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TYPHOID FEVER

Vol. 34. No. 6

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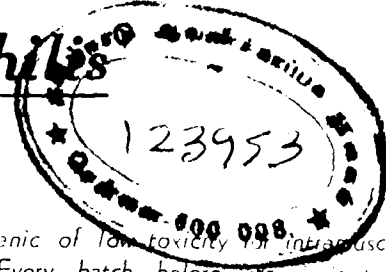
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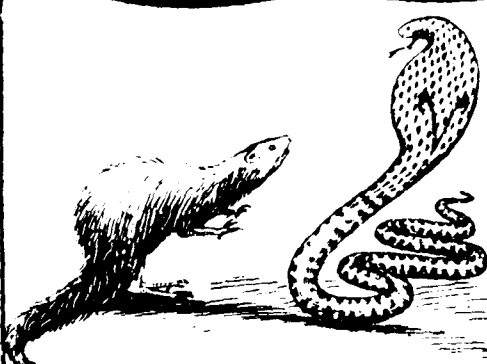
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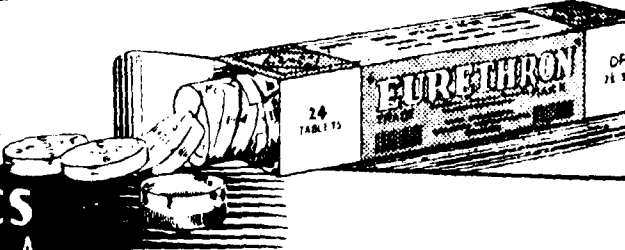


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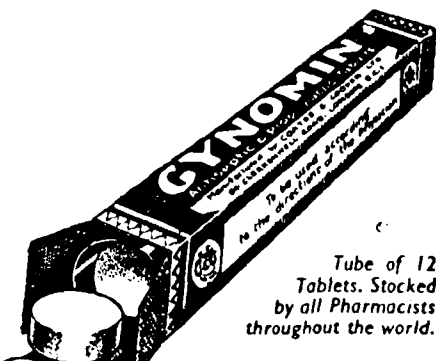
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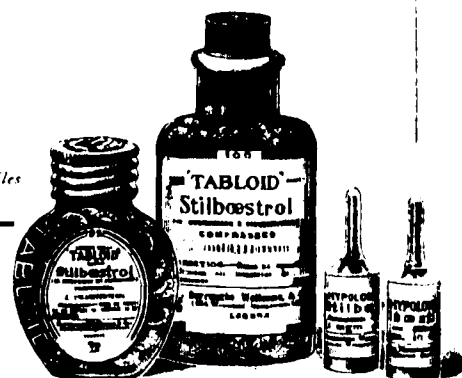
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Typhoid Fever

TERMINOLOGY

The term *enteric fever* is a more comprehensive one than the term *typhoid fever*. The former is intended to designate fevers due to infections with enteric group of organisms viz., B. typhosus, para-typhosus A, B and C, and B. asiaticus. The latter is applied to infection with B. typhosus only. But since the clinical picture is more or less alike, both the terms are used somewhat promiscuously. There is no doubt, however, that typhoid fever is commoner of the enteric group, and its incidence and severity is by far greater than that due to pure infections with para-typhosus A, B and/or C.

IS TYPHOID LESS SEVERE IN INDIANS?

It is said that typhoid fever is less severe in Indians than in Europeans (1). This is too general a statement to carry weight and conviction. At any rate, the mortality figures during epidemic and non-epidemic periods do not bear out this assumption. For example, during the Delhi epidemic in 1935 no less than

588 deaths out of a total of 599 cases were recorded (2). During the epidemic of 1938 in the city of Bombay 507 deaths were recorded out of a total of 1168 cases (3). We recognise that there are factors other than severity of infection that influence the mortality rate. But since high mortality rate and severity of infection usually go together it would not be correct to say that typhoid is comparably a less severe infection in Indians than in Europeans. Comparison in this respect is rather irrelevant, and what we have chiefly to recognise is that typhoid is more likely to run a severe course in at least one in every twenty cases, and that it is a disease which is still a source of anxiety and peril to the unprotected community.

THE IMPORTANCE OF THE CARRIER IN TYPHOID EPIDEMIOLOGY

Notwithstanding substantial public health efforts and achievements in the provincial capitals of our country there yet seems to be no correspondence between such improvements and the incidence of typhoid. The typhoid epidemic has become more or less an annual affair in Madras, Bombay, Calcutta and Delhi. This is obviously due, as Dr. Ghose points out elsewhere, to overlooking the part played by carriers in the dissemination of this disease. It is almost true to say that no typhoid patient in India, be he a hospital or a private patient, is treated up to the point of his being bacteriologically cured. This seems to us a vital point in the epidemiology of typhoid. But the problem of complete treatment of and the search for carriers is one which is easier stated than solved. None the less it may be broadly said that successful prevention depends upon the satisfactory solution of this problem. Till then, protective mass inoculation with T. A. B. vaccine will be a handy weapon against this scourge. The responsibilities of the general practitioners in the matter of treatment and prevention are indeed great. The first responsibility is to notify to the Health Authorities each and every case within their knowledge so that they may be able to trace the source of infection before the epidemic assumes a serious proportion. The second responsibility is to protect the family by T. A. B. inoculation. The third responsibility is to make the patient bacilli-free so that he may not become a reservoir of infection. The complaint of Public Health Authorities that the practitioners are slack in the discharge of these responsibilities seems to be well-founded. It is therefore highly

desirable that there should be a close collaboration between these two important guardians of Public Health, as without this collaboration the incidence of this disease can by no other means be reduced satisfactorily. "There seems little reason to doubt" writes the Public Health Commissioner (2) "that the enteric fevers have a high incidence both in the urban and rural areas of the country, and it is probably correct to say that a considerable percentage of those below 18 years of age have already passed through an attack."

PITFALLS IN CLINICAL DIAGNOSIS

Early diagnosis of typhoid fever based on clinical symptoms alone is rather difficult because of its protean manifestations. Dhayagude (1) gives the following result of autopsies permitted to be performed on 13 fatal out of 228 cases clinically diagnosed as enteric fever and admitted as such in the K. E. M. Hospital, Bombay.

<i>Clinical Diagnosis</i>		<i>Post-mortem Diagnosis</i>
Enteric	...	Malaria
"	...	Lobar pneumonia
Typhoid	...	Typhoid
Enteric	...	Amoebic abscess with myocardial failure
"	...	Typhoid
"	...	Syphilitic meningitis
"	...	Malaria
Typhoid	...	Typhoid
Enteric	...	"
Typhoid	...	Apical pneumonia
Enteric	...	Typhoid
"	...	Lobar pneumonia
Typhoid	...	Apical pneumonia

The results are both interesting and instructive, and show conclusively the common pitfalls in the clinical diagnosis of typhoid fever. Besides, it should also be clearly recognised that enlarged spleen and rose-spots are less relevant and least prominent symptoms of typhoid in our country. The former is practically of no significance in a malarial country like that of ours while the latter is definitely acknowledged to be rare among our people. There is also usually wide variation among the other classical symptoms. In any case, definite symptoms are not established within the first 8 or 10 days of the attack. Therefore the only certain method of early diagnosis is by blood culture and urine examination for Diazo reaction in the first week, and Widal's and Marris Atropine tests subsequently.

THE RELATIVE IMPORTANCE OF LABORATORY TESTS

The particular time at which one or other of these tests are to be employed in arriving at early diagnosis is well brought out and

described elsewhere by Dr. Zaman Khan. It is suffice for us to point out here the importance and significance of Weil-felix modification of Widal's test. In the standard Widal Technique "H" antigens are employed, and in the Weil-felix modifications both the "H" and "O" antigens are used. The advantage in this modified method is that we are able to detect such typhoid infections which have developed only "O" agglutinins, and to this extent improve the accuracy of diagnosis by approximately 10%. (5). Another advantage of testing for "O" agglutinins is that their presence in insufficient titre indicates an active infection, since "H" agglutinins may be produced by prophylactic T. A. B. vaccine or a previous attack of typhoid (4). A titre of 1 in 250 with "O" suspension and 1 in 125 with "H" suspension is definitely diagnostic of typhoid, but it should not be forgotten that the titre rises with the duration of illness, and that the test has to be repeated before final confirmation of the diagnosis (6). Increasing titres may therefore be taken as a sure diagnostic feature of typhoid fever. Recently Felix and Pitt isolated Vi antibodies in rabbits immunised with living cultures of highly virulent organisms of typhoid, and the presence of Vi antibodies is now accepted as an indication of the virulence of infection.

Thus, a triple Widal's test for *B. typhosum* with "H" and "O" emulsions, and para A and B, and possibly also with emulsion sensitive to Vi antibodies, constitute a complete serological method of diagnosis of typhoid.

Other supplementary tests are leucocytic count, urine test for Diazo reaction and Marris-atropine pulse test. Leucopenia and relative increase of lymphocytes are usual in uncomplicated cases, but since each person has a normal count of his own it is difficult to fix the standard level of leucopenia in typhoid (4). The advantage of Diazo reaction is that it is positive between the fifth and tenth days, but this reaction is not constant in all but severe cases. Marris-atropine test is simple but its value is doubted by some.

It may therefore be broadly stated that blood culture and Diazo-reaction are the tests of choice during the first week, and Widal's and Marris-atropine during the second and subsequent weeks of typhoid.

SPECIFIC TREATMENT AND ADEQUATE DIET IN TYPHOID

The treatment of uncomplicated typhoid fever is quite simple, and is directed more or less to the alleviation of distressing symptoms.

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Of the specific treatment none has gained any popularity so far. Typhoid serum, anti-typhoid bacteriophage, and recently sulphonamides have been, and are being, tried. But the results are not very striking, although enthusiastic advocates of each of these methods of specific treatment are not wanting.

Recently much attention has been paid to the need for high calorie value of diet in typhoid. Minchin (7) mentions three groups of cases treated in the Madras General Hospital: one on the time-honoured semi-starvation diet made up of liquids like barley and glucose water with fruit juices; the second on a semi-solid diet of high calorie value with about one ounce of cod-liver oil; and the third on high calorie diet with one drachm of castor oil every morning. He concludes that although the rates of mortality do not differ much between these three groups, yet the group with high calorie diet and castor oil showed least complications. He believes that a gut kept in a state of active peristalsis is far less liable to bleed or perforate than one that is allowed to become clogged with faecal material or distended with gases of putrefaction (8).

There is no doubt that adequate diet in typhoid is more advantageous than the semi-starvation diet usually prescribed by the physicians of the older order. The *Indian Medical Gazette* (1) agrees with this view and puts the requirements of the average Indian male adult suffering from typhoid at 2 to 3 thousand calories, provided the patient is not already starved, when naturally increased calories will be required. But the same cannot be said of Minchin's plan of castor oil treatment although his reasons seem to be quite valid. Until a more extended trial is given, we do not think his suggestion will be easily accepted and practised by the physicians.

CONCLUSION

This symposium aims to give a practical account of typhoid fever without being comprehensive or erudite. We hope that it will be found useful to the practitioners both as a reference and guide in tackling a fever of such long duration and of so many possible complications, severe or slight, as typhoid.

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Blood Culture and Widal Test in the Diagnosis of Enteric Fevers

• Dr. K. S. Ranganathan, M. R. C. S.,
(Eng.), L. R. C. P. (Lond.) King
Institute, Guindy, Madras.

The importance of early diagnosis of enteric fever will be obvious. It enables the adoption of specific measures for the protection of the community, and for the treatment of the patient. Too often, however, the diagnosis is made by a process of elimination after treatment for influenza and malaria has failed.

The responsibility for the diagnosis rests on the physician and whatever help the laboratory gives him must be taken as only one item of evidence to be considered with other items of clinical evidence available.

The course of events during an attack of enteric fever differ with successive weeks. There are different laboratory methods of diagnosis, each one being applicable to a particular stage of the disease. For a proper application of these methods it is essential that one should know the bacteriology of enteric fever.

Enteric fever is associated with a bacteremia from the onset of symptoms. By suitable technique the causative organisms may be isolated from the blood stream in 80 to 90% of cases during the first week. As the disease progresses the chances of isolation from the blood stream gradually diminish. It is believed therefore that it is useless to take a blood culture after the first week. There is no hard and fast rule as to the time when the blood culture should be taken. The causative organism does not disappear from the blood stream on the 8th day of the fever as if to order. There is a fair chance of isolating it as long as the fever is high, i.e., usually till the end of second week, and every endeavour should be made to clinch the diagnosis by blood culture.

With the decline of fever positive blood cultures become rare. We have now to search

- (5) The Value of "H" and "O" ... *Burma Med. Times*, Agglutinins in the Serological Diagnosis of Typhoid Fever Feb. 1940, p. 4.
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elsewhere for the causative organism. It can be isolated from the faeces from the 2nd to 3rd week and less frequently at a later period. It may be isolated from the urine also from the 2nd week onwards. But the bacilli are voided with the urine only rarely, and even then in an intermittent manner. So the urine cultures will have to be repeatedly done.

From the second week onwards the serum of a patient infected with one of the enteric group of organisms causes agglutination of the organism suspended in an emulsion even when the serum is highly diluted. This agglutination is caused by specific substances, agglutinins in the serum, produced as a reaction to the infecting organism. The highest dilution of serum in which such agglutination occurs is known as the "titre" or "end-point" of agglutination. The titre of the patient's serum begins to rise rapidly from the 2nd week onwards, reaches the maximum at the end of 3rd week and then falls, at first rapidly and later on slowly. The agglutinins can be detected in the serum even some months after recovery. The Widal test consists in the detection of agglutinins in the serum of patients suffering from typhoid or paratyphoid fever.

Thus we have four bacteriological methods for the diagnosis of enteric fever, viz., blood culture, Widal test and culture of faeces, and of urine.

There can be no doubt that blood culture is the most valuable method of diagnosis as it provides direct proof of infection long before the other methods could be applied. Nevertheless this method of diagnosis is often neglected.

