continual immigration similar to that described by Koch is conspicuously present in the Duars, Assam and elsewhere in India, and must play a considerable part in influencing malaria in these districts.

Stephens and Christophers, again, have observed a greater prevalence of malaria among low class communities than among those of better social status in the same locality. Celli, too, has shown that the prevalence of malaria in the Roman Campagna is closely bound up with the social and economic condition of the people.

A factor which appears to be scarcely less important than non-immune immigration, is the effect of physiological poverty and hardship in maintaining a condition of residual infection.

Labor in the Tropics, whether in India, Africa or elsewhere, is usually of the kind known as "coolie labour" usually collected from far and wide and settled down in labour camps somewhere in the immediate neighbourhood of the scene of operations. Labour camps, which are more or less of a temporary nature, may contain some hundreds or even several thousand inhabitants, but they resemble neither village nor town, for the rude shelters and huts which form the vast majority of the dwellings are almost invariably of the most ramshackle description, while the density of the population on the camp site becomes as great or even greater than is met with in towns. Such aggregations also lack the sanitary arrangements, the permanent houses and the material comforts of abundant food supply and sufficiency of comparatively good water usually enjoyed by urban communities. In addition they are just the size and offer just the amount of aggregation most favourable for anopheles which can breed over a wide area around

and about them. The coolie inhabitants are drawn from various localities, often from different provinces or perhaps distant countries; some come from malarious places, others from regions comparatively healthy; some are already infected with malaria, and others when they first arrive are free from infection and very susceptible. Thus month by month, and year by year, if the operations extend over a long period, there is a constant admixture of infected and susceptible persons eminently suitable for the greatest exaltation of malarial infection. Were these conditions to arise in the course of natural movements of mankind and in association with fair prosperity they might prove sufficiently disastrous, but in the conditions peculiar to labour camps we have introduced the other factors and the vicious cycles previously alluded to. Once sickness, debility and anæmia became rife and pressure and frequency of individual hardship becomes enormously increased. Pay cannot be earned by the sick, who may suffer actual starvation. Nor is it only the workers who suffer, for by the inability of partially or completely disabled labourers to earn their pay, their relatives and dependents are exposed to greater hardship and increasing liability to sickness; and the greater the number of sick the more intense becomes the general infection, until as a result an immunity that may protect under ordinary conditions is broken down under exposure to more virulent and intense malaria, so that even those originally the strongest and most healthy become involved also.

Industrial Expansion in the Tropics is but beginning, every year its requirements become more urgent, every year it is taking fresh strides, and on the threshold of every advance, in India as well as in every other tropical country, we are met by the necessity for this industrial aggregation of labour. In the light of our present knowledge it appears probable that in proportion and as a natural sequence to the rise of a tropical country in importance in the sense understood by the civilised world, the conditions we have described will develop to an alarming extent and great tracts of country will be converted into regions of intense malaria with results both disastrous to life and ruinous to prosperity. At the present time a great expansion in coal and other industries is taking place in India. There is nothing to make us believe that deltaic or other physical conditions are necessary for the occurrence of outbreaks of malaria, for anopheles mosquitoes exist widespread throughout the country and can everywhere find facilities sufficient for their continuous breeding; and such being the case we have reason to believe that with each fresh impetus and new direction given to industrial expansion we shall find in the absence of proper measures of control and extension of the geographical distribution of intense malaria, and hear of new areas subjected to the ravages of epidemics. It may be said

that these unfortunate influences the action and results of which we have indicated in broad outline, are in themselves so vast that they lie beyond the power and scope of human interference and that their recognition will not help us in the fight against disease. But though we may not be able to deal with the malaria of a province, whose population numbers many millions, many of whom are probably but little affected by the disease, we can attempt to control the main foci of dissemination. We can deal with malaria among labourers on a railway, canal, coal-mine, or tea-garden in a way that we cannot do with malaria among the more scattered populations of great rural areas; and by this means we can prevent or reduce the occurrence of the otherwise inevitable scourge of exalted and intensified epidemic malaria, and attain an effect that will prove out of all proportion greater than the mere direct result to those immediately concerned: for we must reiterate that far beyond the loss of life and the misery of the actual labourers, is the all-important question of the health of a whole country-side."

We may quote the following extract from the paper by the same authors on **Black-Water Fever** :—

"In Black-water Fever, as we have already indicated, we have reason to believe that we are not dealing with the effects of a toxin elaborated by the malarial parasite, but with the action of substances produced by the human organism itself, in other words, with the effects of an auto-lysin. And if a human auto-lysin is to occur, can we think of any disease condition more likely to produce it than malaria? Malaria actually gives rise within man's body to the very condition we try to bring about in the attempt to produce an auto-lysin experimentally. Under the circumstances which appear necessary for the occurrence of Black-water Fever, the peculiar character of which we have briefly indicated, it is obvious that repeated and persistent blood destruction and resorption must result, and we see again that if our hypothesis, which is only hypothesis, be the true one, why the malignant tertian parasite with its special action upon the red cells and consequent stimulation to their phagocytosis, should above all be the one concerned in the causation of Black-water Fever.

All this is of course hypothesis, but it may serve its purpose of indicating in a very broad and general way how Black-water Fever may be malarial in origin and yet not be malaria."

A paper by MAJOR C. DONOVAN, I.M.S., on **Kala Azar** was naturally welcomed. His paper was chiefly confined to certain factors not usually recognised. The following note is of more than historical interest:—

As far as the Madras Presidency is concerned the disease is very limited in its distribution, being strictly confined to the municipal boundaries of the Corporation of Madras and particularly so

to the old native city, previously called Blacktown but now more euphemistically known under the appellation of Georgetown, in honour of the recent visit of His Highness the Prince of Wales.

The cases admitted from the district have, on closer investigation of their history, invariably been found to have contracted the malady within the city precincts. Kala Azar has evidently existed in Madras for a long time; it has been well-known as "Blacktown Fever" for the last 30 years at least; I remember on my first arrival in Madras now nearly 18 years ago, Col. King, the late able Sanitary Commissioner of our Presidency, speaking to me of its existence in Blacktown and comparing it in its malignity to the dread malarial fever of Cuddapah. He considered the disease, as well as I recollect, to be a form *sui generis* and not the ordinary malaria. Up to the end of last year, I have had 319 admissions for this disease in my wards, that is, since I discovered the parasite in the spleen blood of a boy named Doraisamy, on the 16th June 1903. In addition to the above number, I have seen and examined, roughly speaking, about 150 in the wards of the other three physicians attached to the General Hospital.

This gives a total of about 530 cases that have come under my observation. Of my own admissions, there occurred 30 in the half-year 1903, 110 in 1904, 140 in 1905 (I was absent on leave in 1906), 40 in the half-year 1907 and 59 last year. The admissions for this disease do not appear to be so frequent or of so virulent a nature as previously. What the old physicians would call a "change of type" has taken place. I throw out this suggestion very guardedly, as I have not had the same number of severe cases as in previous years.

Being dissatisfied with my attempts in bringing about an infection of *Cimex* with *Leishmania* and procuring the flagellate forms, I searched for some other blood-sucking insect, of local distribution and not so universally spread as the ubiquitous bed bug and at the same time commensurate in its range with the occurrence of Kala Azar. In my search I came across an insect answering one of the two above desiderata, and although, up to the present, I have not met with any success in propagating much less transmitting *Leishmania* by its means, I consider the find may be an interesting factor in the causation on some disease not necessarily Kala Azar. The insect in question is a black and red bug (*Conorhinus rubrofasciatus*), of large dimensions, about 20 to 25 millimetres, or, roughly speaking, about an inch in length; it comes occasionally to the light of a lamp into rooms at nights and appears to be widely spread in Madras.

It is popularly supposed to suck the blood of human beings and also to feed on the common bed bug; from its latter propensity it is called, according to some of my informants, the "mother of bugs," on account, I suppose, of her unmatronly habit of devouring her smaller relations. This

predatory habit of bed bugs is also attributed to its European representative, *Reduvius personatus*, so a certain amount of credence is to be placed on one of the above popular statements of its habits. Both the male and female insects I have captured, contained either fresh or digested mammalian blood in their guts; whether human or not I regret I am unable at present to determine, but hope to procure the opinion of a bacteriologist at some subsequent date.

These bugs readily suck human blood when placed, confined in either a glass bottom box or test tube, on the body of a person; they insert their proboscis and begin to suck as if to the manner born. Both the male and female imagines suck human blood, but the nymphs are much more blood-thirsty, starting to insert their proboscis immediately they are placed on a patient, while the adults take a minute and more before they settle down to a meal. In the gut of the adult insects, in nearly 90 per cent., large numbers of flagellates of the genus *Crithidia* are found, but no *Herpetomonas*.

This reduviid bug has a wide distribution both in and out of India. Distant, in the Fauna of British India Series, Rhynchota, Vol. II, p. 286, gives the following habitats:—Sylhet, Bombay, Borghat, Calcutta and Mysore, Ceylon, Andaman Islands, Burma, Toungoo and Mandalay. Outside India it is widely spread throughout the Malayan Peninsula and Archipelago; recorded from Madagascar, West Africa and generally found in the Southern Nearctic and Northern Neotropical regions and in the Antilles.

As mentioned before, this insect's habits are nocturnal; both the male and female, the former more frequently, fly into the verandah or room attracted by light. It is found all the year round and I have procured specimens from all parts of the city of Madras.

Attempts at cure by (a) drugs: (b) by bringing on inflammation and (c) by change of residence.—(a) I cannot state that the drugs I have tried have had any beneficial and lasting effect. Among some of the number I may mention the various salts of quinine in large doses, both by mouth and intramuscular injection *ad nauseam*; *Liquor Arsenii et Hydrargyri Iodidi*, with and without *Vinum Antimoniale*; *Fuchsine* and latterly *Thymol* dissolved in rectified spirits. At first I was under the impression that *Fuchsine* was giving satisfactory results, but I have now changed my opinion. The amelioration was transitory. A single patient, a boy of about 14 years old, was the only exception: he was persuaded to stay in hospital for six months and took 1 c. c. of a 20 per cent. solution of *Fuchsine* three times a day during this long period. He is now, 18 months after, in perfect health and is working in my laboratory at the hospital. The other physicians here have tried X-rays, *Atoxyl* and *Soamin*, but no marked change has resulted from such treatment.

(b). *By bringing on inflammation.*—I have had a cure of another patient after a very severe attack of cancrum oris and in the wards of the Fourth Physician, Capt. E. W. Browne, I.M.S., a patient is on a fair way to recovery after facial erysipelas.

(c). *Change of residence.*—“Change of air, especially to a dry hot climate, appears to bring about a cure in some of the cases. A few of my old Kala Azar patients have returned to see me, restored to health and apparently quite well. I may mention such places in our Presidency, answering to suitable sanatoria (if I may use the expression) for Kala Azar; to wit, Kurnool, Cuddapah and Anantapur.” I made this statement in our General Hospital Report for 1907. Since then I have sent two patients to Cuddapah; one of them returned after a month with but slight improvement, and the other, after a three months' stay there, returned to his native place very much the worse for the change; he suffered all the time he was at Cuddapah, with the most marked intermittent rises of temperature I have known in Kala Azar, the temperature ranging from normal to 105° F. and occurring twice a day. Both these patients have since died.

ORIENTAL SORE.

One of the best bits of original work put before the Congress was that on Delhi boil or Oriental sore by Dr. R. RAO, M.D. (Lond.), of the Petit Laboratory, Bombay. It gives an account of his work on the cultivation of the parasite of these sores, and it is hoped that it will help to clear up the question of the identity or otherwise of the parasite of these sores and of the Leishman-Donovan bodies which cause such a very different disease. We quote the following:—

The developmental stages of the parasite can be divided according to its three or four distinct changes in size and shape, and for descriptive purposes the following nomenclature has been adopted in this paper:

- (I) Precultural stage.
- (II) Early preflagellate stage where increase in size, division and multiplication are in progress.
- (III) Mature preflagellate stage where the relative position of micronucleus and macronucleus is determined and the trace of the future flagellum is obvious; after this no division of the individuals takes place.
- (IV) The flagellate stage where the individuals after reaching their full development as regards their body as well as the flagellum, swim about freely in the serum. After this no further development can be seen.

PLAGUE.

As was to be expected, the subject of Plague received much attention, though there was not much that is new in any of them. The most important of these papers was one by MAJOR GEORGE LAMB, I.M.S., Member of the Advisory Committee for Plague investigations; his paper gives a very lucid and complete résumé of the whole subject of the **Epidemiology of Plague**. He discusses on various theories of transmission, direct contact, aerial infection, soil infection, by means of food, and by means of the rat-flea. He ably summarises the evidence that the rat-flea is the transmitting agent from rat to rat and from rat to man.

We cannot do justice to the logical and convincing way the evidence is produced in a summary; we must refer to the paper itself, but may quote Major Lamb's concluding remarks:—

“Finally, I beg to put forward the following general conclusions which, as regards the question of prophylaxis, are of the greatest importance:—

1. Bubonic plague in man is entirely dependent on the disease in the rat.
2. The infection is conveyed from rat to rat and from rat to man solely by means of the rat-flea.
3. A case of bubonic plague in man is not in itself infectious.
4. Insanitary conditions have no relation to the occurrence of plague, except in so far as they favour infestation by rats.
5. Plague is usually conveyed from place to place by imported rat-fleas, which are carried by people on their persons or in their baggage. The human agent not infrequently himself escapes infection.”

CAPTAIN W. GLEN LISTON, M.D., D.P.H., I.M.S., read an excellent paper on the **Prophylaxis of Plague** in a country already infected like India.

He states that plague is “essentially” a rat disease and in this respect is like rabies or glanders. These conditions favour the presence of rats, abundant food, ample shelter and the absence of enemies. He enumerated the defects in houses which provide these conditions for rat life.

Systematic Rat-trapping as a Method for destroying Rats.

Experiments conducted by the Plague Commission and others have shown that in the conditions found in this country, it is necessary to remove a larger number of rats than is represented by the human population of a town or village, if success is to attend measures of rat destruction. Experience has demonstrated that the most satisfactory way to directly diminish the number of rats in a village is to set a large number of traps systematically. Much depends on the thoroughness

and system of the operations. I cannot here fully enter into this subject; perhaps others will consider it, but I may say that a number of traps, equivalent to at least 2 per cent. of the population, must be used. The traps should be regularly and carefully set, and precise notes kept as to where the rats have been caught. Working in this orderly way, it is possible to find out where rats abound and what conditions favour their presence; in short, we make a careful study of the rats. It is then only necessary to take in hand the improvement of the rat-infested premises; such a place, in a plague-infected country, should be legally considered a nuisance, and the owner should be called upon to abate the nuisance. In thus combining our frontal attack with flanking movements, we will best be able, as in war, to bring about the discomfiture of the enemy.

Rat destruction generally fails, because the extent of the operations is not always properly gauged.

In concluding the consideration of this part of the subject, I must emphasize the fact that often those who undertake rat destruction have little idea of the magnitude of the task. When they meet with failure in preventing the spread of plague, many attribute this to the uselessness of the measure, disregarding the fact that the organisation and thoroughness of their operations have been defective, not the principle on which they were based.

Importation of Infection, the chief means by which the disease is spread from place to place.

Rats can only do harm, so far as plague is concerned, when they become infected. We know that infection is carried from rats of one place to those of another by human agency. Starved and infected rat-fleas, deprived of their natural hosts which have been destroyed by the plague, take to man, and are carried in the clothing and kit of fugitives from plague-infected houses to healthy localities. Here, again, the fleas brought in proximity to rats take to these animals in preference to their temporary human host, and infect the rats. Importation of infection in this way is the chief, if not the only way, in which towns and villages become infected.

Disinfection of Clothing and Kit of Travellers is an important plague measure.