A blood culture should be taken as soon after the onset of symptoms as possible, preferably during the first week. The technique is important and special precautions must be taken to prevent contamination from the patient's skin or from the atmosphere. The blood is best collected at the height of the day's fever, generally in the evening. One of the prominent veins at the bend of the elbow is selected and the skin over it is sterilised. In children blood may be collected from the great saphenous vein or external jugular vein, if the veins of the arm are not prominent. Puncture of the fontanelle is not recommended on account of its risks. The skin is first cleaned with ether and then with 70% alcohol. After the alcohol has thoroughly evaporated, 5 cc. of blood is withdrawn with a sterilised syringe. The syringe should be dry and contain no trace of any antiseptic. The blood is transferred immediately to a bottle of bile medium, the mouth of the bottle being flamed both

before and after the inoculation of blood. The method of collecting blood into citrate or oxalate, and inoculating it into the medium at leisure is not recommended, as the culture is likely to become contaminated. Citrated blood is useless for culture on account of its alkalinity.

If bile medium is not available 5 cc. of blood may be withdrawn and transferred into a sterile glass capsule and sealed with sealing wax. The blood may then be forwarded to the laboratory with a request for "clot culture". At the laboratory, the clotted blood is transferred aseptically to bile medium. Clinicians are not aware of the large number of "positive cultures" that can be obtained by this simple method.

A lady aged 25 years, developed fever on the third day after a normal confinement. She was treated by her medical attendant for puerperal sepsis for eight days with no improvement. On the 9th day a specimen of blood was recovered for widal test. I tipped the clot into a bottle of ox bile medium after the serum was taken for agglutination test. The Widal reaction was positive in 1:25 against *B. paratyphosum* C. The next day the subculture from the clot culture yielded a pure growth of *B. para* C. The fever continued for 27 days before it reached normal.

Behring's venules are very convenient for collecting blood for culture or Widal or both. A report of the blood culture may be expected after 36 to 48 hours. It may be only a preliminary report stating that organism has been isolated and its identity is being investigated. Usually the preliminary report gives some indication as to the nature of the organism.

Or the report may state that no bacterial growth has been obtained from blood culture. A negative blood culture, as this is called, only means that no organism of the enteric group has been encountered in the blood stream at the time the culture was taken. It does not indicate that the case is not one of enteric fever. On the other hand if the clinical evidence is in favour of enteric fever, further attempts at diagnosis must be made by a repetition of the blood culture or by Widal test after the 7th to 10th day of disease.

The pathologist may find the blood culture contaminated with extraneous organisms in which case the blood culture must be repeated with scrupulous attention to technique.

Widal test: Unlike a positive blood culture, a positive Widal reaction furnishes only indirect proof of infection. It detects the presence of agglutinins in the serum of patients suffering from typhoid or paratyphoid fever. The demonstration of agglutinins is by itself of no significance unless they are present in high dilutions.

As stated already, the Widal test becomes positive in enteric fever after the first week,

the percentage of positives rising to over 90 in the 4th week. So, blood for Widal test must be taken after the 7th to 10th day of fever. At least one cc. of blood is necessary. The blood may be collected from the finger or from the vein. The nail is cut short and the finger cleaned with ether and then with 70% alcohol. When the alcohol has thoroughly dried up the finger is pricked with a sterile surgical cutting needle or a three cornered one, but not a pin. By milking the finger more than one c.c. of blood may be collected into a Wright's capsule. If blood is collected from a vein the precautions mentioned under blood culture should be followed. The capsule is then sealed with sealing wax. Hermetical sealing may char the blood and render it unsuitable for the test on account of haemolysis.

It is very important that every sample of blood sent to the pathologist for Widal test must be accompanied by information on the following points: (1) History of previous enteric fever, if any. (2) History of prophylactic T.A.B. inoculation: if so, when? (3) Day of disease.

The significance of the above information will be discussed later. It is essential to know that the technique of the Widal test may have to be modified in the light of the information furnished.

The interpretation of a Widal reaction needs skill and experience. Recent research on the antigenic structure of the enteric group of organisms has helped only to confuse our ideas of agglutination reactions rather than to clarify them. A brief description of the behaviour of agglutinins will not be out of place.

Agglutinins begin to appear in the serum of a person (who has not had a T.A.B. inoculation) infected with one of the enteric group of organisms at the end of the first week of fever. The titre of the serum therefore starts at zero in the first week and rises rapidly in the 2nd week to reach its peak at the end of the 3rd or 4th week. So a Widal test done early in the first week is usually negative in a 1:25 dilution. After the 4th week the titre falls at first rapidly and later slowly. Agglutinins may be detected in the blood even some months after a natural infection, (i.e.), the agglutinin titre does not come back to zero.

After a protective T.A.B. inoculation also, agglutinins appear in the serum and reach the maximum after three weeks but fall to a certain level, say 1:50 or 1:100, and remain for a long time at that level and get less and less very very gradually.

If the inoculated person has a natural infection the rise in agglutination titre is from a level distinctly above zero. The course of events thereafter is almost the same as in an uninoculated person, maximum after 3 weeks and fall to about the previous level.

The difference between the two curves will be obvious. Whereas in an uninoculated person the curve starts at zero, in the inoculated one it starts at a level higher than zero. So a widal test performed in the initial stages of fever in an inoculated person may yield a doubtful or positive reaction and it will not be possible by means of a single widal test to say whether the positive reaction is due to a natural infection or to residual inoculation agglutinins. Fortunately a natural infection causes a distinct rise in titre in the inoculated as well as uninoculated persons. As a rise in titre is only possible through the presence of and reaction to the infecting organism, it is absolutely diagnostic of enteric infection. A rise in titre can be detected by a second widal test performed 5 or 6 days after the first, the "end-point" of agglutination being determined each time. It is immaterial if the rise is from zero to 1:200 or from 1:100 to 1:500. What really counts is the rise and not the dilution. Thus it will be seen that even a negative widal reaction is of distinct value in assessing the significance of widal tests performed at a later period.

It would be well to remember that there is no particular titre which can be considered diagnostic of enteric fever. However, the higher the dilution the greater the specificity. In practice it is found that a positive in 1:100 is strongly suggestive while 1:200 or over is diagnostic of enteric fever provided the patient has not had a protective inoculation.

The widal reaction may be (1) positive in 1:200 or over. This indicates that agglutinins for the infecting organisms are present in the dilution mentioned. It does not show whether they are due to past or present infection or previous T.A.B. inoculation. If the end-point is high and the individual has not been recently vaccinated, the reaction is strongly suggestive of enteric fever. If a second widal test detects a rise in titre, it is absolutely diagnostic.

(2) Positive in 1:50 or 1:100. This is a doubtful reaction and may indicate (a) enteric infection to which the patient is reacting poorly. (b) The patient has had a T.A.B. inoculation. (c) The patient is suffering from some other infection which has excited a non-agglutinin production. (d) The patient is a typhoid "carrier". To distinguish between these conditions, the patient is questioned about

T.A.B inoculation. A thorough physical examination is made to discover the cause and if there is any non-specific agglutination a "carrier" condition is ruled out after repeated stool cultures. (e) Lastly, the widal test is repeated after an interval of 5 days to determine any change in agglutination titre.

(3) The reaction may be negative in 1:25. This may mean that the patient is not suffering from enteric fever. It may also be due to enteric fever in which agglutinin production is poor. Enteric fever cannot be ruled out on a single negative widal test. The reaction should be repeatedly negative. In some severe cases of enteric fever particularly in fatal ones, the widal reaction may never be positive. In such cases positive blood cultures may be obtained till late in the disease. It may be taken that the earliest time at which agglutinins are appreciably present in the blood marks in the time limit up to which bacteriemia exists.

The value of a negative widal reaction in relation to subsequent widal tests has been already discussed.

(4) Lastly, the widal reaction may be positive against two organisms: *B. typhosum* and one of the paratyphoids. Such a case may be one of mixed infection by two organisms. Typhoid and paratyphoid are antigenically closely related organisms and so when there is an infection by one the agglutinins produced act not only on the specific infecting organism but also on the allied ones. This is a non-specific reaction called "group reaction". Generally the titre for the infecting organism is higher than the "group reaction". A second widal test is again helpful. The "group reaction" is usually short-lived while the titre for the infecting organism shows a rise.

It will be seen that in almost all the doubtful instances discussed above the only certain way of diagnosing enteric infection is by performing a widal test again and noting the change in titre. If the titre is stationary or if it is declining enteric fever is unlikely. A rise in titre usually points to enteric infection. To be able to follow the rise in titre the "end point" of agglutination must be determined every time.

Anomalous agglutination reactions: The agglutination reactions in cases of typhoid fever usually follow the well-known curve. But in cases of infection by paratyphosum A the agglutination reactions are usually anomalous and difficult to interpret. I have studied the agglutination reactions in a number of cases of fever diagnosed as paratyphoid A by positive blood cultures. The widal test was repeated, done three to 4 times,

sometimes after the patient had entered the convalescent stage. At least four different kinds of reactions were obtained.

(1) The widal reaction was completely negative throughout the fever and early convalescence, becoming positive only later on. (2) In other cases, the widal reaction was positive for *B. typhosum* and negative for *B. paratyphoid A*. (3) In others again it was positive for both *B. typhosum* and *B. paratyphosum A* in almost equal titre. (4) Lastly, in a few patients the widal reaction was frankly positive for *B. paratyphoid A* with or without a group reaction for *B. typhosum* in a lower titre.

In general the agglutinin response to *B. paratyphoid A* is both delayed and poor. The titre is never very high as in typhoid fever and therefore a positive reaction in a lower titre such as 1:50 may be diagnostic.

Mention has been made of the anomalous reactions only to show the difficulties in the interpretation of widal reactions and to emphasise the superiority of blood culture for diagnosis. The clinician must be guided chiefly by the clinical signs and symptoms when the widal reaction happens to be inconclusive.

"H" and "O" agglutinins: It is found that the typhoid group of organisms contain two groups of antigens called respectively "H" or flagellar and "O" or somatic antigens differing in their resistance to heat and chemicals. It was believed that agglutinins acting on the "O" antigen appeared only as a result of infection and not after T.A.B. inoculation and that it would be possible to diagnose enteric fever by means of a single widal test even in an inoculated person by using an approximate O antigen. This hope has not been realised.

Both H and O agglutinins are generally found in enteric fever. But it has been shown that some cases may fail to develop one agglutinin while developing the other in a high dilution. So it is found necessary to search for both H and O agglutinins in each sample of blood tested. For the purpose both H and O suspensions are used.

The discovery of H and O antigens has not simplified the widal test. On the other hand the interpretation has been made more complicated as two antigens are used in place of one. Again, unless the agglutination titre is very high, the test has to be repeated to detect a rise in titre.

H agglutinins are usually specific in enteric infections and appear earlier and in a higher dilution than O agglutinins. On the other

Limitations of Serological Tests in Typhoid

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The importance of a serological test like the Widal Reaction in the diagnosis of typhoid fever cannot be over-estimated. The technique of the test and the interpretation of its results, are attended with difficulty to a certain extent even today. While cultures from blood, urine or faeces would give the physician definite information regarding infection with typhoid organisms, a widal result may or may not give him that definite clue to clinch the diagnosis. Yet, in cases where information could be got by this test diagnosis becomes easy. It is this feeling among the practitioners that makes them resort to this test very often. In fact, they are in the habit of asking for this test even at very early stages of the disease when no information could be got. The result is that very often they are faced with negative results which do not help them in any way. Thus many a time the laboratory worker is blamed for not giving the real clue to diagnosis. While positive widal results are very helpful to the physician to a great extent, negative results are making him to the same extent helpless. Hence, though a physician is well advised to resort to

hand O agglutinins are of greater significance in inoculated persons. O agglutinins are of value in diagnosing enteric fever, but H agglutinins are of greater value in distinguishing between one type of infection and another.

The widal reaction is diagnostic of typhoid fever if the H titre is over 1:100 or over 1:200 and the O titre is 1:100 or over. The reaction is perhaps of no significance if H or O agglutination is below 1:50.

Vi Antigen: A new antigenic component Vi antigen is found to be present in strains of *B. typhosum*. It is not yet known whether by employing strains sensitive to Vi antigen in the agglutination test a diagnosis of typhoid fever may be arrived at earlier than by the routine widal test.

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widal test before he ventures on the diagnosis of typhoid, yet too much reliance should not be placed always on its results, as after all the test is dependent upon tissue reaction which itself depends upon various factors in the individual and the causative organisms.

The story of how this test came into existence as a method of diagnosing typhoid and what the original limitations were which gave rise to a chain of discoveries leading up to the present-day opinion regarding the subject is well worth a study.

The discovery of the formation of agglutinins in animals inoculated with typhoid, in the year 1896, by GRUBER AND DURHAM, laid the foundation for the diagnosis of typhoid fever by the agglutination method. Agglutination, as a relatively specific immunological phenomenon in man, was found out by GRUBER AND WIDAL in the same year and what is now known as Widal Reaction came into existence.

The original principle, as enunciated by the earlier workers, has not changed till now though many modifications have been suggested from time to time. The test depends upon the determination of the smallest amount of the patient's serum which is capable of agglutinating typhoid organisms. The familiar macroscopic and microscopic methods of doing the tests are too well known to be discussed here, but the recent modifications and changes in the methods and interpretations of the results are worth consideration.

Antibodies, like the agglutinins, are the results of specific antigen, as we all know. The nature of the antigen that could produce this antibody was not studied in the early years after the discovery of the Widal Reaction. At that time, whatever the nature of the antigen was thought to be, an agglutination with 1 in 80 dilution of the serum was taken to be diagnostic of typhoid. It was also known then that such a positive reaction nearly after a week or two after the onset of the fever was common. The real difficulty of the value of such a result arose in cases where prophylactic inoculations against typhoid had been done, as for example in soldiers. In a case of suspected typhoid fever in a soldier it was difficult for the physician to find out whether the positive result given by the Widal was due to the infection with typhoid organisms or due to the previous inoculations he had undergone. This difficulty was sought to be overcome by doing the widal every fourth day and noting any increase in the agglutinability. In other words, if the blood of the suspected patient was able to agglutinate typhoid bacilli in greater

dilutions every time than on previous occasion, then it was concluded that the person was actually suffering from typhoid. Here again a specific difficulty had to be met with. There is what is called an "anamnesic" reaction occurring in persons who have taken some inoculations previously. By anamnestic reaction is meant the renewed formation of antibodies to previously injected antigen under the stimulus of newly introduced antigen of the same or different nature, which can be explained thus: If a person has taken an inoculation against typhoid previously and is getting an infection of pyogenic or other organisms now, it is found that the antityphoid agglutinins in his blood tend to increase. So when a patient of this sort gets fever suspected to be typhoid, then the interpretation of a widal result for him becomes a difficulty. So, quantitative methods of doing the agglutination tests had to be invented and this necessitated the knowledge of the exact nature of the antigen and the antibody, the antigen being found in the B. Typhosus and the antibody being the specific agglutinin produced in response to it. The antigen had also to be standardised. DREYER was the first man who succeeded in Oxford in preparing standard agglutinable cultures. These were 24 hours growth of typhoid organisms in peptone weal broth culture to which a 0.2% formaldehyde was added. Suitable dilution of this was made to match a density standard and after controlled tests with serum of known potency were numbered and were used for quantitative determinations of agglutination in serum of patients. Though this method is undoubtedly good even now, and was used with great benefit during the Great War, yet was not understood in its true perspective until several years after the war. The later discoveries modified to a great extent the technique as well as the principles of doing this test.