It is necessary, therefore, to take measures against this important means by which infection is spread. The prevention of the importation of infection from infected places to healthy towns and villages is our second line of defence against plague. Disinfection of the clothing and kit of persons coming from infected places is a very necessary, though now neglected, measure. The comparative success of the prevention of the spread of plague over sea can, no doubt, to a large extent, be attributed to this precaution. As a means of preventing the spread of plague on land it has been abandoned, mainly because, in practice, it

has been shown to be not quite perfect. This seems to be a poor argument for discontinuing so necessary a safeguard.

MAJOR BROWNING-SMITH, I.M.S., contributed a very practical paper on a very important plague problem. **The Recrudescence of plague.** This valuable paper would be spoiled by an attempt to synopsis it, but we may quote the following summary as given by the author himself:—

“In the examination of the figures, and instances, which has now been completed, it has been shown that—

(a) Continuous signs of active infection remain in a few places in the Punjab throughout the period of abatement and definitely connect one epidemic with the following one.

(b) The hot weather interval is occasionally marked by sporadic signs of infection in rat and man.

(c) Such infections (A and B); however, only constitute a small part of the origin of the annual widespread visitation.

(d) Recrudescence of plague occurs in a very considerable number of cases, after an interval during which no signs of infection are apparent.

(e) This interval between the epidemics of two successive plague seasons varies from quite a short one to one extending to many months or even a year.

(f) Recrudescence may possibly occur after a still longer interval including a complete plague season.

Although it must be admitted that the factors governing recrudescence are but imperfectly understood, it is possible to postulate from past experience certain general laws—

(a) Recrudescence tends to appear early the next season in those places which have suffered only incomplete epidemics in the previous one, that is to say, where the epizootic has been cut short by the hot weather before affecting the whole of the rat population.

(b) An incomplete epidemic is not a necessary precursor, for importation may be effected late in one plague season without any epidemic or even any signs of epizootic until, after an interval of apparent freedom, recrudescence occurs.

(c) Recrudescence following complete epidemics, where the rat population has been completely dealt with before the hot weather, more generally appears late in the following plague season, presumably because time for the recovery of the rat population is necessary.

(d) The severity of the epidemic accompanying the recrudescence will vary directly with the incompleteness of the previous one; the less the rat population has been affected during the first epidemic the more severe will be the following one.

(e) Generally, therefore, recrudescence occurs earlier and is more severe after incomplete than after complete epidemics.

(f) The more insanitary a locality is, the more liable it will be to recrudescence. The reappearance of infection usually occurs in the most

insanitary part of a locality, in houses, dark, damp and ill ventilated. Briefly, all conditions favouring rat and flea infestation are favourable for recrudescence."

We may also note that Major Browning-Smith's experience will not allow him to accept the axiom of the Advisory Committee "that **The Non-Epidemic season** is bridged over by acute plague in the rat accompanied by a few cases in human beings." For a discussion of this point we must refer the reader to the complete paper.

DR. G. J. BLACKMORE read a paper on suggestions for preventing the **Carriage of plague by Sea**. He specially emphasises the need of disinfecting clothing and the destruction of rats in the docks of infected ports—"a measure so strangely neglected in India."

The attempt to prevent rats from passing on to ships lying alongside wharves or dock walls must, I think, be confessed to have failed, and it is difficult to conceive of any really effectual measure which would at the same time allow the ordinary loading and unloading work to be carried on unhampered. Even if rats could be prevented from passing on board themselves, a certain number would be carried on board in cargo and baggage. If, however, there were no rats in the docks, none could gain access to the ships excepting the few that might be in articles of cargo. There can then be no doubt whatever that even if measures are not taken to free infected ports of rats, at least every effort should be made to rid the docks of them, and with properly organised, persistent and systematic efforts, the attempt should meet with such a measure of success as to render the exportation of plague very improbable.

The first essential is a properly trained and equipped rat-destroying staff, whose sole work should be to attempt to keep docks free from rats; spasmodic efforts by untrained men are quite useless; the war against rats, if it is to be successful, must be carried on continuously and relentlessly. There are various methods in use for destroying rats, and the chief of these may be indicated:—

1. By the use of traps.
2. By making use of the natural enemies of rats, such as dogs, cats, and ferrets.
3. By the use of poisoned food.
4. By introducing a fatal infectious disease among the rats.
5. By using poisonous or irrespirable gases.

The indefatigable Dr. N. H. CHOKSY presented many papers to the Congress, all of them of considerable length and chiefly reproductions and synopses of his many well-known writings on plague— one of his papers was on **The Clinical Significance of Septicæmia in Human Plague**—which is summarised as follows:—

1. There exists no single clinical sign or symptoms whereby the presence of a septicæmia can be recognised at the bedside.

2. A strong presumption of septicæmia is raised by a thready, compressible or imperceptible pulse, especially if accompanied with great nervous prostration, jaundice and rapid wasting of the face.

3. Although a patient with a septicæmia may recover, the probability of recovery is only 3—4 per cent.; no recovery with a grave septicæmia is possible; and even with a moderate one, recovery would be greatly helped by the use of the anti-plague serum.

4. Plague marasmus is an almost invariable concomitant in those cases that survive over a week; if acute, it is always fatal; if sub-acute, recovery may take place.

MAJOR R. F. STANDAGE, I.M.S., has a brief and useful paper on **Anti-Plague Inoculation** at Bangalore from which we make the following extracts:—

It is this "house to house" inoculation, started on 21st December 1907, which has been the special feature of the anti-plague inoculation campaign in Bangalore, and which has, I think, contributed in no small measure to our success. In Table II, I give the figures resulting from this scheme, and it will be seen that up to the present (15th December 1908), 14½ months after the commencement of the campaign, 40,573 inoculations have been effected, averaging nearly 3,000 a month or 100 a day. It may be of interest from the point of view of the practical application of inoculation to large sections of the community if I explain more fully the details of our scheme. In each principal street of the native bazaar, the house of a prominent citizen, with his consent and in most cases at his request, was converted into a temporary inoculation station. The prophylactic serum, and all the paraphernalia for the sterilization of the needles and of the patients' skins were carried in a specially made hand-cart to the house selected for operations. Here the scene was a busy one; a pandal was erected under which the operations were conducted, a band was in attendance to attract crowds and doubtless to distract the patients' attention from their very slight sufferings. Doles of cakes, sweets and rice were given to the poor whose work may be stopped by the resulting fever and all that could be done was done to make the measure popular. Householders indeed vied with one another to give the most attractive and successful "inoculation at home," and that they have succeeded in popularizing the measure among their friends may be gathered from the fact that as many as 714 were inoculated on a single morning, and that these 714 were of the hitherto intractable Mahomedan community.

As regards the operation itself, the greatest care was bestowed upon the sterilization of needles and of the patient's skin. The operators, of whom as many as 4 worked at one time, stood at tables, on which were arranged syringes, needles and the "Kapadia" lamp for sterilization, provided with a special wind screen allowing the vaseline in the sterilizer to be kept at a constant temperature of

160° in the strongest breeze, a small stand for the bulbs of the prophylactic, a glass bowl containing carbolic solution 1 in 20 and a pair of dressing forceps, used for fixing the needles, after sterilization, on the nozzle of the syringe. A board, with the dosage of the serum as recommended by the Parel Laboratory, was suspended near the table. A clerk stood near each operator and wrote the dose, bottle number, and brew, on a small slip of paper, which was taken by the patient for registration.

I will now discuss the results of this campaign as regards the effects among the inoculated and on the course of the epidemic at large. Among the inoculated the immunity has been most striking. Table III attached to this paper gives the number of attacks occurring among the inoculated since 1st October 1907, and it will be seen that they number only 33 and that the deaths among them were only 13. Table I will show you that the cases occurring among the whole population, which, including the Military, is 89,599 persons, were, during the same period, 1,673 with 1,391 deaths. The first attack of an inoculated person was on 19th October 1907, up to which date 3,239 inoculations had been performed. These figures are, I think, sufficiently remarkable, but are even more striking if the plague attacks occurring among inoculates within 10 days of the operation are excluded, assuming that infection was previous to inoculation and not modified by it. Thus in Table III Nos. 1, 4, 8, 10, 12, 19, 20, 22, 23, 25, 26, 27 and 31, should be eliminated, thirteen cases in all, with no less than 9 deaths among them. Excluding these from our list of attacks among inoculates, we are left with only 20 attacks with 4 deaths, truly remarkable figures when the widespread epidemic in the bazaar at the end of 1907 and the beginning of 1908 is taken into consideration. As regards the results of the epidemic, I cannot, of course, speak so definitely at present. We have now nearly half the population inoculated and might expect a considerable falling-off in the monthly number of cases, and indeed the figures are smaller than in previous years with the exception perhaps of 1901 and 1906. The decrease in the numbers has been especially marked on the latter months of the year, more particularly when compared with last year.

RECRUDESCENCE IN PLAGUE.

The following discussion on MAJOR BROWNING SMITH'S valuable paper on Recrudescence in Plague is of great interest:—

THE THEORY CRITICISED.

“MAJOR LAMB said that all workers of plague problems were deeply indebted to Major Browning Smith for bringing up for discussion the important question of the cause of the origin of the annual outbreaks of plague in the villages of a district such as the Punjab. On the one hand, if the annual epidemics in the villages owed their

origin in the vast majority of cases, to recrudescence of the disease, it would be almost impossible in the present state of affairs to devise practical prophylactic measures which could be relied on to bring to an end, or even to a limit, the devastations of the disease. If, on the other hand, the great majority of the villages in a district owed the origin of the annual outbreaks to fresh importation from some previously infected locality, then the chances of at least limiting the annual outbreaks by well-thought-out measures would be great: so great as to justify a responsible Government in carrying them out as strictly as was consistent with the maintenance of good relationship between the people and their administrators. Major Smith had come to the conclusion that recrudescence of the disease from remnants left over from a previous epidemic was the cause of the outbreak in a very considerable number of villages after an interval during which no signs of infection were apparent. How had he arrived at these conclusions? During the epidemic of 1907-8 an attempt was made by the district plague officers in the Punjab, working under Major Smith's directions, to trace the origin of the epidemics in the case of 277 villages in certain selected districts. The circumstances of each case were personally enquired into, but not until after the first plague case was reported. No attempts were made to examine the rats, the whole evidence being obtained by questioning the village officials and the inhabitants, as regarded rat mortality, the occurrence of plague cases and possible importation. These were the data on which Major Smith placed his case for recrudescence, but it seemed to him that the evidence was of the weakest description, and that, therefore, the conclusions were not justified. One could imagine so many possibilities, so many ways by means of which infected fleas might be imported into a village, ways which it would be impossible to trace, that one marvels at the attempt to correlate such importation of the origin of the outbreak which satisfy any one that importation had not taken place. He for one could not accept such evidence as proof of recrudescence, and he was therefore forced to discard Major Smith's conclusions which were based entirely on the assumption that if no history of the importation could be traced or no evidence of a complete bridge ever could be obtained, the origin of the outbreak must be due to recrudescence. He was not at present in a position to put forward the evidence obtained by the Plague Commission, but their conclusions were different from those of Major Smith, and pointed to the origin of the outbreak in the great majority of villages being due to fresh importation. There would, in consequence, be some hope of limiting the number of villages infected by limiting the importation.

MAJOR BROWNING SMITH'S DEFENCE.

Major Browning-Smith, in reply, said he did not, of course, say that 45 per cent. of all cases were

due to recrudescence, but in the cases under review it happened to be so. He recognised that importation was a very great factor, but at the same time he wished it to be clear that recrudescence was an important matter. He would ask anybody who was interested in plague to study its advent to the Punjab. It did not spread from the small district first infected in a month or two to other places in the Punjab; this was a very gradual process. The geographical conditions prevented its spread for a long time, particularly rivers, and it took years before the Northern and Southern districts were infected in spite of the infections over long distances. No one denied the possibility of infection over long distances; they only said that it was more likely over short distances than over long distances, and he thought that was a reasonable thing to say. But recrudescence was a fact which had been forced upon them. Major Lamb stigmatised their data as unreliable, but it had been obtained by experienced plague officers who knew the people and their customs and had also studied the etiology of the disease; and he submitted that they were not to be lightly dismissed. All he asked was that the Commission should invest the subject on the spot and then if they proved him wrong—and not till then—would he recede from the position he had taken up."

CATS AS PLAGUE PREVENTERS.

WE quote the following from LIEUTENANT-COLONEL ANDREW BUCHANAN'S paper on the value of cats as plague preventers to which we refer elsewhere:—

What I wish to lay stress on is the necessity of choosing what is to be the *ultimate* method of

preventing plague in India. If it is to be by inoculation, then where is all the material and staff to come from? If it is to be by rat destruction, are we medical men to spend the rest of our service in India in learning and practising the art of rat catching? or are we to take advantage of the fact that cats are already numerous in India, although not sufficient, that the excellence of the Indian cat has been placed beyond all doubt, that with the Mahomedans it is a religious duty to keep a cat, that among the Hindus the killing of a cat is considered a great sin, and of the very important fact that of all the measures proposed there is none which the *great* majority of the people will accept so readily.

I would then suggest—

- (1) that attention should be specially directed towards the part played by the cat in preventing plague;
 - (2) that a cat census be taken in selected areas;
 - (3) that arrangements be made for the more equal distribution of cats;
- and (4) that the protection of cats be generally encouraged.

RELAPSING FEVER.

DR. CHOKSY had an excellent, if long, paper on **Bombay Relapsing Fever**, which gives a good résumé of the literature of the subject from its first identification by Vandyke Carter, in Bombay, to the recent work of Captain F. P. Mackie, I.M.S. The paper is too long to summarise but the following **Tabular Statement** puts in a striking way the differences between the various types of this always interesting disease:—

	European.	Indian.	American.	African.
Incubation period	5-7 days	7 days	5-7 days	7-10 days
Duration of first attack	5-6 ,,	5-7 ,,	5-6 ,,	Average 3 days (rarely 4-5).
Duration of apyrexia	7-10 ,,	5-13 days; occasionally up to 19 days.	7-10 ,,	1-8 days (occasionally 10-18).
Number of Relapses	1-2 ,,	1 relapse in 40 per cent., 2 in 7 per cent. and 3 and more in 3 per cent.	One (rarely 2-5)	3-5 days (sometimes up to 11).
Relapses absent	?	In 50 per cent.	Not uncommon	?
Rigors and sweating	Present	Very frequent	Present	Rigors in 50 per cent. only: sweating present. Frequent.
Pains in limbs, muscles, etc.	Do.	Do.	Do.	?
Toxæmia (Bilious Typhus type)	Mentioned	Present in 10-20 per cent.	Mentioned	?
Low pulse rate after crisis	Present	Almost invariably present.	Present	?
The Tongue	Large and moist except in grave infection.	Large, flabby and moist except in grave infection.	Large and moist except in grave infection.	?
Appetite	Poor—sometimes voracious.	Poor—rarely voracious.	Poor	?
Jaundice	Mild—except in grave infection.	Present in 70-80 per cent.; grave in toxæmia.	Mild, except in grave infection.	Infrequent in Uganda.
Vomiting of Bile	Not uncommon	Present in 70-80 per cent.	Not uncommon	Not usual.
Diarrhoea	Of brief duration	Present in 12 per cent.	Moderate	Always in the Congo: infrequent elsewhere.