The differentiation of the antigens into H Antigen, O Antigen, and Vi antigen was not known to the original observers. The sensitiveness of the antigen prepared according to DREYER'S method and the production of large, loose flocculi in the agglutination reactions observed by the then workers are now considered to be due to H Antigen. It is also now considered that the addition of formalin advocated in Dreyer's method, renders ineffective the O or Somatic antigen which is already being obscured by the formation of the large H flagellar antigen. In this connection mention must be made of WELL & FELIX who rendered great service to humanity by the discovery of double receptors

present in Proteus and other motile bacteria including typhoid and para typhoid bacilli. It was this discovery that introduced the new problem of two kinds of antigen: H or flagellar antigen and O, the Somatic antigen. The former was found to be capable of forming large, flaky agglutination clumps while the somatic was responsible for fine granular slow forming clumps. The H antigens are found to be more specific than the O antigens, and the O Antigen is common to other organisms in the same group and occasionally is shared by organisms almost usually placed in the group, for example B. typhosis and B. enteritidis have a common O Antigen. The observation of Felix in 1924 led him to conclude that prophylactic immunization with typhoid para-typhoid vaccine resulted in the production of almost exclusively H type of agglutinins. These observations were confirmed by CAMPNER and others. But subsequent investigators have shown that the conclusion of FELIX was not quite correct and that with an inoculation with T. A. B. vaccine the O agglutinins were also stimulated. This fact, with the discovery that normal serum contains only O Agglutinins, resulted in further researches on the subject. Though such discoveries are conflicting a modern method of doing the Widal reaction which can give a fairly accurate idea for the every-day practitioner has been evolved. It is a macroscopic method. The standardised antigen used is, as mentioned before, a standard suspension in both, tested with serum of known potency. Certain standard cultures as H. 901 (non-motile strain) and O. 901 are used in some laboratories. The presence of H. antigen can be ensured in suspensions prepared with other cultures by adding of 2% formaldehyde. A suspension with O antigen alone can be prepared by making the same suspension in broth as before but with an equal volume of absolute alcohol. The mixture incubated for 24 hours at 37°C serves the purpose. The H antigen in this case is destroyed by alcohol. With these two kinds of antigens the test is done as follows:

Ten serological tubes are placed in a row in a rack and numbered. Nine of these are used for the test and one used as a control. A known quantity, preferably 1 c. c. of each of the following dilutions of the serum to be tested are made: 1 in 10, 1 in 20, 1 in 40, 1 in 80, 1 in 160, up to 1 in 2560. This can be easily done by placing 1 c. c. of 0.85% saline in each of the tubes to begin with. To No. 1 tube 1 c. c. of 1 in 5 dilution of the serum is added and mixed well without producing bubbles. The dilution then become 1 in 10. 1 c. c. of this is taken to the next

tube and so on till the last tube. The last 1 c. c. to be taken away from the ninth tube is discarded. All tubes 1 to 9 contain 1 c. c. of dilution serum. To each of these tubes 1 c. c. of suspension B. Typhosis is added. 2 sets have to be made thus one for the H. Antigen and the other for the O. Antigen with the same serum. The control is a mixture of 1 c. c. of 0.85% saline and 1 c. c. of the suspension of Antigen. The addition of the suspension to each tube of the diluted serum doubles the dilution of the serum, and the results are stated in terms of these final dilutions. All the ten tubes are then incubated. Tests for H agglutination should be incubated at 52°C for two to four hours and for O. Agglutination at 52°C for at least 4 hours or sometimes even 24 hours. After incubation it is advisable to place the sets in the ice box overnight before results are read.

The result can be interpreted thus:

1. In agglutinations of O antigens, positives with more than 1 in 50 dilution of the serum can be taken to be positive for typhoid.
2. For H agglutinins, titres of more than 1 in 80 can be taken as diagnostic.

These interpretations are useful only for uninoculated persons. But for previously inoculated persons repetitions of the tests with the standard variety of antigen number of times is necessary, and diagnostic certainty can be reached only when O antigen gives a titre of 1 in 500 or H antigen 1 in 1000. In fact the significance of these antigens, their standardization and their measurable value come into use only in such inoculated persons. In spite of all these improvements the widal result was found to be not very reliable in every case in the army. Many cases with definite clinical symptoms were not found to be positive according to the above methods. So research workers were continuing their work and are still doing so with the result that we are now facing yet another antigen known as the Vi antigen, described and designated so by FELIX and his workers. It is now believed that Widal reactions with Vi antigen producing Vi agglutination are more reliable. This fact is further strengthened by the discovery that in both normal and inoculated individuals this antibody could not be detected. It is a great advantage in that it does not interfere with the interpretation of the results. Almost any strain of typhoid organisms is found to contain Vi antigen when grown on mutton digest agar 2% to which 1% saccharose has been added.

BHATNAGAR has done very useful work on such a strain and investigated the reliability of Widal reactions done with this strain. He has found that Vi antibody in a patient's serum can be taken as diagnostic of typhoid fever, and has further pointed out that this particular

antibody appeared very soon in the blood of inoculated persons when they got infected with typhoid. In fact, in such persons the presence of Vi antibody was observed at the end of the first week or at the beginning of the second week. The antibody was found to disappear as convalescence progressed. At any rate it was found that Vi antibody was found to be there as long as organisms were present in the blood, motions or urine. So he found that the agglutination test with Vi antigen could be usefully employed to spot out cases of carriers who harboured typhoid organisms in their system.

In uninoculated individuals the presence of the Vi antibodies cannot be gauged in the early stages, since it has been found that in such individuals it takes a longer time to appear. But when they do appear they are really diagnostic of infection with typhoid.

Thus the original Widal reaction for the diagnosis of cases of typhoid, though it has undergone many alterations, yet remains the chief help to the practising physician in the diagnosis of his individual cases. It is to be emphasised however that though interpretation of Widal results in uninoculated individuals is fairly easy, yet in the inoculated due care should be taken to get the correct information regarding the various antibodies produced in the person in response to particular antigens before a final interpretation is ventured.

JUST OUT INDIGENOUS DRUGS OF INDIA

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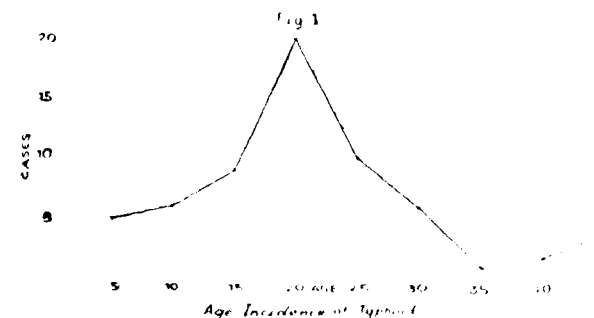
● Dr. S. Zaman Khan, Medical School, Agra

PRELIMINARY REMARKS

My account of and observations on typhoid fever are based on a critical and analytical study of 62 cases admitted into the Thomason Hospital, Agra, during last five years. They are by no means exhaustive, but may be taken as an account of typhoid fever as is met with among our own people.

ETIOLOGICAL FACTORS

Age:—It is common between 5 and 35 years. The age incidence as found in the series under study is represented graphically in fig. 1.



Sex:—It is slightly in excess in males.

Sanitation:—Most of the cases admitted into the hospital belong to the poor class and come from congested areas of Agra.

Immunity:—In none of the cases was there any history of a previous attack or recent inoculation.

THE CAUSATIVE ORGANISM

Much need not be written about *B. typhosus* as it will be a mere repetition of old knowledge. I would however like to mention one particular serological character of *B. typhosus*. The bacillus is made up of two elements: the bacterial and flagellar. The bacterial body antigen is known as "O" or "S" antigen, and the flagellar is known as "H" antigen. These give rise to "O" and "H" anti-bodies, known as "O" and "H" agglutinins. The "O" agglutinins are not individual specific but species specific. They are heat stable and resist a temperature of even 100°C. On

agglutination they produce fine and compact granular masses. They are responsible for the production of active immunity, and for actual bacterial lysis. The "H" agglutinins, on the other hand, is individual specific, i.e., absolutely specific for typhoid bacilli. They do not play an important part in the production of immunity. They do not withstand high temperature, and on agglutination produce large floccular masses. In a patient with typhoid fever or in one inoculated with T. A. B. vaccine both the agglutinins develop, but usually the latter develop to a greater proportion.

The effect of infection with *B. typhosus* on the body may be broadly classified as falling within three definite stages: (1) the stage of infection or bacteriemia where the organisms multiply in the lymphoid tissues, particularly of the small intestines, and from which they are discharged into the circulation producing a condition of bacteriemia. During this process many of the bacilli are killed liberating their endotoxins which, when reaching a sufficient concentration, produce a clinical picture of typhoid fever. This may roughly be taken as the incubation period which is generally between 2 and 3 weeks. (2) The stage of localization of the bacilli, especially in the lymphoid tissues of the small intestines, mesenteric lymph nodes and the spleen. (3) The stage of development of immunity and healing of the lesions or (4) The stage of failure of immunity giving rise to complications due either to excessive toxemia and or to the non-healing of the ulcers leading to perforation or hemorrhage.

The ulcer which *B. typhosus* causes in the small intestines has typical characteristics which are too well known to be described, and follows the usual course of inflammation, viz., hyperemia, necrosis, sloughing and healing.

The effects of generalisation of *B. typhosus* infection are manifested in many ways. The bacilli may persist for many years in the sub-mucous coat of the gall bladder where they live and multiply, and are discharged into the bile. Thus gall-bladder may be considered as the reservoir of infection, not only during the course of the disease but for a long time after recovery. It may be harmless to the patient, but not uncommonly it gives rise to chronic cholecystitis or biliary calculi. Involvement of the nervous system is rare except in the very rare cases of typhoid meningitis where the isolation of *B. typhosus* from the cerebrospinal fluid is possible. Bronchial complications are usually secondary but in a few cases *B. typhosus* has

been isolated from the sputum. Typhoid bacilluria is not uncommon. It must however be remembered that there may not be any gross pathological lesion in the kidneys, except evidence of toxic nephrosis. Urine culture is usually positive to *B. typhosus*. Localised periostitis, osteitis, the typhoid toe and the typhoid spine are other forms of bacillary mischief.

A common finding which I have come across during my investigation is pyæmic abscess. But in all of my cases, the organism found by culture was not *B. typhosus* but *staphylococcus aureus*.

No less important are the effects of typhoid toxins: Zenker's degeneration, leucopenia and anæmia.

Equally important complicating factor is secondary infection with *B. coli*, pyogenic organisms and pneumococcus, giving rise to cystitis, parotitis, abscess, and broncho-pneumonia.

THE TYPHOID CARRIER

I found that at least 2—12% of convalescent patients excrete the bacilli, either in faeces or urine, for a period of six weeks or more after complete recovery from the attack. These may be termed as *temporary carriers*.

I found that 2 to 3% of cases continue to excrete the bacilli even after this period, and they may do so during their whole life-time. They are undoubtedly permanent reservoirs of infection. These may be termed as *chronic carriers*.

It is important to recognise the chronic infection of gall-bladder, present without any signs or symptoms. The bacilli are discharged into the bile and from thence into the faeces. Such carriers are a menace to the community.

Urinary carriers form about 0.5% of the cases.

Detection of carriers is important from the Public Health point of view. The diagnosis of the carrier state is usually made by the isolation of the bacilli from faeces, urine or duodenal contents. Detection can be arrived at:

1. on epidemiological grounds,
2. by Widal's reaction,
3. by McKendrick skin test,
4. by previous history.

THE COURSE OF TYPHOID FEVER

It is usual to describe the course of typhoid fever according to its weekly differences in the landmarks of its multifarious symptoms.

First-week: The patients do not usually seek hospital admission during this stage. Out of 62 cases under reference, only two were admitted at the end of the first week. Some of the more prominent signs and symptoms observed in my series were:

1. Dull appearance and furred tongue except at its tip and edges.
2. A few complained of abdominal pain or discomfort.
3. Ladder-like rise of temperature with morning remissions and evening rise, reaching to 102 or 103°F at the end of the week.
4. Relatively slow pulse (90—100 per minute) and often dicrotic.
5. There was invariably a certain amount of flatulence.
6. Spleen just palpable at the end of the week.
7. Typhoid spots in a few cases on the 7th day: pink macules, 2 to 4 mm. in diameter, fading on pressure and situated on the trunk and abdomen.

8. Leucopenia with relative lymphocytosis.
9. Stool, pea-soup coloured and offensive.
10. Traces of albumin in the urine in a few cases.

This period corresponds to the stage of hyperemia and swelling of the Peyer's patches.

In children, the symptoms showed more variations than in adults. They were usually more severe, and often ushered by epistaxis or a severe bronchitis. The temperature and pulse was higher, but the relatively low pulse was characteristic. Enlargement of spleen and tumidity of abdomen were present.

Second-week:

1. Increasing prostration.
2. Headache is less prominent but deafness may develop.
3. Tongue is drier and coated in the centre with clean tip and edges.
4. Temperature ranges from 101° to 103°F.
5. There is acceleration of pulse—just over 100 per minute.
6. Insomnia may be troublesome and delirium may occur.
7. There is a tendency to diarrhoea in some patients.

This is the period when Widal's reaction is strongly positive. It corresponds to the sloughing of typhoid ulcers. In children the temperature is higher and there is more marked prostration.

* Abridged from the author's thesis submitted for Dr. Joseph Benjamin Prize Competition for the year 1938, conducted by the Gujrat Branch of the A. I. M. L. A.

Third-week :

1. Typhoid state usually commences in severe cases.
2. It is a dangerous period owing to the risk of hæmorrhage or perforation.
3. Meteorism is quite common.

This is the period which corresponds to the separation of slough from the typhoid ulcers.

Fourth-week :

1. Convalescence begins.
2. The temperature falls by lysis, but there is usually a rise in the evening temperature.

This is the period which corresponds to the healing of typhoid ulcers.

TYPHOID IN CHILDREN

In the absence of complications, it may be said generally that typhoid in children is a less severe illness than in adults. Not infrequently improvement sets in at the end of the second week. Onset is more abrupt, and the temperature may be very high from the very beginning. Vomiting at the outset is not uncommon. There may also be some stiffness of the neck, suggestive of meningitis.

DIAGNOSIS

Clinical.—Gradual rise of temperature, comparatively show pulse, characteristic tongue and abdominal discomfort are some of the characteristic features.

Marris Atropine Test.—This is a test discovered by Marris after the last war. The principle of the test is that in diseases other than enteric fever, injection of atropine sulph (1/50 to 1/33 gr.) accelerates the pulse rate to at least 15 beats per minute. In enteric fever, however, there is no acceleration of pulse, at any rate it is less than 12 or 14 beats per minute. Pulse rate in a suspected typhoid patient is counted minute by minute for at least 10 minutes and the average rate is arrived at. Then 1/33 gr. of atropine is injected hypodermically. After 25 minutes, the pulse is counted again minute by minute for ten minutes, and the average is struck. If the difference of pulse before and after atropine is less than 14 per minute diagnosis of typhoid is made.

Blood picture.—There is moderate leucopenia, 3 to 4 thousand per c. m. But there is relative lymphocytosis—30 to 40% or even more.

Serological Diagnosis.—The most favourable time for blood culture is during the early

phase of the infection, i.e., during the stage of bacteriemia during the first five days. The chances for positive culture diminish rapidly after the first week as shown below :

1st week	95 % positive
2nd ..	70
3rd ..	35
4th ..	10
5th ..	2

In the early days of the disease it is not possible to demonstrate the presence of agglutinins in the blood by means of *Widal's test*. But after the first week appreciable amounts of agglutinins appear in the blood and the titre limit gradually increases until it reaches its maximum on the 21st day. Thereafter it declines slowly, but may occasionally persist for some years. The period of highest positive *Widal* is shown below :

1st week	3 % positive
2nd ..	70
3rd ..	90
4th ..	95
5th ..	97

With *B. typhosus* and par. *B.* the lowest titre of serum "O" or "H" agglutination, which should be accepted as diagnostic is a dilution of 1 in 150. During the height of the infection, it is the rule to obtain a positive result in a much higher dilution of the serum. With paratyphosus A, however, the lowest acceptable diagnostic limit should be a dilution of 1 in 25, because the agglutinability of this organism is less marked than that of *B. typhosus* and paratyphosus B.

Recently it has been pointed out that the standard *Widal* test using "H" suspension alone may cause erroneous diagnosis in about 20% of cases, and that therefore "O" antigens should be more liberally used, particularly when facilities for blood-culture are lacking.

Stool culture.—The chances of success in stool culture is shown below :

1st week	15 % positive
2nd ..	65
3rd ..	85
4th ..	50
5th ..	25

Urine culture.—Since the excretion of organisms in the urine is fitful, intermittent and of shorter duration, cultures are not always positive. Hence it is only of confirmatory importance.

The relative importance of blood culture and *Widal's* reaction in different weeks of typhoid fever is shown in fig. 2.

The Commoner Complications in Typhoid *

● Dr. G. S. Patnaik, L. C. P. S. (Bom.),
Malegaon, Nasik

As typhoid fever is primarily a disease of the intestines, the complications are expected mostly from the lesions therein. It is extremely important, therefore, for the medical attendant to know the initial symptoms of intestinal hæmorrhage, perforation and peritonitis; and he should be on guard for them.

The chief intestinal complications are :

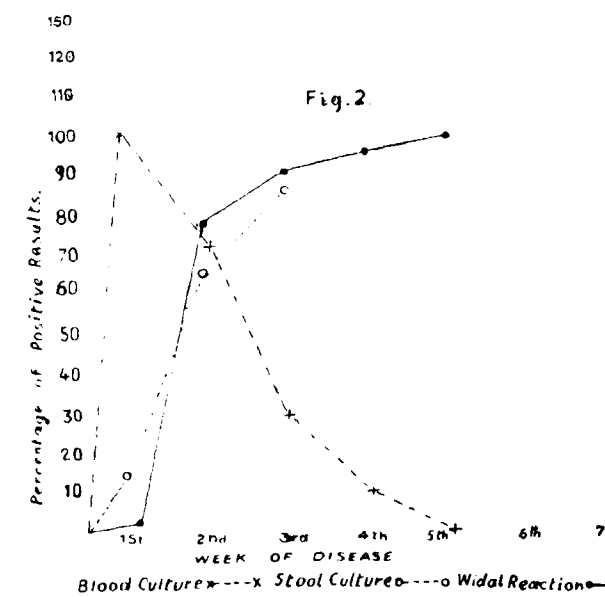
1. Diarrhoea
2. Meteorism and tympanitis
3. Hæmorrhage
4. Perforation

Diarrhoea.—When the motions exceed four or five in number within 24 hours astringents should be administered either by mouth as Dover's powder, or by the bowel in the form of a starch and opium enema. Diet should also be regulated, modified or reduced according to the condition of the patient, particularly in such cases where excessive liquid diet is the cause of diarrhoea. If there is much collapse, the bed pan should be dispensed with, and the motions passed into a draw sheet.

Meteorism.—Or paralytic distension of the bowel, brought about by typhoid toxins, should always be regarded as a sign of utmost gravity, and relief must be obtained immediately. This is particularly so in children who are prone to meteorism. Turpentine in 5 to 20 minim doses, according to age, in almond oil mixture (1 dr.) or suspended in a suitable amount of mucilage may be given three or four times daily provided the kidneys are healthy. Turpentine stupes and/or enema may relieve the conditions in some cases, while in a few a high rectal flatus tube may be of benefit. Kaolin poultice or antiphlogistine over the abdomen is attended with relief.

* Extracted from the author's thesis on Typhoid Fever which secured the Dr. Joseph Benjamin's Prize Thesis for 1938 awarded by the Gujrat Branch of the A. I. M. L. A.

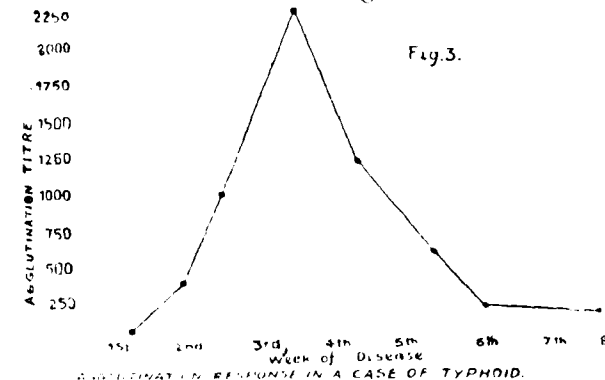
tions are intestinal hæmorrhage and perforation. The first indication of hæmorrhage is rapid pulse and falling temperature. In a case of perforation, there is sudden and severe abdominal pain with or without distension. The temperature falls and the pulse rate increases.



Thus, the bacteriological diagnosis of typhoid fever may be successfully utilised according to the stage of the disease as follows :

Between the 7th and 10th day ... Blood culture
After the 10th day ... *Widal's* test
At all stages, particularly after the second week ... Stool and urine culture, and *Widal's* test

The agglutination response in a case of typhoid fever is shown in fig. 3.



DIAGNOSIS OF CARRIERS

This is arrived at by the cultivation of a sample of bile, faeces and/or urine, and by *Widal's* test.

DIFFERENTIAL DIAGNOSIS

Chronic malaria, influenza, pyemia, and miliary tuberculosis have to be eliminated. It must however be mentioned that malaria may co-exist and alter the typical course of typhoid. Miliary tuberculosis often exactly simulate typhoid. In such cases, reliance should be placed on bacteriological findings.

COMPLICATIONS

Of the many complications of typhoid, the two most important and often fatal complica-

The diet should be reduced, and administered at longer intervals. Less fermentable and carbohydrate food should be given. If there is much cardiac embarrassment due to severe meteorism, pituitrin (5 to 10 international units) eserine sulphate (1.50 gr.) often produces dramatic results.

Haemorrhage:—The ulcer in the intestinal wall may cause erosion to some blood vessels, and thus give rise to haemorrhage. Partly eroded vessels may be ruptured by solid food or from stretching of the intestinal wall from excessive tympanitis. Haemorrhage occurs most often towards the end of the second week or in the third week. If it is small, the stools become dark or tarry in appearance, and sticky. If it is severe, the blood in stools may be red. The prominent symptoms of haemorrhage are:

1. Sudden fall in temperature to below normal
2. Small and rapid pulse
3. Hurried and shallow respiration
4. Pallid face and pinched expression
5. Cold extremities
6. Restlessness or even delirium
7. Shock and collapse

The first steps in treatment are to apply an ice-bag over the abdomen and to keep the bowel at rest by withholding food for some hours. Extreme cases may require opium. It is best given in the form of Dover's powder, 5 grs. every hour in the beginning, and afterwards every six hours for a couple of days. In some cases a hypodermic injection of morphine may be given to ensure a more rapid action. If after two days there is no fresh blood in the stool, or if there is no movement of the bowel opium may be stopped, and an olive oil enema given if no motion was passed by the fourth day. Haemoplastin in 2 c.c. dose gives good response in some cases. If the haemorrhage is severe, and consequently the patient is sinking, physiological saline transfusion may be given, and repeated when necessary, or transfusion of blood from suitable donor may save life.

Perforation:—Fortunately this is rare. It usually occurs in the third or the fourth week. Peritonitis becomes prominent. There is rigidity and extreme distension of the abdomen. In most cases there is sudden, sharp and excruciating pain in the abdomen which lasts for a short time and then subsides. This pain is increased on pressure. Very soon, symptoms of shock and collapse supervene. Treatment is of little avail; closure of perforation by laparotomy is the only choice.

OTHER COMPLICATIONS

Cholecystitis:—There is usually a varying degree of inflammation in the gall bladder. This may extend to bile ducts. It must be remembered that bile is a good medium for *B. typhosum*, and that in typhoid carriers the bacilli persist for years in the gall bladder and biliary passages. Cholecystitis is however more a sequela than a complication, and this is usually treated with heavy doses of hexamine for a long period. If there are gall-stones, operative treatment has to be considered.

Bronchitis and Broncho-pneumonia:—This is a common complication, and should be treated along the usual lines.

Bacilluria:—This again is quite common, and may give rise to cystitis and even retention of urine. It can be treated effectively by hexamine.

Bed-sores:—As the patient is to lie on bed for a long time, his vitality becomes very low, and therefore bed-sores are common. They ought to be prevented by proper nursing.

Toxaemia:—This is a characteristic constitutional feature of the disease, and indicates the virulence of infection. It is usually treated by stimulants, saline per rectum and plenty of glucose-water by mouth. Sponging the body is very useful.

Cardiac Failure:—This is the result of severe toxæmia, and is characterised by irregular, rapid and feeble pulse, with a weak first sound. Stimulants like camphor in oil, strychnine and digitalis, pituitrin or adrenalin, or caffeine sodium benzoate are usually given with some benefit.

Femoral Thrombosis:—Thrombosis, especially of the femoral vein, is not uncommon, and is best treated by keeping the affected leg at rest between two sand bags, and application of glycerine belladonna. Intravenous injection of 5 to 10 ozs. of a 0.5% solution of sodium citrate is usually attended by relief of pain.

Parotitis:—Simple parotitis usually subsides by itself, but if there is suppuration, the pus should be evacuated by suitable incision.

Periostitis:—This is best treated by hot fomentation, and, when suppuration occurs, by incision and drainage. Septic abscesses are best treated by free incisions. The infective nature of the pus must be borne in mind and the patient regarded as carriers.

Headache:—Constant use of ice-bag will give great relief. Aspirin and caffeine citras



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**Recent Advances in the Treatment
of Typhoid Fever**

● Benode Behari Sen, M. Sc., M. B.,
Director, Serum Institute of India

There was a time when typhoid fever was regarded as one of those maladies which were self-limited and thus required no treatment but only proper nursing. Nobody knew whether a particular case would turn into typhoid state and if one would, there was no end of anxiety as ninety-nine such cases out of a hundred, would turn fatal, in spite of the best medical help which was equivalent to no help at all. But science has improved—times have changed.

As it has been established that typhoid fever is due to infection by *B. typhosus*, first in the intestinal tract and subsequently in the general circulation, it should be treated as many other septicæmic diseases are now treated. Recent advances in the treatment of such diseases point to two main directions:

1. Specific treatment (a) by sero-therapy. (b) by veno-phage therapy.
2. Non-Specific treatment (a) by protein therapy. (b) by lipid therapy.

1 (a) *Sero-therapy*:—As is the case with staphylococcal septicæmia, so it is here, ordinary plain (non-concentrated) serum does not give sufficient antibody to deal with this malady. It is the special mode of immunisation of horses that gives best result and then the serum thus produced has got to be concentrated, so that huge quantities of antibodies can be injected in a smaller volume of serum. We are indebted to Felix for this improvement.

To get the best result by this mode of immunisation, the most important point is the immunisation by standard strain, as well as by

(5 grs. each) may relieve the headache, but it should not be repeated.

Insomnia:—If it is continuous, bromide and chloral hydras should be given till sleep is secured.