	European.	Indian.	American.	African.
Tympanites	Grave in toxæmia	Invariably associated with toxæmia.	Grave in toxæmia	?
Hiccough	Present	Often persistent	Present	Mentioned.
Hæmorrhages from stomach and intestines.	Not frequent	More frequent than in the other varieties.	Not frequent	?
The Liver	Enlarged	Enlarged and tender	Enlarged	Enlarged.
The Spleen	Do.	Do. do.	Do.	Do.
Parotitis	Mentioned	Present in about 10 per cent.	?	?
The Urine	High coloured; scanty	Highly bilious; scanty	High coloured	?
Hæmaturia	?	? More frequent than other hæmorrhages.	?	?
Epistaxia	Mentioned	Present in 10-15 per cent.	More frequent than other hæmorrhages.	Mentioned.
Pulmonary symptoms	Do.	Present; more so in toxæmia.	Present	Do.
Delirium (violent)	Do.	Not uncommon; also maniacal.	Do.	Infrequent.
Facial Paralysis	?	Not observed	?	Mentioned.
Eye affections	Mentioned	Present in about 1 per cent.	Mentioned	Frequent (Moffat, Harford and Cook.)
Sub-conjunctival hæmorrhages	?	Not uncommon	?	?
Abortion and miscarriage	Observed	Always	Observed	Almost always.
Mortality rate	Very low; under 5 per cent. except in grave infection.	30-40 per cent. in all cases; if toxæmic cases are excluded 15 per cent.	2-4 per cent., rarely 10 per cent. higher in toxæmia.	13-6 per cent. (?) about 50 per cent. on the Zambesi (?) probably lower.

TROPICAL SURGERY.

As might be expected, the subject of **Cataract** and especially **Smith's Operation** for removal in the Capsule came in for considerable attention.

A very valuable and able paper was read by CAPTAIN W. E. McKECHNIE, I.M.S., on the extraction of cataract in the lenticular capsule, based on three years' experience of the operation at Smith's Clinique at Jullundur.

McKechnie begins by pointing to the great reputation MAJOR HENRY SMITH has acquired as a good index of the value of the operation. He gives a very interesting description of Smith's hospital and hospital methods, and the personality of the man and the value of his operation is all the more emphasised by the poverty and primitive simplicity of the hospital, soon we understand, to give way to a finer hospital with funds raised by the indomitable energy of "Jullundur Smith." The prominence given to this cataract operation in many issues of the *Indian Medical Gazette* of recent years has led many Civil Surgeons to do this operation, but it should always be remembered that Smith has always asked men not to judge of the operation by reading about it but to come and see him. In his forcible way he often says that no one would learn to shoe a horse from reading an account of it.

This appears also to have been Captain McKechnie's experience and we quote as follows from his interesting paper:—

"When, three years ago, I first saw Smith operate, I realised that I had not known how to do the operation. I watched Smith operating for a long time and studied his methods as closely as I could. But when I went back to my own hospital and tried to do the operation I found somewhat to my disappointment and astonishment that I was not

much better at it than I was before. When I saw Smith doing it, it all seemed simple and easy. When I tried it myself, all sorts of distressing things used to happen.

Seeming simple in the hands of an expert, it may be exceedingly difficult if not impossible in the hands of the uninitiated, who is not aware of, or who does not practise, all the little aids which make the operation simple and successful.

I used to watch lens after lens being extracted, entire in its capsule, smooth and glistening: some mature and ripe, some half ripe, others only just beginning to be opaque, and a few the dense black cataracts; some with big and some with small nuclei, some hard and thin, others round and soft and fat. Out they came and into the bottle, lens after lens, without a hitch.

Then Smith began to teach me by allowing me to operate myself under his direction. It is the only way to learn; and I shall always rest under a deep debt of gratitude to Smith for his kindness in teaching me, and for the pains he has taken to render me proficient.

The first thing of which I became aware was that it was much easier to operate in Smith's hospital than in my own. The reason was that the assistant knew exactly what to do. The first lesson, then, is that the assistant is almost as important as the operator. Next I found that there was something to learn at almost every stage of the operation. There were many little things which I had failed to notice despite the large number of times I had seen Smith doing the operation. These little things are important in that they conduce to a smooth and even operation without complications and distractions, and hence lead to a good result.

Smith's technique is such that it may be said to avoid all complications, and in this lies the secret of its success. The eye is quickly and

gently dealt with, and it shows its gratitude by its good behaviour both at the time of the operation and afterwards.

I have now done over 500 extractions in the capsule as a pupil of Smith's. Smith has also taught three other surgeons. The two whom I know and myself can do the operation with ease and confidence and an almost uniform success. Of the other operator, Knapp, of America, I cannot speak from personal knowledge.

The operation, then, can be done by others besides Smith; and the failure of these ophthalmic surgeons who have tried to do the operation and have not met with success is due to their faults of technique and not to the fault of the operation. There is a great deal to learn as to *how* to do the operation, and I can fully endorse Smith's claim that he has evolved the technique of the operation.

As regards the assistant, in his case also a certain amount of practice is required before he can do the work efficiently. His chief duty is the holding of the eye-lid retractor. Simple as this duty may seem, it is not so simple as it looks; and it took me several weeks of daily practice at operations before I became really good at it. The holding of the eye-lid properly is of the very greatest importance as on it depends the safety of the operation."

DR. R. JAMISON, of Belfast, who has been working at Jullundur in **Smith's Clinique**, gives his experience as "an absolute beginner." The paper is one to read and is valuable as the experience of a man who learnt the operation *de novo*, and without having become accustomed to any other method. We quote the following:—

"These arguments have been mainly along two lines: first, the accidents that are liable to happen at the time of operation, and secondly, the remote result of such accidents. The answer to the first is that such accidents as escape of vitreous and rupture of the capsule are extremely likely to occur with the novice, but with increased experience in the proper performance of the operation they become less and less frequent, and there is no reason why any Indian operator should not obtain almost as good results as those of Major Smith himself.

"The answer to the second will be supplied by Captain Lister's paper on the after-results of cases of escape of vitreous, which should banish once and for all the extreme terror that ophthalmic surgeons have hitherto held for what they consider the worst complication next to explosive hæmorrhage that can occur in the course of a cataract operation."

A particularly able and well worked out paper was the one brought forward by CAPTAIN McKECHNIE **On incision of the Eye**, with special reference to incisions for the extraction of cataract and on the relief of glaucoma. The paper is too technical and full of mathematical diagrams and references to admit of adequate

extracts being made, but it will well repay perusal.

Another paper of interest, if certainly lengthy, is by CAPTAIN H. GIDNEY, Civil Surgeon of Dhubri. In an able way he sums up what the author calls the "battle of the Capsule" and gives the arguments for and against Smith's operation very clearly and well. We may quote the following remarks on the subject of the loss of vitreous:—

"Frequent Loss of Vitreous.—The frequency of this complication is pointed out as the "chief" drawback of extracting in the capsule, and to this is attributed the immediate and remote consequences I have already enumerated. Before discussing them I shall first refer to the frequency of escapes in both operations. In Intracapsular, the percentage varies from 6 to 38 per cent., being dependent on many factors, *e.g.*, behaviour of the patient during and after extraction, size and position of the incision, being more frequent the nearer it approaches the sclera and *vice versa*; skill and experience of the operator and assistants, especially for left-eye extractions; proper selection of cases; avoidance of haste and excessive pressure; inhibition of the orbicularis and other extrinsic ocular muscles, indiscriminate use of the speculum, etc., etc. Smith had 6.8 per cent. in 2,616 extractions and has since reduced this. Birdwood, 35 per cent. in 311. Maynard, 38.28 per cent. in 175. Oxley, 35 per cent. in 80. Knapp had 13 escapes in 104. Drake-Brockman (doing Pagenstecher's operation), 28.67 per cent. in 293. My own results work out at 10.50 per cent. in 811 without selection, less with selection, and 6 per cent. in immature cataracts. Smith tells me that some of his recent visitors have done 3 to 400 extractions with a little over 5 per cent. escapes. Against this, in the capsulotomy operation, Elliot gives 27 per cent., Maynard 4.3 per cent., Herbert 3 per cent., and my own 3.75 per cent. Glancing at these figures it is apparent that the escapes "are" more frequent in Intracapsular extraction. In my first 100 operations I had 22 per cent. escapes which shows that it improves with experience.

I have performed over 800 extractions in the capsule, and excepting 9, the other escapes were very small. In this connection I would like to point out to our opponents that the percentages they give do not correctly represent all their escapes, for they do not include those discession operations in which vitreous is incarcerated or hangs out from the needle puncture; this would slightly increase their numbers, especially if discession was performed as frequently as it should be done; moreover, no mention is made of the numerous instances, after a discession, when the vitreous is displaced and occupies the anterior chamber. This condition might suitably be called an escape of vitreous into the anterior chamber, and differs from an ordinary escape only inasmuch that it is likely to raise and not lower tension, for the other evil effects are, practically speaking, common to both varieties of escapes."

Assistant-Surgeon KEDARNATH BHANDARI, of Auntzar, who with an experience of having done or assisted at over 9,000 cataracts may be considered to speak with authority. The following extract is of interest.

"The patient should be kept in a room with a dull light as it is very difficult to exclude strong tropical light from an eye by dressings. He should rest on his back for the first 24 hours. For the following three days he may rest on his back or on either side according to what he finds most convenient. After four days he may be allowed to sit up in bed. He should have no food or drink for the first 6 or 8 hours after operation so as to avoid the slightest provocation to vomit. For a few hours after operation patients do not seem to digest food or fluid put in their stomachs and when such food is there for a short time nature seems disposed to get rid of it by vomiting. Such vomiting may cause detachment of the Choroid which is accompanied by bleeding, generally free and often severe, from the fundus. Indian patients seem to do best on a diet of rice and milk for the first three days, after which they may be allowed their usual food. The food should never be rich and should not contain hot spices. The tobacco smoker should have his smoke in moderation and the opium eater should be allowed his ordinary ration of opium. The bowels should be kept regular and easy throughout, and if they have not been regular, an Enema of 4 drachms of Glycerine the morning after operation or subsequently will give him an easy free motion. Our practice at Jullundur in recent years has been to give every full-blooded or corpulent person as well as those suffering from Gout or Diabetes, 5 grains of Blue pill at bed-time on the day of operation to be followed by a Siedlitz powder early the following morning. This clears out his bowels without straining and without purging and as a laxative I regard it as the best. His bowels should never be allowed to get into such a condition as causes him to strain at stool. Any irregularity of the bowels in the way of constipation is at once reflected on the eye, and when such does occur, there is nothing more marked than the rapidity with which it disappears after the operation of Blue pill 5 grs. and a Siedlitz powder."

The rest of the paper is very good and the remarks on after-treatment, iritis, inspection of the eye, occluded pupil, prolapse, suppuration, and the rare complication detachment of retina are all good and practical.

Hospital Assistant MATRA DAS, of Mogha, gives his experience of **Operations after Smith's Method**. We quote the following:—

"To illustrate this paper I take my last 162 cases, *i.e.*, the cases I did since my return from Jullundur; in these 162 cases I lost two from detachment of the choroid with free bleeding which occurred a few hours after operation associated with vomiting and in one the lens slipped back and I could not get it out. I used the spoon to lift it

out but could not get hold of it, the wound healed up but there was no vision probably from detachment of the retina from undue meddling with the spoon; for these 162 cases there was slight escape of vitreous in 14, of which 12 did splendidly, the above case had no vision and another case of vitreous escape had poor vision from haziness of the cornea due to keratitis following the operation. Thus 158 out of the 162 had splendid vision and 4 were failures, making a percentage of first class vision in about 97.50 per cent. How does this compare with the old operation with its average of 86 per cent. of favourable results in my hands. In these 162 cases I had no suppuration and no case of iritis.

"I hold that the operation has all the advantages over the old operation which Major Smith claims for it and that it is destined to be the operation of the future. At the same time there is no denying the fact that it is an incomparably more difficult operation to perform, and that for a beginner it is a great advantage to have a few weeks training in the art under a man who can do it properly; such will save him an immense deal of worry and dissatisfaction with himself before he becomes competent."

We quote the following from Capt. Lister's paper:—

VISION OF CASES.

"Tables will be found at the end of the paper giving the exact vision of each case, with one exception, in which by an oversight I forgot to note it at the time of examination. It may be wondered why the vision of the cases in table "A" do not quite correspond with those in table "B," being in the form shown chiefly as $\frac{6}{5}$, the answer is that at first I did not test a patient further if he had a vision of $\frac{6}{5}$. Later when I found what excellent vision they had, I endeavoured to estimate it exactly. It will be noted that the average standard of vision is very high indeed, thus in 61 cases in which there was no opacity of the cornea, capsule left behind or disease of the fundus will be found that the vision was as follows:—

$$\frac{6}{3} = 4, \frac{6}{3.5} = 6, \frac{6}{4} = 4, \frac{6}{4.5} = 5.$$

$$\frac{6}{5} = 4, \frac{6}{6} = 3, \frac{6}{8} = 2, \frac{6}{9} = 3.$$

I may remark here that I find in India owing to, I think, the better light and clearer atmosphere, the patients who come to me for examination usually read a line or two more of the Snellen's test types than they do in England. I find very many British soldiers read $\frac{6}{3.5}$ quite readily. This may account to a certain extent for the excellent vision of these cases, but it is not the chief reason which is the absence of an after-cataract, leaving a perfectly free pupil, and also the low degree of astigmatism. An important question is, does the amount of vitreous lost exercise a marked effect on the vision obtained by the patient. The figures

at my disposal are too small to admit of any definite conclusion, but they indicate, as far as they go, that it does not have any marked influence. Reference to the tables shows it does not appear to have any marked influence. Thus we find in five cases in which the largest amount of vitreous is lost, the vision was :—

$$\frac{6}{3}, \frac{6}{5}, \frac{6}{6}, \frac{6}{6} \text{ and } \frac{6}{9}$$

Taking six cases classed as Trace and Slight in which an average of double the amount of vitreous was lost as in these cases we find the

vision to be $\frac{6}{3}, \frac{6}{3.5}, \frac{6}{5}, \frac{6}{6}, \frac{6}{8}, \frac{6}{9}$. The number

of cases is far too small to be conclusive, but they are sufficiently striking to point out the need of further investigation on this point. Thus it does not appear from these cases that the amount of vitreous lost, provided that the eye recovers from the immediate result of the operation, is the important factor in determining the ultimate vision of the patient, that might be expected."

CAPTAIN I. C. S. OXLEY, I.M.S., gave an analysis of the visual results in 100 cases of Smith's "complete" operations, and concluded :—

- (1) The operation is a safe one for the average operator.
- (2) It eliminates the common complication of simple iritis due to cortical remains.
- (3) It eliminates that insidious and dangerous complication, incarceration of capsule.
- (4) A corneal incision without conjunctival flap does not produce excessive astigmatism nor undue liability to infection.
- (5) Late detachment of the retina is not to be feared.
- (6) The final visual results are superior to those obtained by the old operation.

Results as regards Vision.—It is quite impossible to give a statement of the exact vision obtained by every patient operated on in Indian hospitals in the Provinces. At Jullundur owing to deficient accommodation the patients are allowed ordinarily to leave the hospital on the sixth day.

The eye is still weak and cannot tolerate light well enough to allow the vision to be tested at a distance. In Meerut my patients are discharged on the tenth day, but that also is too early to allow their vision to be tested other than roughly. I show the patients' groups of small dots, varying in size from one readily seen, down to one as big as the ordinary full stop in print. They are asked to count these with a +10 D. lens. If they can count down to the last size but one, I am sure from experience their vision will be about $\frac{2}{3}$ when the cornea has settled down. This may not appear very scientific, but it is all one can do, and

it is for all practical purposes sufficient. I have had the opportunity of seeing and testing many cases of my own and of Major Smith's who came back for various reasons, and from an experience which is based on certainly not less than 250 of these cases, I should say that the average vision obtained after this operation, provided the eye was healthy before operation, is $\frac{2}{3}$.