CONCLUSION

The practitioner must assure himself that the nurse in attendance is carrying out her duties with promptitude and intelligence. In no disease are an experienced doctor and a competent nurse more essential than in the treatment of typhoid fever.

the Felix strain containing Vi antigen. It has been repeatedly seen that serum drawn from definitely diagnosed typhoid cases in the typhoid state, cannot agglutinate standard strains even in a dilution of 1 in 50 or 1 in 25. The general idea may be that the test is wrong,—but blood from the same patient, if carefully cultured, will produce a typhoid strain different in many respects from the standard strain. This has been studied in great detail by Felix, Pitt, Bhatnagar and others. So, serum prepared and concentrated according to the Felix method is the best thing for treating typhoid fever. There is a class of opinion that generally typhoid state comes in by about the middle to the end of the second week and serum is contraindicated in such late cases. But the argument is erroneous because we have always to follow the process of desensitisation. In every case we have to start with $\frac{1}{2}$ c.c., wait for 15 minutes, then inject 1 c.c. and wait for another 15 minutes, then 2 c.c. and wait as before, then 5 c.c. and wait for further 15 minutes, and lastly the balance of 30 c.c. is to be injected. If at any time there is any wheal formed, the next dose is not to be increased but the same dose is to be repeated till there is no reaction. This is for the first day. The next day 30 c.c. is to be injected and on the third day 40 c.c. making a total of 100 c.c. in three days. From the fourth day onwards the dose of the serum will depend upon the effects of the previous 100 c.c. If required 40 c.c. dose is to be continued from day to day to get the desired result.

Venophage therapy:—This is a special method of treatment and the author claims originality in this case. In *Staphylococcus septicæmia*, specially prepared bacteriophage, suitable for intravenous injection, was first tried by McNeal and Frisbee, in America. This led the author to find out a typhoid 'phage (T.A.B.) suitable for intravenous injection. Goswami worked in his hospital with this 'phage with the best of results. Sometime after the publication of my original article, Bower, in America, published in the *Military Surgeon*, his results of intravenous administration of Typhoid 'phage. The only difference was in dosage. The present author subsequently improved upon this method by combined serum and 'phage treatment. The idea was that the 'phage acts on the organisms directly by dissolving them, as is seen in test tubes, or indirectly by increasing the opsonic index and thereby giving the leucocytes chance to devour the organisms concerned. Whatever may be the case (this point is being further

tackled in the author's laboratory) the toxic metabolites which come out, due to dissolution of the organisms concerned, give the reactionary stage, which is an exact picture of malarial fever. The toxic metabolites are neutralised by the previous administration of the concentrated typhoid serum (prepared according to the Felix method) whereby the reactionary rise of temperature is controlled. In the pure serum treatment, we require 100 c.c. as the minimum initial dose (given in three subsequent days), but in the combined phage treatment we require only 30 c.c. of the concentrated serum, and thus it is less costly. We have tried this treatment in more than 200 cases with very good results.

2. (a) *Non-specific protein therapy* has not given any hopeful result though it has been tried.

(b) *Non-specific lipoid therapy*:— '**Sterodin**'. It has been seen in different hospitals that Sterodin, which consists mainly of lipoids derived from pathogenic microorganisms including the typhoid group, stimulates phagocytic response,—the total count of W.B.C. increases along with an increase of opsonic index for many pathogenic organisms. The main effect is found in controlling the high rise of temperature of diseases like typhoid fevers. This method has been first used to control fever, so that Veno-phage may be given trial in such cases.

It has therefore been our experience that typhoid fever can be checked by Sterodin and combined Veno-phage treatment.

Modern Treatment of Typhoid

● A. Viswanathan, L. M. P., Madras

GENERAL PRINCIPLES

There is no disease so elusive to diagnosis, so startling in the occurrence of unexpected complications, so uncertain in prognosis and so baffling to treatment during its various stages of manifestation, as the fever caused by bacillus typhosus (1).

Yet few are the drugs necessary in the treatment of typhoid, and the general practitioner must acknowledge that his successful case is due to other causes than the mere effect of drugs alone.

There is nothing new in the modern treatment of typhoid except that certain old fallacies or beliefs have been given up in the light of further experience. One such is the time-long belief that a typhoid patient should be starved of sufficient food. The modern view is that this semi-starvation is unnecessary and injurious. In fact, such a regime is more likely to precipitate intestinal hæmorrhage or perforation of a typhoid ulcer. Another old belief is that even a mild purgative is contraindicated in typhoid. If it is so enthusiastically advocated in bacillary and amoebic dysenteries where the chief lesions are in the large intestines, the question may be asked why a purgative should not be given in typhoid where also the lesions are intestinal, although they differ in location and nature. In dysenteries purgatives are given to flush out the toxins and bacillary products from the intestines, and form a sheet anchor in treatment. Then why not the same method be adopted to achieve a similar purpose in typhoid? The only argument against the purgative is the possibility of perforation, but the incipient typhoid ulcers in the first two weeks are not at all likely to give way. The writer can bear out by his experience the observation of Haviland Minchin that a gut kept in a state of active peristalsis is far less liable to bleed or perforate than one that is allowed to become clogged with fecal material or distended with gases of putrefaction (2). He advises a drachm of castor oil daily, the object being to produce one or two soft easily passed motions a day (*ibid*).

The essential principles of treatment of an ordinary case of typhoid may be summed up in brief: generous but judicious dietary, hydrotherapy, and proper nursing. These principles are in entire consonance with its pathological features. If the practitioner

realises that this disease is an intense toxæmia with pronounced intestinal lesions tending towards restoration at the end of the third week: that almost all its complications are due to ketosis and extensive ulceration of the small intestines, especially of the cæcum, resulting in meteorism, perforation or hæmorrhage: he will be less inclined to belittle these three essential modes of treatment which offer the best chance against ketosis and intestinal complications. Proper and sufficient diet of good calorie value conduces to an orderly metabolism, as far as it is possible under the circumstances. Hydrotherapy conduces to the limitation of toxins, relief of intestinal congestion and prevention of hyper-pyrexia. Efficient nursing contributes to personal hygiene and comfort.

DIET IN TYPHOID

The diet must be prescribed with reference to the patient's needs and idiosyncrasies. No fetish should be made of text-book directions in this matter. European diets are more or less unsuited to Indian patients. Thus for example, albumin water made out of the white of an egg, or chicken broth and soup, so commonly prescribed by European doctors in our country, may not suit a life long vegetarian. It may aggravate the alimentary symptoms. While milk and its preparations, such as whey and butter-milk, may suit excellently an Indian patient to whatever province he may belong, do not agree with a Burman to whom milk or ghee are not common articles of food. Rice congee with salt or sugar, albumin water and chicken broth will be better suited to and relished by him than milk and its preparations. The typhoid diet should not therefore be standardised but adapted to the individual requirements and habits of each patient.

Broadly speaking, certain principles, however, should govern our recipe.

The first principle, in the words of my teacher Col. Donovan, is: in the first week feed the patient like a fighting cock; in the second, as much as it is agreeable to the patient short of causing intestinal symptoms; in the third, restore the first week's diet as far as possible; in the fourth week introduce cautiously easily digestible solid food such as double boiled rice with well-cooked vegetables and dhal.

The second principle is: there should be no indiscriminate avoidance of carbohydrate in favour of milk or other patented proteins. It is now demonstrably proved that carbohydrate starvation would harbingers ketosis with all its evil train of well-known symptoms.

The third principle is to stop any article of diet that is contributing to the manifestation of undesirable symptoms.

The fourth principle is to maintain the necessary calorie requirements of the body. The average Indian patient requires at least 2 to 3 thousand calories per day (3). With a diet of adequate calorie value many of the complications can be prevented and the period of convalescence shortened.

HYDROTHERAPY

Internal hydrotherapy in typhoid is effected by generous draughts of water, given simply as such or combined with glucose.

External hydrotherapy is indicated when there is hyperpyrexia, delirium and insomnia. The Indian patient is not averse to ice-bag or cold sponging, but he would resist such heroic methods as cold packs, ice-tubs, etc.

DRUG THERAPY

The writer has treated many cases of typhoid without drugs altogether, unless there be some complications.

Diaphoretics: A simple alkaline diaphoretic is quite sufficient. Aspirin or cryogenin should not be given to combat hyperpyrexia.

Antiseptics: Calomel, salol and Burney-Yeo's chlorine mixture have ancient reputation but they are of doubtful value. Urotropine is certainly indicated in the later stages of the disease so that the patient may not become a carrier.

Purgatives: There seems to be no harm in giving small doses of purgatives once in two days. Castor oil 1 dr., or mag. sulph 1 dr. may be given without any ill-effects (2), every-day or every alternate day, preferably in the mornings. The purgative dose should be so adjusted as to obtain not more than two semi-solid motions a day.

Sedatives: They are indicated when there is delirium or insomnia. The safest drugs are bromides. Barbiturates or opium alkaloids should never be restored to.

Stimulants: They are rarely indicated in ordinary cases of typhoid. Alcohol, strychnine and digitalis, and cardiazol are indicated only during shock and collapse following hæmorrhage or perforation.

Adjuvants: An ounce of glycerine can be put in a diaphoretic mixture to allay thirst and dryness of the tongue. Dextrosol or Glucose D can be used liberally in all drinks, as it prevents ketosis by a liberal carbohydrate supply.

FRUIT JUICES IN TYPHOID

Even before the recent discovery of the importance of vitamin C in the prevention and

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cure of acute infectious diseases, empirically fruit juices were advised by the physicians in typhoid. Researches have now justified the erst-while empirical use of fruit juices.

Grape, lime, orange or tomato juices may be given according to the taste of the patient. Of these, lime juice is the cheapest, most easily available and in no way inferior to other juices.

Sometimes undiluted orange juice is not well-tolerated by the patient. The same patient would tolerate it if well diluted with iced or plain cold water.

NURSING IN TYPHOID

Nursing in typhoid would always call for dexterity, tact and perseverance on the part of the nurse. Co-operation between her and the attending physician is essential.

SPECIFIC TREATMENT

Typhoid serum, typhoid vaccine and anti-typhoid bacteriophage have all been tried with indifferent results. The American experience with Feli typhoid serum is not altogether convincing. The writer has used curative typhoid vaccine (B. I. & Co.) and typhoid phylacogen (P. D. & Co.) in cases where it has been possible to diagnose the disease by blood culture within the first 10 days of the attack. They can be trusted to prevent complications. In the later stages, vaccine is practically of no value. Oral bacteriophage has not been effective even if used early in the disease.

TREATMENT OF COMPLICATIONS

Except hæmorrhage and/or perforation most of the complications could be treated successfully.

Severe toxæmia in the form of persistent headache and delirium must be combated by external hydrotherapy and internal sedatives. If delirium is very severe, lumbar puncture is useful. The cerebro-spinal fluid is allowed to run as long as it flows under pressure. Sometimes, an intravenous injection of 10 or 20 cc of a 20% solution of magnesium sulphate gives good results.

Diarrhœa, unless it is severe, must not be tampered with. If it is severe, it should be checked by regulating and reducing the diet, failing which bismuth and Dover's powder may be used.

Tympanitis and meteorism, particularly formidable in children, should be treated by turpentine stupes. 10 or 20 units of pituitrin or 1/50 gr. of eserine hypodermically can be given with advantage. Prasad strongly recommends intramuscular administration of Thiamin (Be-taxin) for meteorism and he

attributes the successful result to the tonic action on the gut of vitamin B & B₁ (4).

Typhoid bacilluria should be treated by urotropine in 60 gr. doses per day.

Orchitis, mastitis and parotitis generally subside without our intervention. The writer would recommend an ice bag over the inflamed parts rather than a hot fomentation.

Circulatory collapse is treated on usual lines: glucose-saline infusion, digitalis and strychnine.

Cholecystitis, which is more a sequela than a complication, yields to urotropine if persistently used. If it does not, surgical intervention may be necessary.

Severe hæmorrhage is usually fatal in spite of hæmoplastic serum and/or calcium gluconate injection. Blood transfusion may be done if it is possible.

Perforation also is usually fatal and surgical intervention is mostly unsuccessful.

But minor degrees of hæmorrhage or perforation are not at all fatal provided immediate treatment is given.

PREVENTION AND PROPHYLAXIS

Typhoid epidemics were prevented in Europe and America by the introduction of protected water supply which is also chlorinated, and by the construction of underground drainage in all the important and crowded cities.

In our country these improvements have been effected only in the provincial capitals. Yet epidemics of typhoid in Calcutta, Bombay and Madras are quite frequent. This can only be explained by the fact of the existence of a reservoir of infection. To the knowledge of the writer, no typhoid patient is kept long enough in the hospital till he is bacillus-free. It is these symptomless carriers who are undoubtedly the reservoirs of infection. Until these carriers are traced and treated, the epidemic is likely to occur in periodic waves.

Prophylaxis is attained by anti-typhoid inoculation. The protection lasts at least for six months.

SUMMARY

(1) The general principles of treatment have been discussed. An attitude of masterly inactivity is more profitable than frequent interference and promiscuous drug therapy.

(2) The diet in typhoid should meet the calorie requirements of the patient, and suit his taste and idiosyncrasy. A generous and balanced diet would prevent most of the distressing complications.

(3) The importance and utility of hydrotherapy is brought out briefly.

(4) Indications for drug treatment are given.

(5) The failure of specific treatment is noted.

Pitfalls in the Diagnosis and Treatment of Typhoid Fever with a few Illustrative Cases*

● Dr. D. N. Adhikary, Medical Officer, Debagram Charitable Dispensary

Typhoid fever is one of the commonest diseases which a practitioner has to deal with in his day-to-day practice. As such he should be fully conversant with its most important signs and symptoms by which it can be differentiated from other continuous fevers.

It must be recognised that the allied group of fevers caused by para-typhoid A, B and/or C, are clinically indistinguishable from the classical typhoid fever. This can be done only by serological examination of the patient's blood. The bacteriological classification of enteric fevers is as follows:

INCRIMINATING ORGANISMS	
Typhoid fever	... B. typhosus.
Para-typhoid fever	... Para A, B, and/or C.
Para-enteric fevers	... (1) B. Asiaticus (2) B. Morganii (3) B. Fecalis alkalgines (4) B. coli (5) Bacillus of epidemic jaundice.

Typhoid is usually a water-borne disease. Contaminated milk, water or food is the chief source of infection. Finger and flies are the common means of spread of infection. Typhoid carriers may be considered as reservoirs of infection. Apart from personal hygiene, the sure method of protection is by

* A paper read at the 7th Bengal Provincial Conference of the A.I.M.L.A. on 24th March 1940.

(6) The importance of vitamin C in the form of natural fruit juices is stressed. This is more important than drug therapy.

(7) Treatment of complications is briefly detailed.

(8) Important methods of prevention and prophylaxis are outlined. The recurring epidemics in the important cities of India, although their water supply is fairly well protected, are suggested to be due to the promiscuous existence of carriers.

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T. A. B. inoculation. Complete protection can be had if inoculation is planned as follows:

1st dose	1 cc.	...	50 millions of bacilli,
2nd .. (4th day)	..	...	100 .. "
3rd .. (6th day)	..	...	200 .. "
4th .. (8th day)	..	...	400 .. "

To be followed by anti-typhoid serum 30 cc. on the 15th day.

This, in my experience, has given complete immunity against typhoid infection.

Every continuous fever should be suspected as a case of typhoid, and treated as such until proved otherwise. From the very start, the patient should be put to complete rest and his strength conserved by judicious diet. A case seemingly mild at first may turn out to be grave either from toxæmia or from one or more of the many complications incidental to this disease.

So far as our country is concerned, the diseases from which typhoid is to be differentially diagnosed are:

- (i) Malaria with continuous fever showing typhoid like symptoms.
- (ii) Acute form of kala-azar.
- (iii) Miliary tuberculosis.
- (iv) Meningitis due to infections other than typhoid.
- (v) B. coli infection.
- (vi) Influenza.
- (vii) Lobar or broncho-pneumonia due to infection other than typhoid.
- (viii) Puerperal sepsis.

The following illustrative cases would show the difficulty in diagnosis and treatment:

Case 1: *Malaria with severe tympanitis, bronchitis and diarrhoea.*

I saw this patient on about the 8th day of his disease when I found him dull and apathetic with tympanitis and a temperature ranging between 100°F and 105°F. It was said that his temperature came to normal after two injections of quinine, after which, however, it rose up and became continuous. Blood was negative to malaria parasite for the obvious reason that quinine was administered before blood examination. I also gave quinine bihydrochloride (gr. 5) by injection and the next day the temperature came to normal. But when quinine was discontinued, the fever rose up again. I pushed on a few grains of Aristochin this time, and the patient came round within a few days. The point of interest in this case was that insufficient dose of quinine did not check malaria, and as a consequence various complications did supervene and simulated enteric fever.

Case 2: *Typhoid (?) with meningeal symptoms.*

The younger brother of the patient had an attack of enteric-like fever about a month ago. The patient was suffering from continuous fever for about 20 days. He had a dull and apathetic look. Pulse 80–90 per minute, temperature 101–103°F; respiration 25–28 per minute. There was stiffness of the neck though Kernig's sign was not definite. A day or two later he developed meningitis and became unconscious. There was also excessive bleeding from the gums. Lungs showed signs of broncho-pneumonia. Tympanitis was not marked. The case was treated successfully on symptomatic lines: hydrotherapy for fever and toxæmia; injections of neo-hæmoplastin and calcium to control bleeding; anti-streptococcal serum and

prontosil on the basis of a suspicion of secondary streptococcal infection; glucose and urotropine intravenously.

Case 3 : Perforation due to soap and water enema.

A boy of 8 yrs. I attended on him on the 10th day of his illness. Fever 101—104° F.; marked tympanitis; a little jaundice; slight delirium, restlessness and diarrhoea; marked emaciation and weak heart. I administered bi-typhoid phage and bi-intestiphage for three days-8 ampoules daily. I was not able to attend on this case for a couple of days when another physician gave a soap and water enema for the complaint of constipation. No stool came out, and the soap water was retained inside. After two days, the patient complained of severe abdominal pain. There was extreme tenderness and tympanitis. Temperature 98° F. Pulse thready and collapsing. The patient expired the next day.

This case is a warning against vigorous attempts to combat constipation by soap-water enema.

Case 4 : Typhoid with multiple and serious complications.

I was consulted on the 12th day of the disease. He developed severe delirium, diarrhoea, tympanitis and later on haemorrhage. The case was treated successfully on the following lines:

- (1) Ice bag to head and tepid sponging.
- (2) Anti-typhoid serum.
- (3) Hemostatic serum and calcium injections to control haemorrhage. Tr. Ferri per chloride m. 15, t.d.s. gave good results.
- (4) Anti-streptococcus serum and prontosil to combat secondary infection with streptococcus.
- (5) Urotripine and glucose intravenously to relieve toxæmia and bacilluria. Also glucose D by mouth.

CONCLUSIONS

- 1. Specific treatment with bacteriophages or with antityphoid serum at an early stage gives good results.
- 2. Symptomatic treatment should not be neglected.
- 3. Hydrotheraphy has a definite value in the treatment of typhoid.
- 4. Sulphonamides seem to have a definite value in typhoid, but their specific action on B. typhosus and para typhosus requires further investigation.
- 5. Careful nursing and proper dieting are important.
- 6. Constipation should not be vigorously treated by soap water enema. Glycerine enema is the safest.
- 7. Particularly when bacteriological diagnosis is not available, it is safer to treat any continuous fever as if it is typhoid.
- 8. Secondary infections should be searched for and treated suitably.

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Diet as a Factor in the Treatment of Disease*

• S. C. Dutta, L. M. P., Itakhooli T. E. Kheto, Assam.

Dietetics have taken a prominent place in the science of treatment during recent years. With the advancement of our knowledge in nutrition and bio-chemistry of human system there has been a good lot of change in our conception regarding dietary both in health and in disease. Some important systems of dietary in relation to some particular diseases are described here.

TUBERCULOSIS

In this disease Gerson's diet was followed for a long time. The principle of this diet consists in giving more fat but less carbohydrate and protein. The idea of reducing protein and carbohydrate was to give the system of the tuberculous patients a sort of physiological rest by lowering the basal metabolic rate and the rate of pulmonary ventilation. But the ideas have changed now. In formulating diet for consumptives the aim should be to increase the vitality and weight of the patient by a balanced diet rich in vitamins, easily digestible and easily assimilable. The diet should be very gradually increased according to the tolerance of the patient till the total caloric value is upto the normal standard of a healthy individual. The articles of diet should be rice, bread, chicken, fish, milk, butter, egg, fresh fruits and vegetables. Quantity of milk should be very carefully increased according to the power of digestion.

TYPHOID

In febrile states, metabolic rate is very high. Hence to maintain the nitrogen-equilibrium of of the body, a high caloric diet is recommended. From the second week of typhoid, body-metabolism becomes highly increased and if there is want of sufficient food, particularly protein in the diet, the body protein is utilised and after that the carbohydrate and fat storage in the body is encroached upon. As a result, the muscular layer of the intestine gets thinned out with a greater chance of perforation. Hence the usefulness of giving a high caloric diet consisting of selected articles of carbohydrate, protein and fat. The following diet tried in the Calcutta

* Read at the Scientific Meeting of Tingri Valley Branch. A. I. M. L. A. on 25-2-40.

School of Tropical medicine may be taken as a type.

Articles.	Quantity in oz	Protein gms.	Carbohydrate	Fat gms.	Total Calories
Milk	40	37.5	54.5	41	720
Chicken soup	4	12	2	1	65
Orange	6	4.5	40.4	...	180
Sugar	1	...	113	...	452
Glucose	4	...	113	...	452
Bread	2	4	30	5	140
Total	...	58	353	12.5	2009

The above articles should be divided and adjusted into eight two-hourly feeds according to the individual liking and convenience. This diet is particularly indicated in the first stage of the disease and should be followed till the digestion of the patient permits. If the digestion is bad or the case is found late when gastro-intestinal troubles have set in the diet should mainly consist of liquids.

DIABETES MELLITUS

The treatment of diabetes was carried out mainly by dietetic measures before the discovery of insulin. The plan usually adopted was to keep the patient on starvation diet for the first few days and then to increase the diet by protein and fat, severely restricting carbohydrate. But it was found latter on that severe restriction of carbohydrate is harmful as it hastens ketosis and makes the condition worse.

After the insulin treatment was discovered, it was further experienced that severe restriction of total diet is simply unnecessary and harmful. The principles adopted now may be summed up in short as follows:—

If the disease is very mild it can be cured by simple restriction of carbohydrate diet. If the case is severe, one of the following lines of treatment is adopted (a) Basal diet with insulin (b) Starvation diet followed by gradual increase in dietary with or without insulin according to necessity. Here we are concerned with the estimations of 'Basal diet' and 'ladder diet'. Basal calories may be estimated by considering the age, height and weight of the patient and then looking into some standard charts e.g., that of Dreyer or Dubois or by multiplying the patient's ideal weight in lb. by 11'3. When the total calorie-requirement is found it is distributed into protein fat and carbohydrate in the following way: $\frac{1}{3}$ gm of protein per lb of body-weight is allowed for adults. The remaining calories are divided by 30 for finding the carbohydrate required in gms. The rest goes on to fat.

Dr. Bose's formula for calculating a diet for a patient in sedentary life is rather easier.

Weight of the patient in seers $\times 25$ = Total number of calories required.

Total no. of calories required = fat in gms.

Total no. of calories required = carbohydrate in gms.

Total no. of calories required = protein in gms.

In the second method of dietary, Graham's Ladder Diet is best resorted to. This consists mainly in the following definite steps for an adult of average weight.

- (1) First day :— complete fast.
- (2) Second day :—Carbohydrate—12 gms.
Protein —36 ..
Fat —48 ..
- (3) This is gradually increased till on the tenth day it reaches :— Carbohydrate—72 gms.
Protein —71.4 ..
Fat —97.5 ..

(4) If urine is sugar-free, increase carbohydrate daily by 10 gms. till 100 gms. are reached on the third day. At this stage, the diet is practically close to 'maintainance diet' as described above.

Graham's ladder diet is contraindicated where 'ketone' bodies are present in the urine.

The articles of diet should consist of the following:—egg, chicken, fish, cheese, milk, butter, cream, ghee, besides selected articles from carbohydrate. The carbohydrate contents of oat-meal, flour, potato and fruits are high and should be avoided. Boiled-rice is better than bread. The following vegetables are to be preferred as they contain less carbohydrate:—Lettuce, cucumber, celery, tomato, water-cress and lemons. After boiling in three changes of water so as to reduce the carbohydrate content, the following vegetables may also be taken :—Spinach, cabbage, cauliflower, onion, beet, turnips, carrots. Tea and coffee without sugar may be taken freely. Alcohol except beer may be taken in moderation. Saccharine should be used as a sweetening agent where necessary. Bran-biscuits may be taken freely.

OBESITY

Obesity other than due to any disease is treated almost entirely by dietetic measures. William Banting introduced in 1863 his method of treatment for obesity and the main principles are still followed with slight modifications. Banting's diet contains large amount of protein, restricted amount of carbohydrate and minimum quantity of fat. The constituents are as follows:

Protein	170	...	180 gms.
Carbohydrate	80	...	85 gms.
Fat			7.5 gms.

Bread, milk, butter, sugar and potato are forbidden. Fish and meat containing much fat are not allowed. Quantity of fluid taken should be limited.

In the treatment of obesity the patient's weight should not be reduced rapidly. Loss of weight at the rate of one pound per week is ideal. The elderly patients should be treated in bed.

NEPHRITIS

In chronic parenchymatous nephritis and nephrosis, Epstein's high protein diet is recommended. It is based on Epstein's theory that in these diseases, the protein-content of the blood is greatly reduced and there is change in the albumin-globulin ratio of the plasma. The diet consists of:—

Protein	190	...	240	gms.
Fat	20	...	40	"
Carbohydrate	150	...	300	"
Total calories	1280	...	2500	

PEPTIC ULCER

B.W. Sippy's dietetic treatment is found useful in this disease. The principle is to begin with milk and cream, gradually adding other proteins and carbohydrates. At the beginning, equal parts of milk and cream are given every hour from 7 A.M. to 7 P.M. The quantity of each feed should be 3 ozs. After two days, a half boiled egg is added in the morning meal and three ounces of cereal in the evening meal. Very gradually eggs and cereals are increased and finally cream-soup, vegetables and jellies are substituted for milk and cream.

The following are a few other important systems of dietary used as therapeutic measures.

KETOGENIC DIET

This diet was originally introduced for the treatment of epilepsy in children. Later on it came to be used successfully in the treatment of colon-bacillus-infection. It has been named so, because ingestion of this diet is followed by formation of ketone bodies. The diet consists of minimum quantity of carbohydrate, small quantity of protein and maximum quantity of fat so that the ratio of glucose to fatty acids is 1 : 3. The disadvantages of this diet are that it requires close observation of the patient and is unsuitable for very ill patients. The quantity should be roughly as follows:—

Carbohydrate	...	20	gms.
Protein	...	78	"
Fat	...	250	"
Total calories		2642.	

The articles of diet should be selected from fruits, eggs, butter, cream, meat, salad. The bread may be made of soya-bean.

SALT-FREE DIET

In oedema, particularly of cardiac and renal origin, chloride-retention occurs in the system. So the diet should be free from salt as far as practicable by careful selection of dietary articles and cooking them without adding salts. The articles to be avoided are ham, cheese, bread and sea-fish which are comparatively rich in salt content.

WEIR MITCHELL DIET

This is recommended in the treatment of neurasthenias. The treatment consists in complete rest both mental and physical and high feeding combined with massage and electric measures.

At first 4 oz of skimmed milk are given every two hours flavoured with enough of tea, coffee and salt. If digestion is impaired lime water, barley water and rice water may be added. The milk is increased to 10 oz every three hours. After one week a light break-fast is added to the diet. A few days later mutton and then bread and butter are added. In this way an enormously high-calorie diet is reached.

PURINE-FREE DIET

This system of diet is indicated in arterial disease, gout, rheumatism, asthma, dyspepsia, epilepsy and hysteria. These diseases are supposed to be caused or aggravated by the accumulation of uric acid and other purine bodies in the system. The diet should consist of bread, butter, porridge, milk, vegetable soup, potato, rice, cheese, fruits, salad, sugar and small quantity of fish. Nucleo-proteins e.g., liver, pancreas, kidney are strictly avoided. Fruits are allowed except those containing oxalates e.g., tomato, salads and turnips. Oxalates help retention of purine bodies.

Besides the diseases mentioned above, the food-deficiency diseases e.g., beri-beri, rickets, scurvy, pellagra and anaemia require special dietary as substitution therapy. The requirement of diet varies in different ages and in females during pregnancy also.