Astigmatism.—I have worked out the refraction of a number of cases and find the resulting astigmatism is usually from +0.75 D. to +1.0 D. To European ideas, this statement of results will appear unsatisfactory, as it has not the usual table, giving the vision obtained by each case. To those, however, who know the East, and that the native of India is as well able to appreciate the value of an operation as the people of other countries, seeing that he judges by the result only, which after all is the essential point to people of any nationality, the fact that in six months and that broken up into two periods through enforced absence, I was able to get 81 people to come forward for operation, will appear as an argument of the first importance. It should be mentioned that this was in a small Cantonment hospital, where no eye work at all had been done in the preceding year, and that all around are found in every station, operators for cataract by the ordinary method of wide experience....."

Next to Cataract the subject on which we surgeons in India can teach the world is the removal of **Stone in the Bladder**, and on this subject we had a good brief practical paper from SURGEON-GENERAL H. W. STEVENSON, whose experience when Civil Surgeon of Hyderabad, Sind, was second to none. His paper only deals with **Perineal Litholapaxy**, an operation introduced by Lieutenant-Colonel Keith, I.M.S. (*ret'd.*), late of Hyderabad, and practised by Colonel Hume Henderson, I.M.S., and many other stone operators.

We make the following extracts from Surgeon, General Stevenson's paper:—

There are two classes of cases in which this procedure may be called for. Firstly, adult males suffering from stricture of the urethra combined with stone; and secondly, boys.

In the first class the operation has the advantage that it may be utilized for the cure of the stricture, as well as the removal of the stone. It is, however, with regard to its usefulness in the case of boys that it is particularly brought to your notice in this paper.

All surgeons who have much experience of operations for stone meet with a considerable number of cases in which, either because of narrowness of the urethral canal, or on account of the size, or extreme hardness of the calculus, no instrument sufficiently powerful to effectively deal with the stone can be passed through the urethra into the bladder. These are particularly met with in young boys. In these cases the question which the surgeon has to decide is—which is the best operation to perform, taking into consideration

all risks, both of the operation itself, and the after-treatment? No doubt the majority of surgeons would decide in favour of some form of Lithotomy. It is probable, however, that many would change this opinion had they more experience of Perineal Litholapaxy. In young boys it will be found to be an operation of much value. Lateral Lithotomy in boys is a very successful operation, so is Lithotomy by the supra-pubic method, but both these operations necessarily involve considerable shock, and more or less prolonged after-treatment. From these drawbacks Perineal Litholapaxy is to a great extent free. If carefully performed, it entails scarcely more shock than an ordinary Litholapaxy, and the small wound heals rapidly and requires practically no after-treatment. It must be understood that the operation should only be had resort to in those cases in which the stone is of such a size that it can be crushed and removed. Rare cases do occur in which the stone is too large to be treated by Litholapaxy at all. These must perforce be treated by Lithotomy.

The Details of the Operation to which attention must be given are—

1st.—Complete anæsthesia. Any straining on the part of the patient renders the operation much more difficult.

2nd.—No larger incision than is absolutely necessary should be made.

3rd.—Preliminary dilatation of the urethra before attempting to introduce the lithotrite. This must be carried out with all gentleness. The dilatation should be sufficient to allow the lithotrite to pass easily.

4th.—Never leave the urethra without a guide into the bladder. If the track is once lost it may be exceedingly difficult to find it again. It may sometimes be found again by passing the lithotomy staff, or by passing the probe through the perineal wound, but if this cannot be done easily and with little delay, it is better to abandon the operation and allow the wound to heal up rather than run the risk of opening up the cellular tissue round the neck of the bladder.

5th.—Crushing must not be carried on in an empty bladder. It is sure to lead to bruising and injury of the walls, and probably to clogging of the lithotrite.

6th.—If after crushing and washing out, a small fragment still remains in the bladder, it may often be removed with the dressing forceps. A few words of warning may here be given regarding the use of the ordinary evacuator in all cases of Litholapaxy in young children. At Hyderabad, Sind, where a large number of these cases are operated on annually, the evacuator is rarely used as it is found that it is perfectly feasible to clear out the bladder without it. Attention to this fact was first drawn by Brigade-Surgeon Lieut.-Colonel Keith, I.M.S., who was formerly Civil Surgeon of Hyderabad, and a brilliant operator. He showed that with an ordinary four ounce syringe to inject warm Boric lotion through the cannula, aided by manipulation of the cannula itself,

and pressure, as required above the pubis on to the bladder, that viscus could be effectively washed out. This has since remained the practice at Hyderabad, and is most successful. It merely requires a little patience and practice. The use of the ordinary evacuator in the small bladders of these little children is by no means free from danger and owing to the small size of the cannula necessarily used, is frequently very ineffective in removing debris.

The importance of the subject and the authority of the writer will make the following extract of interest. It is from the veteran pioneer of litholapaxy in children, DR. D. F. KEEGAN, I.M.S. (RETD.), F.R.C.S.

Litholapaxy being unquestionably the best operation for the vast majority of cases of vesical stone in old and young patients of both sexes, what is the best operation to adopt in those cases in which it is not feasible by reason either of the great size or excessive hardness of a stone?

Personally, I lean to the opinion that the answer to this question will be found in some form of perineal lithotomy, and not in supra-pubic lithotomy. In the *Indian Medical Gazette* for January 1901, I pleaded for the efficient registration of all operations for stone in the bladder in India in order to solve this problem; but I pleaded in vain, and we are to-day as far off as we were then from a satisfactory solution of the problem. I appeal once again, and I ask the Director-General of the Indian Medical Department to kindly issue instructions that all cases of stone in the bladder in India should be tabulated for the next two or three years according to age, sex, caste, duration of disease, date of operation, time in hospital after operation, weight and composition of stone, nature of operation, and result. We should then have absolutely trustworthy data regarding something like 15,000 cases of stone in the bladder, and the problem would be readily solved, and with its solution many valuable lessons in the treatment of stone in the bladder would be learned.

And now in conclusion I should like to touch very lightly on a subject of great practical importance regarding the future of litholapaxy in India.

The young and inexperienced Surgeon of the Indian Medical Service on landing in this country is, as a general rule, posted for some few years to the medical charge of a Native Regiment, and having a bent for surgery in course of time, selects Civil employment. He is posted to a Civil Hospital in a calculous district, and is at once brought face to face with patients suffering from stone in the bladder. How is he to treat such patients? He can wield a scalpel dexterously; but unfortunately has no practical familiarity with the use of the lithotrite, and during the six or seven years he has been studying medicine and surgery may have never enjoyed an opportunity of seeing a stone in the bladder crushed by an expert. For

we all know that even on the staffs of all the large hospitals in London put together, there are very few surgeons who can crush a stone in the bladder with precision and dexterity. And the young surgeon may never have attended at a hospital specially devoted to urinary diseases. He is therefore inclined to do a cutting operation, be it a suprapubic or a lateral lithotomy instead of a crushing operation, and if at starting, he achieves a fair success in lithotomy he may never during the rest of his career in India take kindly to litholapaxy, and as a result his patients are bound to suffer in the long run. What is the remedy for this state of things? It is a very simple one indeed. Prior to his being definitely posted to the calculous district, the Inspector-General of Civil Hospitals under whom he is about to serve should send him for a couple of months to receive practical instruction in litholapaxy at the hands of a past master in the craft of crushing calculi. If his lines are cast in the Bombay Presidency he should for choice be sent to Hyderabad, Sind, where he would learn more practical knowledge regarding litholapaxy in a few months than in a year spent elsewhere. If he is to serve in the Punjab, a few months spent at the Civil Hospitals of Mooltan, Jullundur or Lahore, will teach him much and give him confidence. And now, Mr. President, I beg to thank you once again for the honour conferred on me.

Another excellent paper on **Stone Operation** was by LT.-COL. P. DURRELL PANK, I.M.S., of Jaipur, based on a series of 416 operations done at the Mayo Hospital there.

383	were done by	Litholapaxy	with 10 deaths	and a mortality of 2.6 per cent.
11	„ „	Perinæal Lithotripsy	with no deaths.	
19	„ „	Lateral Lithotomy	with 3 deaths and a mortality of 15.7 per cent.	
3	„ „	Supra-pubic Lithotomy	with one death and a mortality of 33.3 per cent.	

The following remarks are the result of my **Experience in Litholapaxy** :—

The surgeon should be very careful not to use any lithotrite or cannula which does not traverse the urethral canal fairly easily and never to use force when passing or withdrawing any instrument : more soap or oil or a smaller instrument will ensure easy passage of the instrument.

Some bladders will tolerate or hold very little or no fluid, or resist the injection so strongly as to reject what is introduced with such force as to perceptibly raise the column of water in the tube and in the douche hanging four feet above the operation table : the best way to meet this is to give more chloroform and increase the state of anæsthesia.

In an operation of some duration and sometimes after a few minutes' use of the instruments

the lithotrite or cannula will work stiffly, or cling as it were to the urethral wall or require more force to introduce it ; this may be due to the powdered stone acting on the blades of the lithotrite, to a congested or abraded urethra, or to comparative dryness of the latter, and the obvious remedy is more oil and soap and greater gentleness or a smaller instrument.

Bleeding may occur during or after litholapaxy from an irritable inflamed bladder, an enlarged prostate, when the meatus is narrow and intentionally cut, or from injury to the wall of the urethra from the instruments or fragments of stone in the eye of the cannula.

The operation may be rendered difficult from the following causes :—

1. A large stone, which no lithotrite capable of being safely passed by the urethra can grasp ; this is best met by perinæal litholapaxy, perinæal lithotripsy, or lateral lithotomy : some large soft stones can be crushed by first nibbling at them till they are sufficiently reduced in size or enable the lithotrite to thoroughly grip and crush them.

2. A hard stone—there are some black or yellowish brown stones, not too big but too hard to be crushed by an ordinary lithotrite ; they should be crushed by perinæal litholapaxy or lithotripsy.

3. Stricture of the urethra—treat the stricture by dilation or operation and then do an ordinary litholapaxy or do a perinæal litholapaxy or lithotripsy behind the stricture.

4. A very irritable bladder—the best thing to do is to increase the anæsthesia and operate in the ordinary way.

5. An enlarged prostate—this may only mean a longer operation with increased gentleness and care or a supra-pubic lithotomy with removal of prostate by Freyer's operation.

6. A depression behind prostate—an assistant's finger in the rectum raising the floor of the bladder will often meet this difficulty.

7. In my experience sacculated bladders with encysted stones are very rare and are more often met with by young and eager surgeons than by older and more experienced men.

ELEPHANTIASIS.

It is disappointing to see so few papers on an operation so peculiarly one in the hands of surgeons in India, *viz.*, that on **Elephantiasis**. When we remember the very able papers published by the late Lt.-Col. John Maitland, I.M.S., of Madras, by Major J. T. Calvert, I.M.S., then at Cuttack, and by Sir Havelock Charles, in Calcutta, it is surprising that more papers have not appeared. Fortunately, however, Madras has been true to its traditions and we herewith quote an extract from an excellent paper by MAJOR GABBETT, I.M.S., of Madras on the operation for elephantiasis of the scrotum :—

“ *Anæsthesia*.—I strongly recommend the use of spinal injection in these cases. The shock

which may follow the removal of such a large mass is apparently abolished.

Operation.—The patient is placed in the lithotomy position, or the final scrubbing with sterile water and spirit soap followed by antiseptic douching. The operation area is surrounded by dry sterilized towels, taking special care to clip them tightly over the feet.

A three-inch incision is made from the pubes to the opening in the tumour from which the urine escapes. This is rapidly deepened with the scalpel until the fingers can feel and pick up the firm body of the penis sometimes lying as much as two inches deep in the oedematous blubbery tissue. The mass of smegma usually found in the prepuce should be carefully wiped away. The penis is now enucleated as far downwards as possible and to its suspensory ligament above, by the use of the fingers and successive snips of the scissors. A fringe of apparently healthy prepuce will be found which looks as if it might be useful to cover in part of the raw surface of the body of the penis; this fringe should, however, be removed completely, as, if left, it will subsequently form hypertrophied tags and lumps. A sound should now be passed to ascertain the viability of the urethra. There is often troublesome oozing from the neighbourhood of the frænum which is best controlled by under-running with a couple of fine catgut sutures. Any other bleeding points on the penis are stopped if possible by forcipressure—since tying or twisting them would leave knobs which would interfere with the subsequent close fitting of skin grafts. If necessary, the forceps may be left on while the penis is wrapped in a small sterile towel and held up out of the way while the rest of the operation is being completed.

The incision is then prolonged downwards along the raphé sufficiently far to enable the testicles to be enucleated. From each half in turn the testicle and cord is shelled out of the blubbery tissue in which it lies in much the same way as the kidney can be enucleated from the peri-renal fat—chiefly by the use of the fingers. A firm fibrous attachment below may require division with the scissors. Any fragments of tissue adherent to the tunic are stripped away. It is usual to find one or both tunics distended with hydrocele fluid—sometimes to a very large amount. If this is the case, a short incision $1\frac{1}{2}$ —2 inches in length is made near the neck of the pyriform tumour, the fluid evacuated and the testicle everted through the incision. This can be done very rapidly without the division of a single vessel. The collapsed tunic fits closely round the back of the testicle and occupies surprisingly little space—but should it be thickened or unduly redundant, partial or total excision may be resorted to instead of eversion. Excision of the sac necessitates the ligation of bleeding points and occupies very much longer time than eversion. It has the further disadvantage that subsequent oozing from the cut edges of the tunic

will sometimes take place, and distending the flaps lead to much trouble and possible suppuration.

If hæmatocele is present, castration without opening the sac is often the best procedure unless the sac be so thin walled as to permit of eversion like an ordinary hydrocele after evacuation and cleaning as far as possible.”

We quote also extracts from a note on the operation for **Elephantiasis of the leg** by CAPT. BROWNE, I.M.S., General Hospital, Madras :—

“ At first sight this would seem to be a most successful operation, but it must be judged by its results two or three years afterwards.

I have now seen four old cases within three years from the date of operation.

In only one case was the patient at all satisfied with the result. In the other three the operation was a failure, and one patient has since had his leg amputated at his own request because he could not stand the stink from it.

In the first place, the gradual contraction of the enormous scar binds down all the muscles and tendons and makes the leg very stiff and useless. Secondly, there is a tendency to recurrence. The badly nourished skin thickens, cracks and ulcerates and if neglected, a very foul, intractable dermatitis results.

During the periodical attacks of lymphangitis the leg tries to swell, but being bound down by scar tissue cannot do so and the tension causes great pain.

If the operation is ever performed, those cases should be selected which do not suffer from recurrent lymphangitis.

It is wonderful what useful and active members even the largest elephant legs may be in spite of their weight, and from the few after-results I have seen, I do not consider that their usefulness is likely to be increased by operation, while usually it is greatly diminished.

The operation is therefore rarely justifiable.”

OTHER PAPERS.

There were many other papers of great interest, but we cannot find space to give extracts from all. Enough has been quoted to show the valuable amount of material discussed at the Congress and to show that the volume of the transactions of the Bombay Medical Congress will be a book no medical man can afford to be without. We can only here mention a few of the papers which we have not had space to give fuller details of.

SANITATION, ETC.

THERE were several excellent papers read on various phases of **Sanitation in India**.

MAJOR J. W. CORNWALL, I.M.S., discussed the **Disinfection of Native Habitations**. He puts aside as impracticable in India disinfection by

gas or vapours either generated or pumped into a room. He pins his faith on Cyllin and Izal. Boiling is useful but not always applicable; steam disinfection is only possible at large centres. He refers to the permanganating of wells and points out the lamentable want of experimental data or even of good record instances of the utility of this well reputed measure. DR. SORAB C. HORMUSJEE has a paper on the same subject, which contains nothing new. DR. DADACHANJI has several papers of enormous length on **Water Supplies** and the measures necessary for the purity of water. They are interesting compilations and show a wide knowledge of the literature of the subject, but are scarcely of value in a Congress like this.