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Typhoid in Calcutta *

● Dr. S. K. Ghose, M.B., D.T.M.
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The heavy toll of life taken by this fell disease in Calcutta during the last ten years may be tabulated as follows:—

Year	Death per mille
1927	0.83
1928	0.84
1929	0.71
1930	0.67
1931	0.67
1932	0.71
1933	0.81
1934	0.78
1935	0.74
1936	0.85
1937	0.99

With a population of about a million and a quarter, this works out to a figure ranging from 67 to 85 per 100,000. Assuming a mortality of 10 per cent, this gives an annual incidence of about 850 to 1,000 in a population of about a million and a quarter. When we compare the mortality figure with those in some American cities, the striking contrast is at once apparent that in Boston the death-rate from typhoid was 1 in 200,000 in 1932 as against 71 per 100,000 in Calcutta. In several other States, the figure varies from 1.2 to 4.2 per 100,000 in 1932. The reduction in mortality figure in the American cities has been brought about by various factors, the most important of which were clean and quick method of sewage disposal, protection of water-supply, protection of food from flies and dust, and last, but not least, control of "carriers."

"CARRIERS" OF THE DISEASE

In our country the very important part played by "carriers" in the dissemination of this disease is always overlooked. When a case or a group of cases occurs, the incidence is immediately ascribed to water-supply or milk, but few would care to dive deeper and try to find out the source of pollution. I would, therefore, attempt a short description of the nature of the "carriers".

The "carriers" may be described as the "reservoirs" of the disease-producing organisms. They are apparently healthy and immune individuals, usually unaware of the germs stored in the system, and discharging them either continuously or intermittently, for days, months or even years. During convalescence from typhoid, the discharging of the bacilli along with urine and stool gradually disappears; but it has been found that in about 2 to 5 per cent of the cases, the discharge continues indefinitely, even after recovery. It is, therefore,

* By Courtesy : *Cal. Mun. Gaz.* Health Number 1940.

evident that an infected healthy "carrier" is able to infect the surroundings and cause disease in persons when conditions are favourable for the growth of bacteria. Thus an unsuspected "carrier" is, in some respects, more dangerous than a diseased person, as people are forewarned in the latter's case and are careful to avoid the infection.

Let us now consider the factors which favour the spread of the disease in our City.

SERVICE PRIVIES

At present, there are altogether 42,512 service privies in the city, while the number of connected privies is 41,451, i.e., less than half the total number of privies in Calcutta is connected. It is well-known that service privies in our *bustees* are grossly neglected. Many of them have no trap doors, the excreta is not removed regularly and when it is done, it is carried out in a very careless manner, so that the surrounding ground is covered with filth. Sufferers from typhoid and convalescents as well as "carriers" abound in the *bustees* and use these privies. Flies settle on them and carry on their wings and feet germs of the disease and infect articles of food. It has been proved in a European Boarding School, that a number of flies, marked with colouring matter and let off in the privies of a neighbouring *bustee*, were caught in the kitchen of the school.

It has also to be noted that many of our servants and cooks live in *bustees*, amid unclean surroundings, and for aught we know, they may be "carriers". Again, hawkers keep their wares in *bustees*, and many of the sweetmeat shops are located in *bustees* or near them. Though there is legislation to prevent exposure of articles of food, it is honoured more in the breach than in observance. Considering that typhoid bacilli enter the system only by the alimentary canal, the significant part played by the city's service privies is self-evident.

WATER-SUPPLY

Precaution at the source of supply:—It is needless to state that the most important factor in the control of typhoid is the safe-guarding of water-supply. It is also to be remembered that the source of the supply should be as pure and free from pollution as possible. The site for the city's water-supply installation was chosen at Pulta, about 16 miles north of Calcutta, for this reason. The flow tide can scarcely carry the foul discharge of the city so far as Pulta. Though a few jute mills have sprung up within a few miles of Pulta, the law enjoins sterilisation of the effluent from septic tanks before it is discharged into the river. Elaborate and careful arrangement exists at Pulta for storage, sedimentation and filtration and for prevention of contamination at any of the stages. There is a well-equipped laboratory in charge of a well-qualified analyst who examines the water at every stage of purification: viz., raw water, settling tank water and individual filter beds. Only those filter beds which are found to be 'safe' under the standard laid down by the Ministry of Health,

London, are allowed to discharge their water to the mains. Whenever the slightest suspicion arises about the quality of water chlorination is resorted to. It has been found that Pulta water is perfectly satisfactory generally, and it is only on rare occasions that it has been found necessary to chlorinate it. Still, to be on the safer side, the question of systematic chlorination (Verdurisation) at Pulta may be seriously considered in the best interests of public health.

Storage at Tallah:—The filtered water with sufficient pressure travels through 48" and 60" water-mains with great velocity and discharges into the underground reservoirs at Tallah. These reservoirs are absolutely closed and provided with a few manholes having very heavy covers which can only be lifted by combined efforts of at least two men working with the help of a lever. During its journey from Pulta to Tallah there is no chance of contamination of the water anywhere. In the reservoirs at Tallah also there is very little risk of contamination. The whole area and the surroundings are also kept in as clean a condition as possible. Samples are collected from the reservoirs daily and examined and no instance is remembered of the water being ever found contaminated.

Distribution in the City:—The Corporation Year Book for 1939 discloses that the total length of the filtered water mains is 453.75 miles. It is preposterous to suppose that there would be no leak along this length. Besides, as the mains were laid more than 60 years ago, some of them must have been worn out. The total length of sewers, both brick and pipe, is 275 miles. Both the water mains and the sewers are laid underground, close to each other, and at some places the water-main has passed through a manhole or a sewer.

THE SEWAGE SYSTEM

The sewage system of Calcutta is admittedly inadequate. Even after a moderate shower, the streets are flooded as the sewers fail to dispose of the extra water. Further, during the last few years, supply of both filtered and unfiltered water has been increased, thus throwing a heavy burden on the capacity of the sewers, leading to water-logging. At all leaking points, the sewage escapes and saturates and pollutes the subsoil. Very naturally, the leaking water-mains passing through such subsoil, suck up the polluted water during negative pressure in the mains and, in some cases, cause complaints against dirty water from the taps, which further testify to sewage contamination. Almost in every rainy season, action has to be taken in such cases—local supply is cut off, water is supplied by lorries, leaks are detected and rectified, local chlorination is done, and when after bacteriological examination the water is found to be safe, the supply is restored.

As regards remedial measures against such contamination, it will be of interest to note the following remarks of the then Chief Analyst in his evidence before the Filtered Water Contamination Committee in 1927:

"If it is not possible to absolutely stop the leaks either in the sewers or the mains, the next question that arises is—what should we do to prevent the entrance of sewage into the mains. The only measure which I can think of is the maintenance of some amount of pressure within the mains. I am firmly convinced that nothing short of this can prevent contamination of filtered water within the mains." (Italics are mine.)

Storage at private houses:—All big institutions like hotels, clubs, boarding houses, jute mills etc., and also many houses of well-to-do people, and almost all modern houses of much smaller size are provided with masonry underground reservoir from which the water is pumped up into overhead tanks, and from there the water is distributed to various parts in the building. From personal experience the writer has found that samples drawn from the water of private reservoirs have in many cases yielded unsatisfactory results, while a sample from a tap in the same premises directly connected with the Corporation mains was found far better in results. 72 per cent of the houses thus tested were found to be contaminated. In one house, (17 Tarachand Dutt St.) 27 cases of enteric occurred in the course of a month and-a-half (April and May, 1939.) It was found that the first case was imported, but subsequent cases were due to contamination from the reservoirs.

SUGGESTED CONTROL MEASURES

The conversion of service privies should be taken up in right earnest. In unsewered areas, service privies of special and approved design should only be allowed.

Control of Typhoid patient and convalescents:—Though the Municipal Act makes Typhoid a notifiable disease, it is seldom notified by attending physicians. If these cases are reported, the Health Department can take suitable action to disinfect the discharges, educate the attendants and take other steps, e.g., inoculation to prevent the spread of infection.

Another factor which helps the spread of infection is the marked disinclination of persons to go to hospitals. It must be stated that want of accommodation in the hospitals has also been felt. Patients remaining at home are prone to spread the disease. On the other hand, the hospitals also should be careful not to discharge cases unless the stools are found to be free from typhoid bacilli.

Control of "Carriers":—This is a very big problem. Unless hospitalisation is encouraged it is difficult to tackle this problem. However, one of the recommendations of the Typhoid Conference which was held in 1933 was as follows:—

"That proprietors of boarding houses, hotels, restaurants, etc., should take special care to ensure that cooks and servants who handle foodstuffs are certified that they are not carriers of typhoid or other bowel diseases".

To give effect to this recommendation, we can begin in a modest way, by requesting the Hotel

The Curious Career of Typhoid Mary*

• Dr. George A. Soper

authorities to send their cooks to a laboratory for examination. With our existing staff, we can take up a few cases every week, for examinations of blood, urine and stool. If the proprietors take up the idea and co-operate, we can make the practice obligatory. A small fee may be charged to enable the Corporation to increase the staff required for this purpose.

Protection of foodstuffs from dust and flies:—This very necessary precaution is very little appreciated. It is true that the rules are not as strictly enforced as they should be and exposure of foodstuffs to dust and flies is a common occurrence in the streets of Calcutta. Here the public have a duty to perform. They should resolutely refuse to patronise a shop which does not keep its wares properly covered. Public co-operation in this matter should make delinquents careful, as denial of public patronage is a sure remedy against criminal carelessness.

Preventive inoculation should be popularised as much as possible. The Department arranged to give free inoculation to 'contacts' and to those who asked for it. But applications were very few. During the year 1938, free inoculations were performed at the Laboratory and also at private houses by Laboratory staff. Their figures go to show that this very important preventive measure is not appreciated as it ought to be.

Rosenau, in his book on "Preventive Medicine & Hygiene" says:—"The results of typhoid inoculation can no longer be questioned. The morbidity is lowered in those who have been vaccinated. The most striking effect is in the lowering of the mortality."

Professors Topley and Wilson also speak highly of the value of prophylactic inoculation. In their book on Principles of Bacteriology they write—"The results of anti-typhoid vaccination, specially under war conditions or in localities or communities in which the risk of infections is high, have been eminently satisfactory and there can be little doubt that it offers a highly efficient weapon in combating the spread of typhoid or paratyphoid fever among communities under poorly developed sanitary conditions."

Col. A. C. Chatterjee, Director of Public Health, Bengal in his Foreword to "Typhoid fever in Bengal" says:—"For the civilian population, improvement of general sanitation such as ensuring a supply of good drinking water for the public, better system of drainage and conservancy arrangement and improvement and control of sale of articles of food and drink are all very necessary. But in order to achieve this, both time as well as a large amount of money would be necessary; but in the meantime marked success can be achieved if we concentrate only in one or two methods which are even now practicable, in any case for those who live in Calcutta or in mofussil towns. Of the different methods, I would recommend that at this stage we can concentrate upon two, namely, (a) bedside disinfection and (b) preventive inoculation."

In spite of the fact that Mary Mallon was the most famous typhoid carrier who ever lived, the world knows very little about her. There is the paper in which I announced her discovery, published in the *Journal of the American Medical Association*, June 15, 1907, and the article in which I traced her career up to her final incarceration by the City of New York, eight years later, published in *The Military Surgeon* for July, 1919; but in the innumerable printed references which have appeared in the last thirty years these authoritative sources have generally not been fully utilized. Errors have been committed where one would least expect them and, these being copied and sometimes elaborated on, there have been woven accounts which depart materially from the facts. In my way of thinking the truth about Typhoid Mary is far more interesting than the tales which have been imagined about her, and as all the essential facts have not yet been told, I am glad to tell you some of the things which I think medical men may be interested in.

I first saw Mary Mallon thirty-two years ago, that is, in 1907. She was then about forty years of age and at the height of her physical and mental faculties. She was five feet six inches tall, a blond with clear blue eyes, a healthy colour and a somewhat determined mouth and jaw. Mary had a good figure and might have been called athletic had she not been a little too heavy. She prided herself on her strength and endurance, and at that time and for many years thereafter never spared herself in the exercise of it. Nothing was so distinctive about her as her walk, unless it was her mind. The two had a peculiarity in common. Those who knew her best in the long years of her custody said Mary walked more like a man than a woman and that her mind had a distinctly masculine character also.

I think Mary was born in the north of Ireland. She could write an excellent letter, so far as composition and spelling were concerned. She wrote in a large, clear, bold hand, and with remarkable uniformity. She read a good deal in the days of her captivity and seldom missed her daily paper.

At the time I knew her, Mary had no home. If she had relatives or friends in this country or Europe, she never revealed the fact. Twice I thought I talked with a sister; once in Bridgeport, Connecticut, where my investigations carried me, and once in Brooklyn; but I could not prove it. At the time of her death relatives were advertised for in two newspapers for one month, by order of the Surrogate of Bronx County, and a lawyer was appointed to protect their interests, for Mary left

* Read May 10, 1939 before the Section of Historical and Cultural Medicine, and reproduced from the *Bulletin of the New York Academy of Medicine*, Oct. 1939, page 698.

a little money, but none appeared. None ever came forward when she was sick or in other trouble, and she never sent for any.

My discovery of Typhoid Mary was the outcome of an investigation made in the winter of 1906-07 into an outbreak of typhoid fever in the house of Mrs. George Thompson, at Oyster Bay, N. Y., the preceding summer. The place had been rented to a New York banker, General William Henry Warren, who had occupied it with his family of three, and seven servants for the summer months. Late in August an explosion of typhoid had occurred in which six of the eleven persons in the household were taken sick. The epidemic had been studied immediately after it occurred by persons who were regarded as experts, and there were a number of typewritten reports upon it, but the cause had not been positively ascertained. It was thought by the owner that unless the mystery could be cleared up, it would be impossible to find tenants for the coming season.

It will be remembered that in those days typhoid fever was far more common than it is today and that the knowledge of its transmission was less complete. The reported cases in New York City in 1906 were 3,467 and the reported deaths, 639. The actual amount of typhoid was probably much greater.

Typhoid was believed to be due generally to polluted water or milk, or, in the opinion of some, to putrefying organic matter and sometimes to sewer gas. A paper was presented before the Royal Society by Horrocks at the end of 1906, in which he reported that typhoid and other bacteria might be carried by sewer air after being disengaged from the sewage or walls of the sewers, and the *Journal of the American Medical Association* declared that this possibility should be remembered.

At the end of the century typhoid epidemics, occasionally of hundreds of cases, were occurring in different parts of the country. They were frequent among students of colleges and universities, and now that it is all over it is amusing to see the attempts that were made by college and town authorities to shift the responsibility for them.