MR. W. H. MAXWELL, M.INST.C.E., has a good paper on the **Disposal of Sewage** and town refuse which gives an excellent résumé of European work and needs, but is of no particular value as applied to Indian conditions.

DR. N. N. KATRAK deals chiefly with what he calls **Koch's Standard** of 100 microbes per c. c. and discusses its value. We thought this purely arbitrary and quantitative so called standard had long been considered obsolete.

MR. W. J. DIBDIN'S paper on the primary **Treatment of Sewage**, and on the action of a slate bed is of very considerable interest and importance, and gives us his valuable views on subjects on which he is a recognised authority. Dr. Gibbert J. Fowler has a useful paper on observation on the effects of discharging **Septic Tank Sludge** into a tidal estuary, based on experience at Shotley Point on the River Stour.

W. D. SCOTT-MONCRIEFF discusses some recent aspects of the **Sewage Problem**. He concluded by the remarkable statement which we commend to the attention of those interested in the sanitation of the banks of the Hooghly that, "for all practical purposes, the question of river pollution in England in many cases is a matter of sentiment only and not one that can in any way endanger public health. If this had been explained beforehand, it is doubtful if Parliament would ever have passed the Rivers Pollution Acts at any rate in their present form."

Bombay comes in for some rough handling at the hand of Drs. J. J. Cursetji and D. B. Master; a formidable list of hygienic defects is given and the subject is discussed to such an exhaustive length that no ordinary person will ever have the time to read the paper carefully. The remedial measures "briefly capitulated" would occupy a couple of these columns and not content with this lengthy discussion, the same two writers treat us to almost equally lengthy "notes" on the chief defects in sewage disposal in Bombay—will writers not remember that life is too short to read such lengthy articles. Doubtless they are good, but one simply will skip them if so long.

MR. D. S. SHROFF, Medical Inspector of Seamen, discusses the existing regulations for the **Prevention of Seaborne plague** and incidentally discusses other matters.

DR. F. G. CLEMOW has a very interesting article on the **Haj and international Sanitary Conventions** and his account of the adventures of Indian pilgrims to Mecca and the various ways of avoiding payment of the dues at Cameran is interesting. He considers it necessary that the Indian Government should revive the measure for five days quarantine before the pilgrims leave the shores of India.

DR. J. C. THRESH has a valuable paper on **Water Supplies**, but it has only a general application to India.

Another paper on the disinfection of plague-infected houses by chemicals and by heat was of considerable interest. It is shown that Izal (1 in 100) does not completely kill off fleas in houses with mud wall and floors, and two other experiments show that fleas are not killed even at a heat of 60° C.

It is also shown that in native houses where cowdung and water is daily used on the floors the chances of fleas living a long time is great. This is an excellent argument against what is known in Northern India as "leeping" floors.

LIEUTENANT-COLONEL W. BEEVOR, R.A.M.C., writes a practical note on **Disposal of refuse in Hill Stations**, and comments upon the number of incinerators which men are pleased to say they have 'invented.' Colonel Beevor also unhesitatingly condemns the arrangements for supply of milk and butter at Dalhousie.

DR. J. A. TURNER, the Bombay Health Officer, discussed the big subject of **Sanitation in India**. The paper is certainly a good one and deserves study, but it is too long to abstract here.

CAPTAIN HUTCHINSON, M.B., D.P.H., D.T.M. & H. (Camb.), read two excellent papers—one in co-operation with CAPTAIN NORMAN WHITE, I.M.S., on an outbreak of **Piroplasmiasis** in the Belgaum Vaccine Department, and a very valuable and interesting paper on the preparation and distribution of **Calf Vaccine in the Tropics**. The deterioration of vaccine in capillary tubes and also in phials is emphasised. This is a paper which deserves the attention of all medical men in India.

We quote the following extract on the purification of vaccine:—

"**Two Forms of Calf Vaccine** are prepared: glycerinated calf vaccine and glycerinated calf vaccine after the passage of chloroform vapour. Owing to defective storage arrangements only a comparatively small amount of glycerinated vaccine can be stored for the time requisite for purification; for this reason the majority of vaccine issued has up to date been subjected to the passage of chloroform vapour.

The process as carried out in Belgaum differs slightly from that recommended by Dr. A. B. Green, adverse results due in large measure to tropical conditions have suggested a few modifications. A photograph of the plant used is attached (Plate II). The cool chamber for the tubes of vaccine can be made out of kerosine oil tins at small cost; it is surrounded on three sides by a water jacket, the water in which is cooled by ice or freezing mixture; the front is closed by a sliding glass door. The temperature of the air in the chamber is kept at 18°C., while chloroform vapour is being passed through the vaccine. The blowing away of the excess vapour takes some hours and it has proved advantageous to reduce the temperature in the chamber with freezing mixture to from 10° to 12°C. During certain months of the year room temperature is from 28° to 35°C. So an attempt has been made to reduce the temperature of the air drawn through the plant by causing the air to pass through coils surrounded by cold water or freezing mixture according to the air temperature. The chloroform bottle itself is placed in a cool chamber. During hot weather stock chloroform is kept in an ice chest. Chloroform vapour is passed through the emulsions for 2 hours in the monsoon, and for 2½ or 3 hours in the dry weather. If every detail is carefully attended to, this is sufficient in nearly every case to produce a sterile vaccine. In the few cases in which some colonies of nonspore forming bacteria remain, purification is effected by glycerine after storage for 7—14 days. It is seldom necessary to subject the vaccine to a further passage of chloroform vapour. It will be noticed that the practice is to pass chloroform vapour through a glycerinated emulsion, and not as Dr. Green has more recently recommended, through an emulsion of vaccine pulp in distilled water, with subsequent glycerinisation. Both methods have been tried side by side; there can be no doubt that the earlier method is by far the simpler, and so far as the Belgaum experience goes, is as efficient as the later method. The whole question of the relative value of glycerinated and chloroformed glycerinated vaccine for use in the tropics is of great importance, and one naturally open to two opinions. The two vaccines have been extensively tried at Belgaum, and a final opinion is not at present possible. Figures prove nothing, but it would appear that, taken as a whole, the vesicles resulting from the use of glycerinated vaccine are better in quality, both on the calf and on the child, than those resulting from the same strain of vaccine after subjection to chloroform vapour. The objection to glycerinated vaccine is that purification is very slow, especially at the low temperature requisite for maintaining the potency of vaccine during storage. It is probable that the use of chloroform vapour in the tropics will, provided proper arrangements for cold storage are made, be best confined to a partial initial purification at present effected by storing glycerinated vaccine at 15°C. for seven days.

NAVAL HYGIENE.

FLEET SURGEON F. H. A. CLAYTON, M.D., R.N., contributed an interesting and useful paper on the incidence of **Tropical Diseases among naval men** stationed in warm climates. He discusses disease conveyed by mosquitoes, *e.g.*, malaria. It appears that mosquitoes are rare on ships moored over a quarter of a mile from land and plentiful when moored close to the quay as at Calcutta or Rangoon. The rarity of **Filariasis** among sailors in ships in ports where the carrier mosquitoes abound is another argument which make it not certain that there is not some other factor, which will account for the much greater liability of natives to this infection.

Filariasis.—The plan of Colombo dock shows that there were several carriers of filariæ (I found 6 infected out of 26), habitually on duty close to the dock at night and also that all the mosquitoes bred out and caught there proved to be *C. Fatigans*. There seems accordingly a distinct possibility that mosquitoes may have been present in which filarial embryos had undergone their cycle of development, and as a large proportion of the men were entirely unprotected and severely attacked by them for six weeks that this would seem to offer a good opportunity for infection. An isolated observation of this sort has small value where the evidence it affords is negative, but the 121 men exposed during the entire period were examined sometimes subsequently and none were found to harbour filariæ. The chief interest of the matter lies, however, in the fact that the docking of ships amid filariated populations is a comparatively common occurrence and that many naval men, especially in times past, spent long periods in stationary ships, up rivers, and in-shore appointments where they were correspondingly exposed and yet, so far as I know, filariasis is practically unknown. At all events Fleet Surgeon Bassett-Smith gives evidence as to the rarity of its manifestations and in many hundreds of films examined at night, I have never once met with it, while the history of the 121 men referred to, as shown in Table I, shows that they are fairly representative of the Navy as a whole.

TABLE I.

Showing the length of service, etc., of the 121 men examined for *Filariasis*.

Length of Service.					
Under 5 years	...	...	...	...	26
5 to 9 "	...	...	...	...	46
10 to 15 "	...	...	...	...	38
15 to 20 "	...	...	...	...	7
Over 20 "	...	...	...	...	4
Total					121

Number of foreign commissions served.

Only in the <i>Hyacinth</i>	26
One other foreign commission	31
3 or 4 " "	47
Numerous " "	17

Although one must recognise that the life-history of the parasite as well as the weight of authority favour the view that infection is carried by the mosquito, the disproportionate liability of Europeans (at all events those not permanently resident) and natives has always seemed a weak link in the chain of evidence connecting it with the actual bite. A notable contrast is provided by that unquestionably mosquito-borne disease-malaria, a contrast all the more marked on account of the prevalence of filariæ-carrying mosquitoes as compared with the limited numbers of anopheles.

In view of the alleged connection between or identity of Dengue with "seven-day fever" the following extract is of interest:—

Dengue:—A study of the occurrence of Dengue in recent years brings out the following points:—

Notwithstanding the fairly frequent presence of ships in ports where epidemics are raging ashore, outbreaks are comparatively rare, and not infrequently isolated cases occur without spreading.

For instance, on leaving Hongkong, where the disease was prevalent ashore, in 1904, four cases occurred in my ship. I was myself one of those attacked and had just returned from two or three days in hospital where several cases were under treatment, and I was much bitten by mosquitoes.

Further, it is seen that the ships chiefly affected are either stationary ships (possibly from their permanent stay in centres of infection), or small vessels, as for instance in the epidemics of 1902-3 at Hongkong and Bermuda where the guardships suffered by far the most severely. If the larger sea-going ships are involved, it usually follows a stay in a river port where the ship is alongside or anchored close to the shore. Instances are to be found in outbreaks in the *Eclipse* in 1898 after a stay at Karachi, in the *Mildura* in 1905 after a stay at Brisbane and several others. Again, it has been noted that other ships, notwithstanding unrestricted intercourse, very often escape. These facts all offer evidence in support of the mosquito theory of infection and the peculiarities in behaviour of seven-day fever, which is in my opinion identical with the form of dengue described by Craig and Ashburn in the Philippines, point in the same direction. In an outbreak last year it was, as usual, the crew of a ship in dock who suffered; other ships only had isolated cases, mere contact was obviously insufficient, there was no evidence in favour of food infection, and other features were suggestive of a mosquito-borne-disease.

We have not space to make other equally interesting extracts from this valuable paper.

BIOLOGICAL PARERS (ANIMAL PARASITES, LEPROSY, etc).

FROM the fact that CAPTAIN E. D. W. GREIG, I.M.S., is known to have done good work in connection with sleeping sickness in Uganda, it was expected that his paper on **Tse-Tse Flies** and **Trypanosomiasis** would be one of special interest and value. The paper commenced by a summary of the results of the Sleeping Sickness Commission to work in Uganda in 1903-4, which established the fact that **Sleeping Sickness** is caused by a species of trypanosome entering into the blood and cerebro-spinal fluid, and that these trypanosomes are transmitted from the sick to the healthy by the bites of a species of Tse-tse fly, the *glossina palpalis*, and by it alone.

There are nine species in the genus *glossina*, of which the *G. palpalis* and *G. morsitans* (which transmits *T. brucei*, the causal agent of Nagana) are best known. This subject was well illustrated by the lantern demonstrations by M. F. M. Howlett, the Imperial Entomologist.

Capt. Greig then described other diseases transmitted by the tse-tse flies, e.g., **Nagana**, which renders thousands of square miles of Africa uninhabitable, "Jinga cattle disease," "Abyssinian fly disease," the mule disease of Uganda. Then follows a full account of the "tse-tse fly disease of man" or sleeping sickness as it is universally called. Capt. Greig gives an admirable summary of the investigations which established the fact of the passage of the Trypanosoma (Gambiense) from the sick to the healthy by means of *G. palpalis*, and there then follows a good description of the ancestral forms and development of the trypanosome. The paper concludes by a note on prevention and on the destruction of the parasite when in the blood fluids of the patient. The paper is a very valuable résumé of all that is known of Sleeping Sickness and is well illustrated by photographs, diagrams, tables and maps.

Another very valuable paper on a kindred subject was that by Capt. R. M. CARTER, I.M.S., of the Pasteur Institute, on the **Role played by Ticks and Biting Flies** in the transmission of various diseases to mammalia. The classification and life history of ticks are clearly and briefly dealt with, and we note that no less than nine species of ticks are known in India. The question of the mode of transmission of the pathogenic trypanosomes by tse-tse and other flies is clearly discussed, and the author thinks that recent work shows that mechanical transmission is probably the only method.

DR. J. T. C. NASH, Medical Officer of Health for Norfolk, gave us a valuable compilation of the facts against the **Non-biting Flies** as carriers of disease, a subject which, long known and understood in India, has only recently been taken up somewhat as a new discovery by some writers at home. Dr. Nash, however, is well acquainted with the literature of the subject

and refers to the two classical cases, of Gaya Jail reported by R. Macrae and Haffkine, and of Burdwan Jail, reported (in these columns) by W. J. Buchanan.

Dr. Nash strongly believes that "the domestic fly is the principal pathogenic agent responsible for the frightful mortality among hand-fed infants by diarrhoea in an epidemic sense." Flies can pollute milk in a few hours in warm weather. Dr. Nash considers that the "harmless" *musca domestica* is responsible for more disease than any of his biting brethren in the insect world.

CAPT. R. M. CARTER, I.M.S., also contributes a valuable article on **Pathogenic Spirochætos** in Mammalia. This class of protozoon is closely allied to the treponemata and the trypanosomes, but they present several type shapes. One spirochæte is very common in the mouth and on teeth, especially in cases of pyorrhœa alveolaris, dysentery and sprue. The following five forms are found in man; it is not certain that they are separate species. 1—*Spirochæta recurrentis*, 2. *S. Carteri*, 3. *S. Rossi*, 4. *S. Duttoni*. 5. *S. Novii*. The name of Vandyke Carter, of the Bombay Medical Service, must always be associated with this work, especially on the parasite of relapsing fever.

Capt. Carter's paper is a very valuable one and gives a complete account of the literature of this new subject.

BERI-BERI.

DR. W. LEONARD BRADDON, a well-known authority on this disease had a valuable paper, giving a full summary of his view on this still mysterious disease.

Dr. Braddon's views will be gathered from the following extracts:—

The cause of beri-beri is an *intoxication*, which may be of every grade of destructiveness, from the imperceptible to the severest, the result of a peculiar and probably specific poison, contained so far as is at present known only in rice, or the products of its digestion, when consumed in a certain state, namely, when it has been exposed for some time subsequent to decortication, so as to become stale.

The evidence of this origin of beri-beri, first fully proved by the writer, includes such facts as the following:—

- (i) In the Malay Peninsula, where beri-beri is so common as to have been called endemic, rice-eaters and non-rice-eaters live side by side and are exposed equally to all external conditions productive of disease. But beri-beri attacks only the rice-eaters: never those who eat no rice.

In the last three decades, there have been treated in the local hospitals, among the rice-eaters, over a quarter of a million cases of beri-beri,

in a population not averaging twice that number. One-fifth of all hospital admissions was for beri-beri. During the same term there have been treated for other disorders, from a much smaller population, as many non-rice-eaters. *Not one of these had beri-beri!*

- (ii) In the same region again, there dwell side by side 300,000 of a race (Chinese) who eat almost exclusively rice of one particular sort, and as many persons of different races (Malays, Tamils and others) who consume equally exclusively rice or rices of other kinds.

Now, of the quarter million of cases of beri-beri mentioned, almost the whole, or to be exact 97½ per cent., have been furnished by the eaters of the first sort of rice, the Chinese; all the other classes of natives the Tamils, Malays, Javanese, Sinhalese, etc., although equal in number to the Chinese, furnished but 1½ per cent. of the cases. The Tamils and Malays are in fact absolutely immune from beri-beri so long as they adhere only to the sorts of rice to which they are generally accustomed. But it happens that there is a margin of individuals who for one reason or another have recourse to the same sort of rice as is consumed by Chinese. Such individuals do not comprise 10 per cent. of the whole. But it is among this small proportion of them that all their cases of beri-beri—the 1½ per cent. not provided by the Chinese—occur.

The RICE used by Chinese may be of any derivation—it is the ordinary white rice of commerce, imported from Siam, Saigon, Burmah, Java, or of local production, decorticated in mills on a large scale, by a process which scours away, together with the husk, all the surface layer of the seed. Coming into consumption at an uncertain date, but nearly always a long while after milling, the various samples of rice used by the Chinese agree only in this: that they are wholly decorticated and always stale.

Malays use rice grown by themselves, which is eaten almost freshly as decorticated, as a little of it is for use by the household, day by day. Being not heavily milled, but only lightly pounded by hand, it often retains much of the inner envelope, and the surface layer of seed-cells, which contain a large part of the total proteids and fat of the seed. Such rice may be termed for convenience "Fresh Rice."

Tamils in this region are fed almost exclusively on rice prepared from the raw grain by a special process. It is soaked for one or more days in water, often till the grain begins to germinate; next it is rapidly steamed so that the husks burst; last it is dried—seldom completely—and the husk, which is now easily separated, is removed by light milling.

The result is a yellowish, semi-translucent, toughened, and perhaps partly malted grain, on which the whole of the inner envelope (the

perisperm) and the surface layer of seed-cells are preserved intact. The writer has given to rice so made the epithet of "cured."

In spite of the enormous number of cases of beri-beri treated in the British Malayan Hospitals—some five or six thousand every year—an unequivocal case has never been recorded in an eater of either fresh, or pure, or of any but stale uncured rice.

That the disease is determined therefore by something in the rice consumed, would appear to be a proposition, for the proof of which there can be no further need of witnesses.

Nevertheless the conclusion afforded by this experience—itself a vast though undesigned experiment carried on over an area, and for a time, and with numbers sufficient to eliminate all possible fallacies of proportion—has been put to the proof again by tests upon a smaller scale with safeguards of sufficient and careful controls.

BERI-BERI AND EPIDEMIC DROPSY.

IT was very appropriate that COL. K. MACLEOD who wrote the first connected description of the epidemic of dropsy in 1877-78 should now give us a paper on his views of a subject which has occupied many pages of the *Indian Medical Gazette* during the two past years.

He gives in tabular form a contrast of the etiology, distribution and symptoms of beri-beri and epidemic dropsy, and though he nowhere expresses a definite opinion, there can be no doubt that he clings to the opinion of most observers and recognises the existence of epidemic dropsy as a distinct disease, and one which only resembles beri-beri in a few important symptoms.

LEPROSY.

SEVERAL good papers were presented on LEPROSY. Among the best was one by CAPT. BEAUCHAMP WILLIAMS, I.M.S., Residency Surgeon, Persian Gulf. Captain Williams has used the remedy known as **Nastin** with success in many cases of his own and his paper is enriched by the inclusion in it of a paper by PROFESSOR DEYCKE, the discoverer of **Nastin**. We make some extracts:—

One point only, and it is the most important one, remains, namely, the fact that streptothrix leproides contains a substance which is capable of exerting an active influence on the leprosy-process or the leprosy-exciter, and that in all probability—in fact it cannot be otherwise, if our views, held hitherto, are correct—this same substance is bound to be present also in the leprosy-bacillus and it is certainly contained in the tubercle-bacillus. It is this substance, its properties and effects which form the subject of the following remarks:—

The starting point of the investigations, undertaken by me in collaboration with my Turkish

Assistant, Dr. Reschad Bey, was the discovery and growing in pure culture of a peculiar, hitherto unknown, micro-organism (called by me *Streptothrix leproides*) which we succeeded in isolating repeatedly from a severe case of tubercular leprosy.

Much has been said and written about my having identified this acid-proof bacterium with the genuine exciter of leprosy. It goes without saying that this never has been the case. On the contrary, I have always from the outset accentuated the fact of its *not being identical* with Hansen's bacillus.

In order to prove the existence of any relations between the streptothrix leproides and the genuine leprosy-exciter, I had, at the time, made inoculation experiments with living culture material, in the first place on that patient from whom the culture was derived; later on, however, on a good number of other sufferers from leprosy. The surprising result of these experiments was a striking improvement in respect of general health and of the leprosy phenomena; it was most pronounced and very remarkable in the first case in which fever, which had been existing for months, disappeared, and the symptoms, some of them very severe, retrogressed in such a manner that after about eight weeks' treatment the patient deemed himself cured and refused to stay in the hospital any longer. But also in the case of other patients the improvement was so remarkable that one could not help becoming impressed with the idea that the culture must contain a substance exerting a favourable influence on the leprosy process. With a view of discovering this active substance, I endeavoured to obtain cultures, in large quantities, of streptothricæ. I succeeded in doing so with unskimmed milk on the surface of which there form in a few weeks massy culture membranes of a splendid orange-red tint, which can easily be removed *in toto*. The membranes collected then were subjected to systematic chemical treatment and the thus obtained fractions were tried regarding their efficacy by experiments, extending over months, on leprosy persons. Enzyme-like or other substances, soluble in water, could be excluded, also albuminous substances; it was found, however, that the active principle must be contained in ether-extract. Ultimately I succeeded by a method of my own, in isolating from the ether-extract (which proved to be a very complex mixture of genuine fat and so-called lipid substances), a well-defined substance which, clinically beyond doubt, had to be regarded as carrier and, indeed, as the *sole carrier*, of the curative effects. This peculiar fatty substance, which I called *Nastin*, is a genuine neutral fat, *i.e.*, the glycerine-ester of a high-molecular fatty acid, and as such, it readily and completely saponifies. It crystallises in the form of beautiful acicular star, and sheaf-like crystals. It melts at a temperature of 48 to 50°C. and, when cooling, forms a hard wax-like mass. Interesting is the fact that it is only the

unchanged Nastin molecule which is effective, the fatty acids, obtained through saponifying Nastin as also their soaps, have lost every therapeutic property.

The result of my researches may be summed up in the short sentence:—Benzoyl-Nastin is an agent which directly acts on leprosy-bacilli. This sentence expresses in comparison with other therapeutic efforts—the advantages and progress of the Nastin-treatment of leprosy; on the other hand, however, it clearly points out the limitations of the treatment.

.....“There are graduations between the extremes; generally, however, medical attendants and patients will be wise in being prepared for a long-continued, I might say, chronic, treatment; in practice I would recommend to give it the character of an intermittent treatment, continued for years, on the lines of antisymphilitic cures.

It goes without saying that nothing bars the way of combining the Nastin-therapy, representing, as it does, a pronounced *general treatment* with *local* treatment of single, more especially persistent, symptoms of leprosy. Although for obvious reasons I have resorted to other therapeutic measures but seldom and as an exception, still I have learned from such a case that under certain circumstances one succeeds, by means of combined internal and surgical treatment, in completely freeing leprosy persons from their symptoms in a surprisingly short time. In the case in question it took only two months.

Taking all in all I think that every medical man who, without prejudice, resorts earnestly and perseveringly to the Nastin-therapy, will become convinced that my method of treatment constitutes a real advance in the treatment and combating of this terrible disease.

In conclusion a number of illustrations may demonstrate what is obtainable in the case of leprosy persons by means of the Nastin-therapy.”

Capt. Williams gives his own experience of many **cases treated by Nastin** and concluded as follows:—

“Cases II, III and IV have been living under worst possible conditions, and these conditions have remained the same during treatment. In fact, in all cases, nothing was done for the first six months, except to administer Nastin. After six months' treatment, when I felt convinced that the Nastin was really exercising a specific effect, I gave general tonics in addition.

The treatment is, as Deycke himself says, essentially one for institutions, at any rate, as far as ignorant patients are concerned. The ordinary outpatient is unlikely to keep up the regular attendance, extending over months, or perhaps years, which the Nastin treatment involves. I believe, however, that we have now a remedy, which, if carefully used, involves no risk to the patient, and which can in most cases arrest the disease. In many cases, especially fresh cases

without coarse lesions, the results will approximate to a cure.

Nastin B is supplied in three strengths by Messrs. Kalle and Co. of Biebrich, Germany, viz.—

Nastin B₀Very weak.
Nastin B₁Medium.
Nastin B₂Very strong.

It is put up in ampoules containing the Nastin and Benzoyl Chloride dissolved in sterilised olive oil. The olive oil and Benzoyl Chloride remain the same in all three, viz., 1 c.c. olive oil with 2 per cent. of Benzoyl Chloride. The variation occurs only in Nastin, and is as follows:—

Nastin B₀ contains .02 per cent. Nastin (.0002 gramme).

Nastin B₁ contains .03 per cent. Nastin (.0005 gramme).

Nastin B₂ contains .2 per cent. Nastin (.0002 gramme).”

PROF. P. G. UNNA, of Hamburg, also contributed a technical paper on the differentiation of living and dead **Bacilli of Leprosy** by double staining. Another interesting paper on leprosy was by DR. D. A. TURKHUD, M.B., late medical officer of the Acworth Leper Asylum, Bombay. In this Dr. Turkhud gave his two years' experience of the use of **X Rays in Leprosy**.

After a year's treatment the local effect produced by the Rays was well marked. The exposed ear in the majority of the cases treated became more or less smaller in size, and darker than the opposite ear. The atrophy of the organ was also accompanied with atrophy of the cutis, as shown by the wrinkled appearance of the skin. This atrophy is a preliminary stage towards cure, for it is similar to the condition produced by the absorption of leprosy infiltration which, in a few instances, is seen to occur spontaneously from unknown causes.

The effect of the treatment on the general condition of the patient, however, was not so apparent, and the improvement, so marked in some of the cases of the previous year, did not appear to have gone on. But it must be remembered that whereas during the second year of the treatment, only the right external ear was exposed to the action of the X-Rays, the whole of the face, the facial bones, and the upper part of the chest were subjected to their action during the year previous.

The reasons why the effects of the second year's treatment were purely local, and not general as in the first year of treatment, are in my opinion as follows:—

First, because the action of the rays was confined only to the ear treated, as the rays could not penetrate further on account of the lead sheet used.

And secondly, because they were unable to reach the nasal cavity in which the lesion of leprosy lies.

There was not a single case of X-rays dermatitis during the second year.

These cases were again shown to a special committee composed of:—

1. Col. H. P. Dimmock, M.D., I.M.S.,
2. Khan Bahadur D. N. H. Choksy, M.D.,
and
3. Capt. W. H. Dickinson, I.M.S.,

who reported as follows:—

“The committee visited the asylum on the 23rd April, 1907, and inspected the patients who had remained under treatment since last year, and compared the result of the X-ray treatment as shown in the photographs through the last two years and the appearances of the patients.

“The treatment during the last year has been entirely confined to the local treatment of the right ear. The committee observe that the local conditions show decided improvement; in most of the cases the ear is smaller and shrivelled; in some the general condition also shows improvement, but in the majority there is no marked general improvement.”

MAJOR F. A. SMITH, I.M.S., and CAPT. E. BISSET, M.B., I.M.S., also contributed a good paper on the bacteriology and treatment of leprosy. The paper gave an account of the literature of the bacteriology of leprosy up to **Prof. Deycke's Discoveries** above recorded. Several cases of treatment by Nastin are reported and the authors conclude as follows:—

With regard to segregation, it is now practically unanimously agreed that leprosy is contagious though only feebly so. The disease, moreover, has in the past proved so intractable and its various symptoms are so repulsive that nothing short of strict segregation can be seriously considered. Treatment even by Benzoyl Nastin is bound to extend over several months. The majority of lepers, during the active period of the disease, are shedding myriads of bacilli from the nose. Strict segregation has in the past proved to be a certain method of preventing the spread of the disease, and it is extremely doubtful if any modified form of isolation would be as efficacious. Amongst our patients, however, there are six in whose nasal secretions repeated examinations have failed to demonstrate any bacilli, though there are signs of previous ulceration of the nasal septum. Some of these have lost all their fingers and toes or have well developed *main-en-griffe*. They have anæsthesia in the arms and legs from the elbows and knees downwards respectively. They occasionally suffer from traumatic ulcers, but we have failed to show that they are discharging bacilli into the outer world. In our opinion these patients are no longer contagious and might with impunity be discharged from the asylum. Moreover, they are liable to become reinforced and on this account we are inclined to advocate a more individual segregation. The duration of the disease in these six cases averages 22 years. In them the disease is probably worn out. That this may occur has been pointed out by many observers.

Possibly stray bacilli exist in the deeper nerves, but as long as they remain there, they cannot be a source of danger to others. In our patients little hardship is being caused by confining them. If discharged, they would certainly infest the roads begging, and exhibiting filthy neglected sores to excite compassion. In other countries, however, the same conditions do not prevail. These patients are suffering from the effects of leprosy—not from leprosy. When by repeated examinations of the nasal secretions no bacilli lepræ can be demonstrated, we think the patient can safely be liberated from segregation. It has been stated (Impey) that purely anæsthetic lepers are not infectious. This we have found not to be the case, as although the majority of our patients are cases of mixed infection, a number are of the purely anæsthetic type and in them also we have proved the presence of bacilli in the nasal secretion.

SNAKE POISONING.

The paper by SIR LAUDER BRUNTON and the paper and lectures with demonstrations by MAJOR F. WALL, I.M.S., were items of exceptional interest. The lantern slide demonstrations of snakes at the *Conversazione* was attended by a large audience. We can only quote the following from Major Wall's paper:—

Permanganate of Potash.—It has for many years been well known that this salt destroys the properties of snake venom when mixed with it in a vessel, and it is a notable fact that though snake venoms vary considerably in their composition, this action of permanganate appears to be equally effective with all. It will neutralize nearly its own weight of venom. The discovery lay with Winter Blyth, I believe, and the observation has been confirmed by Fayrer and many others. Brunton and Fayrer, experimenting with strong solution on animals poisoned by cobra venom, found it disappointing as a therapeutic agent; however, de Lacerda in 1881 experimenting with a 1 per cent. solution upon dogs poisoned by the venom of an American pit viper (*Bothrops jararacussu* vel *Lachesis lanceolatus*) was led to consider it a very valuable remedy, and claimed for it that the neutralization of the poison would take place in the tissues if the salt was injected locally. He found that injections made in from 5 to 10 minutes after the inoculation of venom prevented any further danger, and that even if made some hours after the injury when the toxic effects were apparent, it still gave good results. The poison of the *Bothrops* being much less virulent than that of the cobra probably explains these conflicting results. Richards in 1882 performed nearly a hundred experiments to test its therapeutic efficacy against cobra venom, and came to the following conclusions:—I. Lethal doses of cobra venom mixed with from 1 to 3 decigrammes of permanganate, and then injected produced no symptoms. II.

If the two substances were injected into the same locality independently of one another, the permanganate even 4 minutes after a lethal dose of poisons no symptoms ensued. III. After the development of toxic symptoms the injection of permanganate was useless. IV. Permanganate infected some hours before the venom was useless. V. That to be efficacious the permanganate must come into actual contact with the poison. He says later: "It is in my experience, the best local application we possess. It is not a physiological antidote, but a chemical one." Fayrer supports this opinion, but realises the difficulty that may occur in bringing the two substances into intimate contact in the tissues.

Now it appears to me there is no difficulty in bringing the two substances into intimate relationship in the system if the permanganate is injected into the blood stream instead of into the tissues. As far as I am aware, this has never been done, and I think that exhaustive experiments should be made on the lower animals with a view to determining the efficacy of this agent, administered in this fashion, and fixing a dose.

The outlook seems a promising one from analogy. Antivenene when mixed with the venom, for which it is specific, *in vitro* is known to neutralise it. When injected into the tissues is known to act beneficially if it is not actually curative by this procedure. Lamb, however, showed that where toxic symptoms were manifest, reliance was not to be placed on hypodermic administration, but that intravenous injection offered the best hopes of a favourable result.

Should the intravenous injection of permanganate prove beneficial or curative, the fact that de Lacerda found it neutralised the poison of a viper, and Vincent Richards that it destroyed the virulence of the venom of a colubrine snake, *viz.*, the cobra, makes it appear certain that its curative powers would be active for all snake venoms.

The same arguments that apply to permanganate, one may presume, apply equally well to other agents of the same nature such as the hypochloride of lime, and the chloride of gold which are known to neutralise snake venom *in vitro*.

On a discussion being invited MAJOR LEONARD ROGERS gave further results of treatment of snake-bite by incision and rubbing in of crystals of **Permanganate of Potassium**—Eighteen cases were put under this treatment and with the exception of one who was in a moribund condition at the time he was treated, all recovered. Major Rogers was of opinion that this drug was useful against all kinds of snake-venom and its value required to be more widely recognised than it now was.

MAJOR G. LAMB, in a written note, which was read by Dr. A. Powell, submitted his criticism on Sir Lauder Brunton's paper. In it he stated that Sir Lauder had strongly recommended his method of treatment by permanganate of potassium and for this purpose had devised a small

lancet enclosed in a wooden case, which also contained a receptacle filled with crystals of permanganate of potassium. Major Lamb said that it had been conclusively shown that permanganate of potassium, when brought in contact 'in vitro' with snake venom, destroyed the poison, rendering it innocuous when injected into the animal body. This fact could not be denied. Secondly, in a few experiments made in London by Major Leonard Rogers it was shown that under the conditions of experiment used a certain proportion of animals was saved. But the conditions of experiment were very different to those that obtained in nature. A solution of the poison was injected under the skin by means of a hypodermic syringe, only a small multiple of the minimum lethal dose being employed. Now, it was long ago pointed out by Wall that when a snake bit, the poison was deposited not in the skin itself, but in the areolar tissue beneath, and that as the skin was as a rule freely moveable over the parts below, the fangs might have dragged it away from its proper position before the poison was injected. In this way it happened that the poison was not deposited immediately beneath the punctures. Major Rogers in his experiments, which were made on cats, knew accurately the direction taken by the point of needle and in planning his incisions was able to follow the poison and thus get the permanganate in contact with it. It was, therefore, not surprising that he found the method successful. It was then promised that on his return to India similar experiments would be done, live snakes being used in place of a hypodermic syringe. The publication of the results they still awaited. Thirdly, several cases of snake bite in man had been treated by this method with apparently most happy results. But evidence of this kind must be received with the greatest caution. For the snake might not have been a poisonous one, and if a poisonous one, a lethal dose of venom might not have been injected. Major Lamb said he had known a case of bite from a lizard treated with Calmette's serum and claimed as a success, the symptoms described being those which were observed to follow cobra bite. It was also not uncommon for persons to recover after being bitten by a snake even after symptoms of a grave nature had developed.

It seemed necessary, therefore, again to test experimentally this method of treatment, employing conditions which approached as far as possible to those which would obtain in nature. He had recently done so in the laboratory at Bombay with results which threw much doubt on its efficiency. In these experiments a black spectacled cobra was allowed to bite three monkeys in succession in the lower leg and the process recommended by Sir Lauder Brunton was gone through. But they all died. After giving the details of the experiments, Major Lamb remarked that the conditions of these experiments were most favourable for the success of the treatment, much more favourable than would ever occur in nature.

Still they failed in every case. Major Lamb concluded by saying that the claim put forward for this method of treatment by Sir Lauder Brunton was not likely to be realised in nature, and that as a means of destroying the venom locally much more reliance should be placed on free dissection, followed by swabbing out of the wound with a strong solution of permanganate of potash, as originally recommended by Wall.

MAJOR A. HOOTON gave results of cases treated in Kathiawar and said personally he had very little faith in the application of treatment by permanganate of potash.

DR. A. POWELL emphasised the importance of injecting the serum intravenously instead of hypodermically. He said the serum could be inserted in the vein with a hypodermic syringe with great ease. As regarded the use of permanganate of potash, he thought it had great advantage in the treatment of snake-poisoning. But he thought the instrument recommended to them was not a surgeon's instrument. It would be an excellent thing in the hands of a shikari. It would be much better to use an ordinary penknife or a surgeon's knife. He thought that the first thing that one should do when bitten by a snake was to cut out a good piece of flesh from the part affected, even at the risk of damaging tendons or muscles, and then to use permanganate of potash.

MAJOR ROGERS in referring to the experiments made by Major Lamb on monkeys said, it was purely a matter of doses. He had already given results of the further experiments made, and these showed that out of 18 cases only one, who was in a moribund condition, died.

MYCETOMA.

This was the subject of four excellent papers by PROF. MUSGRAVE, MR. BOCCARRO, DR. SURVEYOR and DR. A. POWELL. We have only

room here for the following quotations from Dr. Boccarro's paper :—

'We are in a position, therefore, to define the malady, and I shall venture to set forth the definition thus: **Mycetoma** is an infective disease caused by the agency of a parasitic vegetable organism, and characterized by the formation of a tumor-like growth as the result of a certain morbid change excited by the parasite primarily in the superficial soft tissues beneath the integument, and subsequently in the deep, soft and hard tissues of the human body.

It will be noted that I have in this definition attributed the causal agency to a single parasite for both types of the disease, and my reasons for doing so will be found discussed in a subsequent part of this paper. And in characterizing it as infective I have anticipated the possibility of the disease being a form of argillosis.

THE DISTRIBUTION OF MYCETOMA IN INDIA.

From the limited materials available on the subject, I have endeavoured to map out roughly the districts where mycetoma is found prevalent in a greater or lesser degree. The accompanying map shows the endemic localities, and it will be apparent from it, at a glance, that the disease extends over a considerable area of this country within districts which, seen from a broad point of view, are in close, if not direct, geographical connection with one another. Moreover, from the fact that the wide tract of country invaded lies in different latitudes, it is clear that neither topographical nor climatal conditions in themselves are factors which favour the development and growth of the fungus. On the other hand, it will be gathered from the following description of the incidence of the disease in India that the general physical features of the affected districts as regards terrestrial humidity and a certain degree of high, but not too high, atmospheric temperature, appear to furnish conditions favourable to the growth of the parasite."

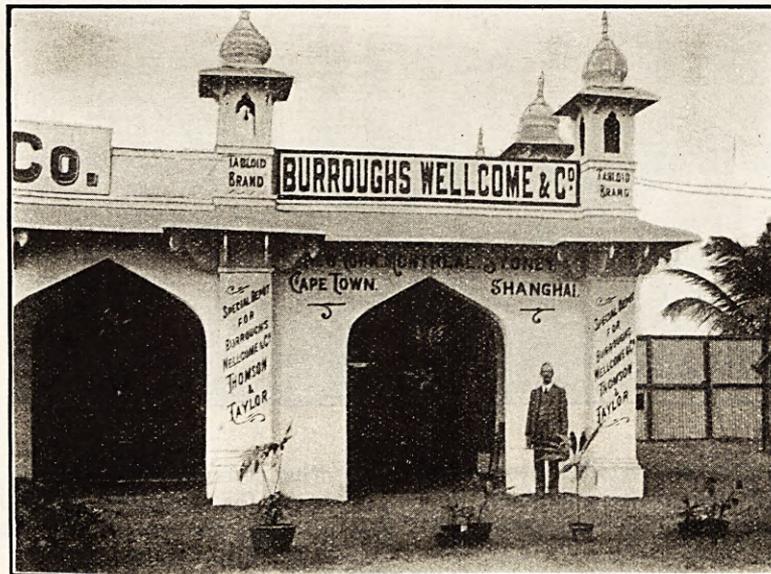


THE COMMERCIAL SIDE OF THE CONGRESS.

As was only to be expected with such an array of the medical profession, the trades that minister to its wants were not backward in taking advantage of the opportunities the Congress presented. The exhibition which was organized by Mr. Charles White, the well-known representative of Messrs. Burgoyne Burbidges & Co., was held on a section of the Bombay maidan. The opportunity to call it the White City could not be lost and so it was called. In truth it was a very white exhibition—so white, that, under the tropical sun, it was rather dazzling.

In anticipation of the show being thrown open to the public, various entrepreneurs had erected stands for popular amusement. In one corner

Turning to the firms exhibiting, the very choice-ly decorated stand belonging to **Messrs. Burroughs & Wellcome** attracted immediate attention. The exhibits showed the neatness and precision for which this well-known corporation is so distinguished. Well to the front of the stand were specimens of the Congo Medical Equipment cases, made of pure aluminium with featherweight unbreakable bottles for the contents. These cases are designed for conditions of active service or exploration, and the thought and care bestowed upon their manufacture and design could not but be noticed in every detail. New designs in First Aid cases were pointed out, some for Motor Car Equipment being specially interesting, as showing the



was the perennial switchback railway. In another was a magic house, the precise meaning of which was not apparent, as on the day we left it was still far from completion. But this appertains to the lighter side of the exhibition. Turning to the left from the main entrance, the exhibits were to be seen dotted all over the grounds, some in kiosques and others in a semi-circular arcade, the monotony of which was broken by an erection in the same oriental style of architecture that distinguished the rest of the exhibition. Under this imposing structure was the exhibit of the St. John's Ambulance Society.

peculiar class of mishaps incidental to motoring which have to be provided for. At **Burroughs & Wellcome's** stand there was a bewildering assortment of their various products—"soloid," "tabloid," etc.—so well known to practitioners. It was interesting to note the first supplies of the new drug "Soamin" were on show at the stall. The representative in charge drew our attention specially to the vaporole hypodermic products. These contain exact quantities of hypodermic drugs in a state of solution and, needless to say, absolutely sterile. The design being of course to obviate any risk of possible danger through

solution of the drug in a dry state in questionable water. An ingenious form of chloroform bottle was also on view. The drug is enclosed in a hermetically sealed flask, the sealing glass of which, when broken, forms a dropper. **Maw Son & Sons**, of 7-12, Aldersgate Street, London, showed a well-selected assortment of the latest medical and surgical instruments made at their own factories in London. Among the very novel and useful articles that they had on view was an exceedingly ingenious set of instruments for minor surgery. The case containing the instruments is a sterilising boiler and the lid forms a tray; the instruments fit into loose lifting trays and the spirit lamp for sterilising cases, for sterilising drugs, needles, silk, etc., all fit symmetrically into the boiler. There is, of course, a waterproof cover. Messrs. Maw Son & Sons' productions are too well known to need much description. All their manufactures were on view,

Arnold & Sons, the Instrument Manufacturers, of Smithfield, London, had a large and interesting exhibit. It appears that their aseptic hospital furniture is now made of a new metal that does not rust or corrode and is not affected by acids; it wears the same colour all through. The representative in charge laid special stress on the high pressure steam steriliser that they are now marketing; it is guaranteed that sterilization takes place not only on the outside, but in the centre; these sterilisers are fitted with Bruce Clarke's kettles. An operating table; known as the "Perfect," was well worth inspection; the arrangements for raising and lowering to suit the height of the operator were exceptionally ingenious and perfect. With a slight pressure of the foot the table could be altered from a fixture to a delightfully easy moving object on ball bearing castors. The absence of machinery in awkward places is a feature of this table, and the operator will appre-



and from the number of interested visitors who seemed to spend their time at this exhibit, the trade in these productions should be in an encouraging state.

Horlick's Malted Milk.—This product was exhibited in the same stand as Maw Son & Sons'. Visitors could obtain a draught of the milk and soda free! This valuable article is now manufactured at Slough, in the County of Bucks. Free samples can always be obtained from W. H. E. Houghton, c/o A. H. Wheeler & Co., Wheeler's Buildings, Bombay.

Southall Bros. & Barclay.—This well-known manufacturing house had a fine display of sanitary specialities and surgical dressings. It is perhaps not very well known that Messrs. Southall Bros. and Barclay are oil manufacturers, and they displayed at their stand specimens of their various brands of cod liver, castor and olive oils.

ciate the convenience of being able to place a receptacle for drainage immediately under the patient, with no obstacle such as turns crews to hinder the free passing of the bucket or other object for collecting the drippings from above.

Burgoyne Burbidge & Co.—This well-known drug house had a kiosque, but no exhibit. Mr. Charles White who is their Eastern representative felt that their goods were too well known to need the aid of exhibition.

Bertie Smith & Co.—Who are agents for the Pasteur Mallie filters, showed an exceedingly nice filter on the Mallie principle, with a covered-in ice chamber for the filtered water. This simple device would greatly minimise any danger of infection as the water is thoroughly cooled without coming into contact with the ice. Every variety of filter was on show, and some

apparatus for sterilising water for large bodies of men excited a good deal of interest.

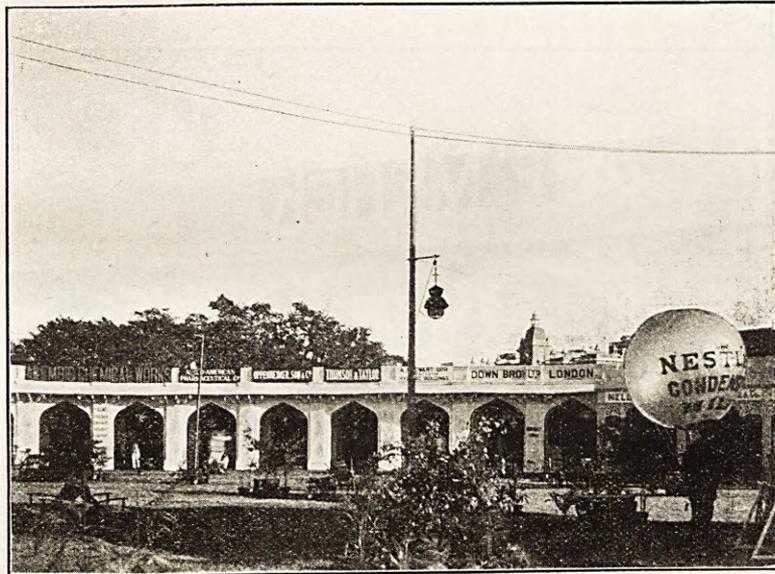
Lawrence & Mayo, the well-known Opticians, of Calcutta, Bombay and Madras, showed lecture lanterns, microscopic dissecting apparatus and microscopes, medical batteries, retinoscopes, ophthalmoscopes and a wide range of other articles. The "Guardian" Clinical Thermometer on which they are specialising is a half minute article which has several good points to commend it.

Treacher & Co., Ltd., Bombay, devoted their space mainly to the display of scientific apparatus of a physical and chemical nature. Among the many and ingenious devices to be seen were Air Pumps, Hand and Motor Driven Centrifuges, Viscometers, Electric Incubators and a new pattern of Ebel's Flash Power Testing Apparatus. There was also Thompson's inge-

ant or the patient himself. The display was unusually complete and reflected great credit upon the Honorary Secretary, Mr. H. G. Clark, St. John's Ambulance Association, Sassoon Institute, Bombay.

Thompson & Taylor, Chemists, Bombay, confined their exhibit to IZAL for which they are Agents. The stand was well decked out with the various products under this well-known brand. Disinfectant liquid and in powder, lozenges, ointment, izal cream, izal tooth powder, etc.

Wm. Cooper & Nephew, Berkhamstead, manufacturers of the well-known sheep dip, had an exhibit at the Congress with a view of displaying their disinfectants, the manufacture of which form a portion of their business. The disinfectants they displayed were Cooper's Fluid Disinfectant, and Vesol, a finer variety of the former for medical use. These disinfectants, as



nious Calorimeter for coal. Messrs. Treacher & Co., Ltd., manufacture standardized liquid extracts and tinctures on their own premises, and samples of all such were on view. Also their own makes of soluble extracts for the manufacture of mineral waters. This was a stand of particular interest to the medical profession, and there were always a number of attendants to explain to visitors the various exhibits.

St. John's Ambulance Association, Bombay, which is also the Store Depôt for India, had a very large exhibit. This naturally comprised everything with which the Association is associated, such as splints, bandages, etc. There were also havresacks and hampers containing first aid necessities. There was exhibited a litter of an improved kind, with removable stretcher, also an ingenious equipoise bed, the angle of which can be altered either by an attend-

far as we know, are new to the Indian market, and great stress is laid upon their efficiency by the makers. It is contended that these disinfectants contain 60% of phenols and are of great value where organic matter is present. The sample shown was absolutely soluble in water and gave a clear opalescent solution. It is contended that Vesol, when used in surgical practice, does not make the instruments slippery and is very clean in use; it makes an almost clear solution. Medical men interested in new disinfectants should write for a prospectus of these preparations. Some rather interesting views on the subject are put forward, and whether they are accepted or not will repay perusal. The Agents are Messrs. Macbeth Bros. & Co., Standard Building, Bombay.

Allen & Hanbury's Ltd., 48, Wigmore Street, London, had an attractive stand on which

were exhibited Hoppes Adjustable Splint, Stacks Portable Dressing Sterilizer, Major Porter's Eucaine Syringe, Brunning's set of instruments for tracheoscopy, bronchoscopy, etc.; sets of eye instruments, Killian's nasal instruments, Mayo Robson's Gall bladder instruments, Moynihan's abdominal instruments; Lane's screws and plate for ununited fractures, high pressure steam sterilizers, appliances and instruments. All distinguished by beautiful finish and the great attention to detail that has always distinguished this well-known house.

Parke, Davis & Co.—The display of Messrs. Parke, Davis & Co., was quite an extensive one, embracing their excellent line of Standardised Liquid Extracts, such well-known Specialities as Solution Adrenalin Chloride, Liquor Sedans, Hematic Hypophosphites, Syrup Trifolium Compound, Cascara Evacuant, Chloretone, Brome-

from the number of medical men and women who visited the stall and examined the preparations, Messrs. Parke, Davis should have laid the keel for a good deal of business during the term of the Congress.

Messrs. Down Brothers & Co., London, displayed a choice collection of Surgical Instruments and Appliances of all kinds and Hospital and Operating Room Furniture.

Kemp & Co, Ltd., The Chemists.—The exhibit consisted of a selection of Pharmaceutical Preparations manufactured by this firm and specimens of various drugs and chemicals. A new form of Galenicals, manufactured without the aid of alcohol, which they call by the special name of "Glycolites," was of interest to those medical men practising amongst patients who have an aversion to alcohol. They equal in strength the usual Liquid Extracts made with



tone, Formidine, Iodalbin, Euthymol, Phosphophora, Taka-Diastase Preparations, Germicidal Soap, Codrenine, Digitalone, Capsolin, Emolientine, Creosoted Emulsion Cod Liver Oil, Pepsin Cordial, Thermofuge, a full line of Palatable Preparations such as Elixirs, Wines, Syrups, also various formulæ; Tablets, Capsules, etc., etc. Great interest was manifested in their display of such new products as Antigonococcic Serum, Lactone Tablets, Analgesic Balm, Sterile Salt Tubes, Fermanganate Disinfectors and a full line of Bacterial Vaccines prepared in the Vaccine Laboratory of the Department of Therapeutical Inoculations, St. Mary's Hospital, London, W., which is under the supervision of the Director, Sir Almoth E. Wright, M.D., F.R.C.S., for the sale of which Vaccines Messrs. Parke, Davis & Co. are the Sole Agents. Their well-known line of certified Antitoxins was also represented. The display was a very creditable one and, judging

alcohol. Tablets of various kinds and their "Chirettones" were in evidence; the latter containing the active principle of the Chiretta plant.

A most interesting feature was the actual making of the Tablets at the Exhibition. Samples were available.

Mellin's Food.—This exhibit consists of specimens of their well-known food; Lacto Glycose, Feeding Bottles, and Mellin's Food Biscuits, with numerous samples and descriptive matter. Also their well-known and valuable book, "The Care of Infants in India."

Watson & Sons, of London, had a display of their excellent microscopes at Messrs. Kemp's stand, and an expert was at hand to display these instruments to those interested.

E. Merck, Darmstadt, exhibited pharmaceutical drugs and special preparations of the

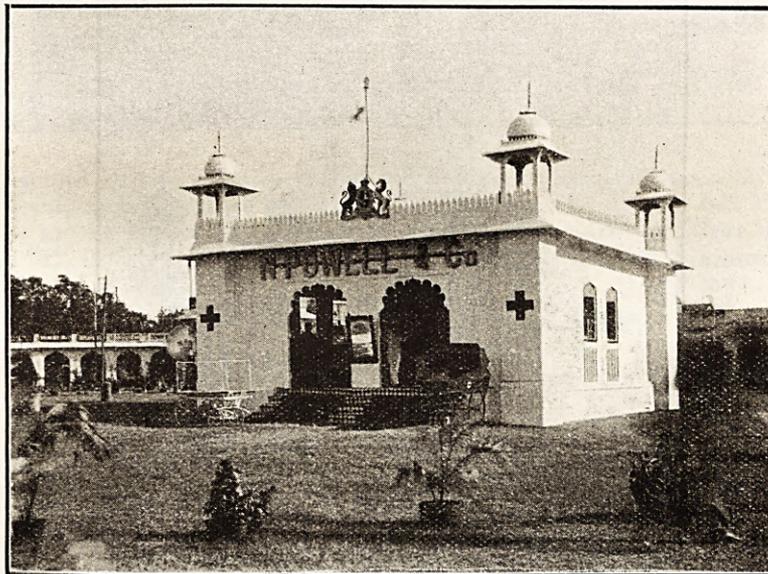
principal drugs in use; reagents, special test solutions for volumetric analysis, solutions for microscopic objects, etc. A curiosity was a huge piece of iodide of potash in crystal, specially manufactured at Mr. Merck's laboratory for display at the Exhibition. Mr. E. Gohner, Fort, Bombay, the agent for Mr. Merck, was in attendance daily.

Messrs. Garlick & Co., Jacob's Circle, Bombay, had a fine collection of Hospital furniture, sinks, baths, post-mortem tables, etc.

Messrs. Thacker & Co. Ltd., Book-Sellers, Bombay, had a stand fitted out for the display and sale of Medical Books. Special consignments had been sent out by various publishers for the special purpose of display at this Exhibition; amongst others Messrs. Lippincott & Co., H. K. Lewis, Baillière, Tindall & Cox, J. and A. Churchill and W. B. Saunders & Co. The times were few and far between when this stand was not visited by interested spectators.

and 5, Palatinoids Quinine Co., Palatinoids Easton's Syrup, Palatinoids Mookavvee, Palatinoids Nesbitt's Specific, Liq. Euonymin et Pepsin Co., Liq. Caullophyllin et Pulsatillæ Co., Liq. Euonymin et Bismuth Co., Liq. Euonymin et Cascara Co., Liq. Helalin et Cascara Co., Ergole, Mushkan, Pulverette Quinine Bisulphate, grs. 1, 2, 3, 4 and 5, Pino-Dyne, Tryp-Tase, Renaglandin, Rhamnine, Dolorino, Bi-Aseptules Anæstiform, Calomel and Mercurial Creams, Liq. Strophunthus.

This exhibit was particularly interesting and Messrs. Oppenheimer's representative was at great pains to point out the therapeutic qualities of the exhibits to visitors. The Bi-Palatinoid method of combining two incompatibles in one capsule, and the method of enclosing a drug in its dry undiluted state into a pulverette was carefully explained and demonstrated. Messrs. Oppenheimer's also put up Mercurial Creams for the Lambkin treatment of syphilis.



Messrs. Oppenheimer, Son & Co.'s exhibit was an interesting one and was presided over personally by their agent, Mr. J. A. Noble. Their exhibits were Cream of Malt, Cream of Malt Cod Liver Oil, Cream of Malt C. L. O. Hypophosphites, Cream of Malt C. L. O. Hypophos et Creosote, Cream of Malt Hypophosphites, Cream of Malt Hypophosphites et Creosote, Cream of Malt with Glycerophosphates of Lime, Soda, Potash, Manganese, Iron, and Quinine, Cream of Malt with Terebene, Cream of Malt with Iodides, Cream of Malt with Parrish's Food, Bi-Palatinoids, Orrefin, Bi-Palatinoids Orrefin with Arsenic, Bi-Palatinoids Orrefin with Arsenic and Nux-Vomica, Bi-Palatinoids Orrefin, Arsenic and Strychnine, Bi-Palatinoids Orrefin, Nux Vomica and Quinine, Bi-Palatinoids Antiphthisis, Palatinoids Quinine Bisulphate, grs. 1, 2, 3, 4

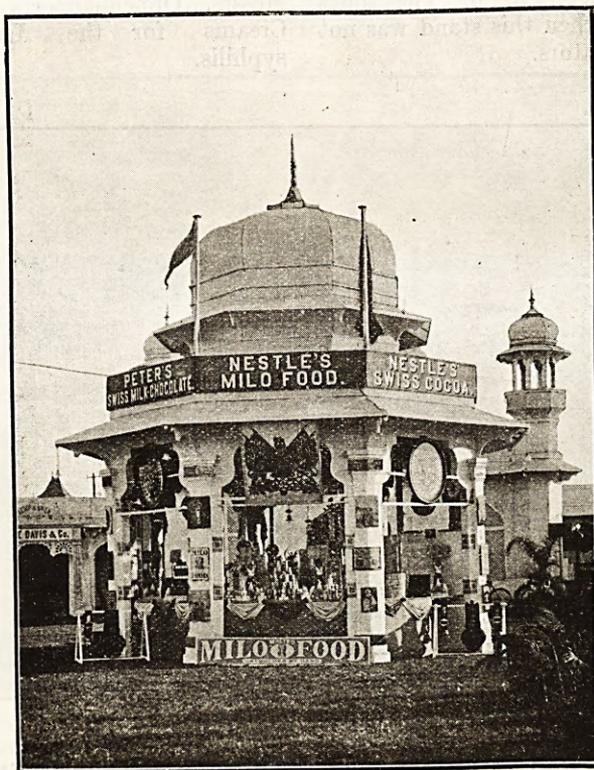
Messrs. Frederick Stearns & Co., Manufacturing Pharmacists, Detroit, Mich., New York, U. S. A., Windsor, Canada and London, England, exhibited under the auspices of Messrs. N. Powell & Co., Wholesale Chemists, Bombay. Samples of specialities from the Stearns' Laboratories were freely distributed amongst medical practitioners, together with literature. Adnephin Solution, a staple and sterile solution of the adrenal active principle, is water white, and remains so indefinitely. It is not injured by freezing, and it may be boiled for a short time without deterioration. "Alphozone" was another special product to which attention was drawn. Alphozone is available in both powder and tablet form, and is one of the most powerful non-poisonous germicides yet brought to notice. It equals mercury bi-chloride germicidally, and is 75 times stronger

than carbolic acid (Phenol). A one in 2,500 solution is said to kill pathogenic bacteria in less than a minute. "Kasagra," "Tritipalm" and "Vibutero" are well-known products, and the former, the firm's special product of Cascara Sagrada, would appear to enjoy a very large sale. "Methyloids" consists of tiny capsoids containing chemically pure methylene blue, santal oil and copaiba, haarlem and cinnamon oils. These greatly interested native medical men. The formula is a happy combination for the treatment of venereal disease and cases where a urinary antiseptic is indicated. The exhibit was in charge of Mr. R. R. Martin and his assistant.

Messrs. N. Powell & Co., Bombay, had their exhibit in a very handsome kiosk, made up as

had a multiplex interest. Messrs. Nestle & Co.'s preparations are so well known that they need little description. The agents, however, asked us specially to mention Nestle's Milk Food and Nestle's Milo Malted Food, and the Milkmaid Brand Evaporated Cream.

The Holborn Surgical Instrument Co., 26, Thavies Inn, London, were represented, and exhibited. Forceps, Dressing Instruments, Scissors, Knives, Needles, Trocars, Aspirators, Syringes, Bone, Skull, Mastoid, Ear, Nasal, Post-nasal Tonsil and Laryngoscopic Instruments; Obstetric, Uterine, Eye and Eye Testing Instruments; Retractors, Anæsthetic and Sterilizing Apparatus, and in fact all the latest things in modern Surgery.



an operating theatre. It was quite a pleasure to see the care and attention to detail that had been displayed in making a good show. The exhibits were Powell's Orthopædic Apparatus, Artificial Limbs, Trusses, Suspenders, Artificial Eyes, Noses, Crutches, Splints, Knee Caps, Electrical Batteries. In fact, every variety of Hospital Stores.

Nestle's Swiss Milk.—This brand of Preserved Milk was exhibited by Messrs. Tothill, Sharp & Co., Bombay, in one of the handsome stands in the Exhibition. It was not only Milk that was exhibited, but Cocoas and Chocolates. Messrs. Nestle's have combined with Peter's and Kohler's, also the Milkmaid Brand people; so the exhibit

The Virol Co., London, were represented, but beyond distributing literature regarding their product, it is difficult to see what they could do in the way of an exhibit. Their stand was most tastefully decorated, and from the point of view of an advertisement must have been a great success.

Messrs. Johnson and Johnson, Manufacturing Chemists, New Brunswick, N. J., U. S. A. This well-known firm of manufacturers exhibited surgical Dressings of every description. Their representative laid stress on the quality of their Absorbent Cotton manufactured from pure raw stock. The makers guarantee that their Absorbent Cotton is surgically clean when removed

from its package. Medicated Antiseptic Dressings were also shown prepared by immersion in a definite solution of the drug and then evaporated. "Lintins" was another product designed as a substitute for gauze, napkins, towels, wool

different kinds of plaster. Z. O. is sold in spools from $\frac{1}{2}$ inch to 4 inches wide, 5 or 10 yards long. It is also sold in strips in double envelopes, the strips being sterilised within the envelopes. "Cantho" is a new form of canthari-



moss, etc. One pound of this substance contains 6,500 square inches area of surface. "Synol" which was shown is an antiseptic soap with a spindle top bottle. If it is what the makers claim, it should be useful in Aseptic Surgery for

dal plaster that produces a blister in from 2 to 4 hours. The agents for Messrs. Johnson & Johnson are Martin & Elgar, Box 112, Bombay.

The Waterbury Chemical Co., of Des Moines, Iowa, U. S. A., showed their preparation



washing the hands. There were two handsome cases filled with "Red Cross Ligatures." The packing of all these articles was particularly good; the utmost care being taken to preserve the contents from contamination. There were several

of Cod Liver Oil, with creosote and guaiacol. This is a new preparation, but the makers claim that it is pre-digested and is an improvement on the ordinary Cod Liver Oil. The Company's advertisement appears in another portion of our columns.