Also there were villages and isolated houses to which typhoid clung with inexplicable pertinacity, and solitary cases or small groups appearing here and there in healthy communities for which no explanation could be found.

It was to be Mary Mallon's fare to clear away much of the mystery which surrounded the transmission of typhoid fever and to call attention to the fact that it was often persons rather than things who offered the proper explanation when the disease occurred in endemic, sporadic and epidemic form.

It happened that in 1907 I had had a good deal of experience with typhoid fever. This began when as an undergraduate student passing my Christmas holidays at Warrensburg in the Adirondacks, I had the temerity to move two typhoid patients and their families out of a house which had a long

history of communicable disease and, with the consent of the owner, burn it to the ground. My experience grew with my years. Eventually I was called on to investigate and put a stop to many epidemics, numbering the City of New York and the State of New York among my clients. I was called an epidemic fighter.

When I went to Oyster Bay, the first thing I did was to get together all the essential facts about the outbreak: the dates of attack, the diagnoses, and like information. The next was to check over the possible sources and channels of infection as suspected and studied by preceding investigators. This check up was done with the utmost care, my assumption being that somebody might have overlooked some important detail.

I was disappointed. They had done their work thoroughly. Try as I would, I could not find anything wrong. The nearest explanation was that an old Indian woman who lived on the beach had brought polluted shell-fish to the household, but this theory would not stand the rigorous inquiry which I gave it.

So I turned my attention from the well, the overhead tank, the cesspool, the privy, the manure on the lawn, the food supplies, the bathing and the sanitary condition of the neighboring property to the people in the house. I thought it probable that some event outside of the usual routine in this well regulated household had occurred a little before the outbreak began. Had a carrier come to the house?

The idea of carriers was not entirely new to me. I had taken care to guard against carriers—primary carriers—in my epidemic work. As is well known, a considerable percentage of convalescents pass a highly infected urine for many weeks after they are sufficiently recovered to go about; so I had urotropin put up in convenient form to administer and issued and ordered that no patient might be discharged from medical attention until his urine was proved to be bacillus-free.

It was hard to identify typhoid in the faeces by current bacteriological methods. I had read an address which Koch had delivered in 1902 on typhoid investigations in Trier which were based on a paper by Conradi and Drigalski in the same year, setting forth results they had obtained with a new culture medium in examining the stools of apparently well persons. A *Festschrift* on the sixtieth birthday of Koch, which appeared in 1903, contains several papers on the probable role of healthy carriers in producing typhoid, and publications by others in Germany were to like effect. Most of these I had not seen until Dr. Simon Flexner called my attention to them after I had concluded my work on the Mary Mallon case.

Nothing of the kind had been done in America and the discovery of Typhoid Mary brought to light for the first time in America, or any other English-speaking country, a chronic typhoid carrier with infected faeces. This type of carrier is now regarded as by all means the most common.

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Having undertaken to see if there had been any carriers in the Oyster Bay house before the outbreak where occurred, I soon came, through the process of exclusion, to the cook. But where was she? She had left soon after the epidemic and that event had occurred over six months ago. I tried to find out everything I could about her, but there was not much to learn. Mrs. Warren said she was a good plain cook, her wages were forty-five dollars a month, and she had been obtained from Mrs. Stricker's. Stricker's was a well-known employment agency on Twenty-eighth Street. The cook had not fraternized with the other servants and they knew little about her. She was not particularly clean. Her name was Marry Mallon. That was about all.

But some of the details were of great significance. The cook had come to work on August 4, the first person fell ill August 27, and the last September 3. It seemed probable that all of the patients, the dates of whose attacks fell within a period of seven days, were infected at the same time and that this was after the new cook's arrival.

It was not at first clear how the family could have been infected from the cook, granting that she was a carrier, for, where there are so many servants, there is little food that a cook handles which is not subsequently raised to a temperature sufficient to make it harmless. I found however, that on a certain Sunday there was a dessert which Mary prepared and of which everybody present was extremely fond. This was ice-cream with fresh peaches cut up and frozen in it. I suppose no better way could be found for a cook to cleanse her hands of microbes and infect a family.

I went to the employment agency which had sent the cook and explained the situation. I asked for Mary's references, for I wanted to know where else she had worked. I obtained all the help that could be given there, but it was not very much.

Mary appeared to be a person who moved about a good deal; she did not remain long in any situation. She did not get all her situations through one agency, or any agency for that matter. Sometimes they came through advertisements.

I found some of the places where Marry Mallon had worked and asked if anything unusual had happened there. I would like to describe at length what I learned, but it would take too long. I uncovered a series of seven household epidemics. They were alike in the unexpectedness with which the cases occurred, the complete ignorance as to the source, the apprehension as to who would be next, the suffering of the patients, the disruption of the household arrangements, the general bewilderment. The cook had, of course, never been suspected as the cause of any of these epidemics.

My earliest record places Mary Mallon at Mamaroneck, where a New York family had a house for the summer. A young man made a visit there and came down with typhoid ten days after his arrival. The date was September 4, 1900. At the time it was thought that he had contracted his disease during a visit to East Hampton, because

that place was at no great distance from the Montauk army camp where typhoid was prevalent. No definite route of infection was indicated.

In 1901-'02, Mary lived about eleven months with a family in New York City. A laundress was taken to Roosevelt Hospital with typhoid, December 9, 1901. The case was seen by Dr. R. J. Carlisle, but not investigated.

In 1902 Mary was taken to Dark Harbor, Maine, to a new house that had been rented for the summer by Coleman Drayton, a lawyer of New York City. A case of typhoid fever occurred June 17, two weeks after the cook's arrival. Seven days later a second case occurred. Two days after that there was a third. Soon seven out of the household of nine were sick, the only two escaping being Mr. Drayton, who had had typhoid some years before and was presumably immune, and the cook. A trained nurse followed and a woman who came to work by the day was attacked. The outbreak was investigated at the time by Dr. E. A. Daniels of Boston and Dr. Louis Starr of Philadelphia. The first case was that of a footman; some believed that he had become infected outside and brought the sickness to the house. Dr. Daniels thought the first three cases were simultaneously infected somewhere; but on checking over his report I could not agree with him. I found that the three had not eaten the same food or drunk the same water.

As may be imagined, the household was pretty well upset. Proper help could not be had. Mr. Drayton and Mary Mallon worked side by side taking care of the sick and attending to all the manifold tasks which illness brings upon a family. Mr. Drayton told me that when it was over he had been so grateful to Mary for all the help she had given him that he rewarded her with fifty dollars in addition to her full wages.

In 1904 Mary figured in an outbreak in the household of Mr. Henry Gilsey at Sands Point, Long Island. There were, all told, eleven persons on the place: four in the family and seven servants. The cook arrived on June 1 and on June 8 the laundress, who had been on the place ten days, fell ill of typhoid. Then followed the gardener, the butler's wife, and finally the butler's wife's sister. There were four, all told, who fell ill within three weeks in this outbreak. The cases were all among the servants, and since they lived in a house apart from the family, it was thought that there must be something wrong about their house. Several persons investigated this outbreak, including Dr. R. L. Wilson, superintendent of hospitals for communicable diseases of the New York City Department of Health. His opinion was that the laundress must have become infected before she entered this employment, but, although he tried, he could not find how this could have happened.

After leaving Oyster Bay, Mary Mallon was employed as a cook at Tuxedo. She remained from September 21 to October 27, 1906. Fourteen days after her arrival a laundress was removed

with typhoid to St. Joseph's Hospital at Patterson. She was seen by Dr. E. C. Rushmore.

Here was a curious group of epidemics. In nearly every instance, a well-to-do and socially prominent family, soon after moving from the city to the country for the summer, experienced an outbreak of typhoid fever. In no instance had its cause been satisfactorily explained. The cook always left soon afterward. She had never been suspected.

When at length I caught up with her, which was some four months after I started out on the Oyster Bay epidemic, Mary was working as cook in an old-fashioned, high-stoop house on Park Avenue on the west side, two doors above the church at Sixtieth Street. The laundress had recently been taken to the Presbyterian Hospital with typhoid fever and the only child of the family, a lovely daughter, was dying of it.

I had my first talk with Mary in the kitchen of this house. I suppose it was an unusual kind of interview, particularly when the place is taken into consideration. I was as diplomatic as possible, but I had to say I suspected her of making people sick and that I wanted specimens of her urine, faeces and blood.

It did not take Mary long to react to this suggestion. She seized a carving fork and advanced in my direction. I passed rapidly down the long narrow hall, through the tall iron gate, out through the area and so the sidewalk. I felt rather lucky to escape.

I confessed to myself that I had made a bad start. Apparently Mary did not understand that I wanted to help her. It mattered not that I told her if she would answer my questions and give me the specimens, I would see that she got good medical attention, in case that was called for, and without any cost to her.

As a matter of fact, I did not need the specimens in order to prove that Mary was a focus of typhoid germs. My epidemiological evidence had proved that. Laboriously I had worked out every one of the seven outbreaks and was positive that Mary had produced them all. Just exactly how she did it I didn't know. I wanted to find out. No doubt her hands played a part in it. They became soiled when she visited the toilet, but whether from her urine or faeces I had no way of knowing.

I felt a good deal of responsibility about the case. Under suitable conditions Mary might precipitate a great epidemic.

I found that Mary was in the habit of going, when her work for the day was finished, to a rooming house on Third Avenue below Thirty-third Street, where she was spending the evenings with a disreputable looking man who had a room on the top floor and to whom she was taking food. His headquarters during the day was in a saloon on the corner. I got to be well acquainted with him. He took me to see the room. I should not care to see another like it. It was a place of dirt and disorder. It was not improved by the presence of a large dog of which Mary was said to be very fond.

I made an arrangement with Mary's friend to meet her in this room; and taking an old assistant, Dr. B. Raymond Hoobler, later head of the Children's Hospital at Detroit I waited one evening for Mary at the top of the stairs.

Mary was angry at the unexpected sight of me, and although I recited some well considered speeches committed to memory in advance to make sure she understood what I meant, and that I meant her no harm, I could do nothing with her.

She denied she knew anything about typhoid. She had never had it nor produced it. There had been no more typhoid where she was than anywhere else. There was typhoid fever everywhere. Nobody had ever accused her of causing any cases or had any occasion to do so. Such a thing had never been heard of. She was in perfect health and there was no sign or symptom of any disease about her. And she would not allow anybody to accuse her. Again I saw I was making no headway, so Dr. Hoobler and I left, followed by a volley of imprecations from the head of the stairs.

Learning that Mary was going to leave her Park Avenue situation and knowing that if she did so it would be hard to find her again, I brought her case to the attention of Commissioner Thomas Darlington and Dr. Hermann M. Biggs, Medical Officer of the New York City Health Department, and recommended that Mary Mallon be taken into custody. I wanted to have her excretions examined by Dr. William H. Park at the Department's Research Laboratory. I called Mary a living culture tube and chronic typhoid germ producer. I said she was a proved menace to the community. It was impossible to deal with her in a reasonable and peaceful way, and if the Department meant to examine her, it must be prepared to use force and plenty of it.

The Department acted favorably on my recommendation. It would get the specimens peacefully, if possible, but if this was not possible it would get them anyway.

An inspector in the person of Dr. S. Josephin Baker was sent to see Mary about it. But the success of this gentle yet redoubtable warrior was at first no greater than mine had been. Mary slammed the door in her face.

Next morning a Department of Health ambulance drew up quietly in Sixtieth Street beside the church, with three policemen under Dr. Baker's orders. Two of the policemen were carefully placed so as to prevent Mary from escaping, and one was taken by Dr. Baker with her to the front door. They rang the basement bell and Mary opened the door before she saw who was there. Then she attempted to shut it but the policeman interposed his foot. Mary ran back to the kitchen and disappeared. The doctor and policemen followed quickly, but could not find her. Other servants were there, but they declared they had not seen her. A search was made of the cellar, coal bins and closets, but without result.

On looking out of a rear window Dr. Baker noticed a chair that had been drawn up beside the high fence which separated the property from that

adjoining. The ground was covered with snow, and footprints in it led from the house to the chair. Dr. Baker went into the next house and made a thorough search of it but Mary was not to be found. By this time some three hours had been spent in hunting for her.

Dr. Baker then went out into the street and found another policeman and the search was renewed. The hunt was about to be given up when a bit of gingham was seen caught in the door of an outside closet in the rear of the second house. Asheans were piled against the door. When these were removed, there was Mary. To use Dr. Baker's words:

"She fought and struggled and cursed. I tried to explain to her that I only wanted the specimens and that then she could go back home. She again refused and I told the policemen to pick her up and put her in the ambulance. This we did and the ride down to the hospital was quite a wild one."

A few days later I received a telephone call from Dr. Park, which told me that Mary's bowel movements contained a pure culture of the *Bacillus typhosus*. The examinations were made three times a week from the date of her capture, March 20, to November 16, 1907, and only in a few instances were the typhoid organisms not found.

Some weeks after Mary's arrival at the Willard Parker Hospital, where she had been taken on her arrest, I called on her there. She had been placed in one of the outside isolation wards. In view of her actions when arrested, she was regarded as a dangerous and unreliable person who might try to escape if given a chance. So she was locked up. It was not an attractive or particularly comfortable room and there was no reason why a strong, active woman of forty who felt herself to be in perfect health, should be contented with it. And Mary Mallon was not.

The room, with its white walls and ceiling and floor, the white bed and the white bathrobe which Mary was wearing, gave the curiously healthy and fearfully angry-looking person a startling appearance.

"Mary," I said, "I've come to talk with you and see if between us we cannot get you out of here. When I have asked you to help me before, you have refused and when others have asked you, you have refused them also. You would not be where you are now if you had not been so obstinate. So throw off your wrong-headed idea and be reasonable. Nobody wants to harm you. You say you have never caused a case of typhoid, but I know you have done so. Nobody thinks you have done it purposely. But you have done it just the same. Many people have been made sick and have suffered a great deal; some have died. You refused to give specimens which would help to clear up the trouble. So you were arrested and brought here and the specimens taken in spite of your resistance. They proved what I charged. Now you must surely see how mistaken you were. Don't you acknowledge it?"

Mary looked at me steadily, but neither spoke nor moved. Her eyes gleamed angrily.

"Well," I continued, "I will tell you how you do it. When you go to the toilet the germs which grow within your body get upon your fingers, and when you handle food in cooking they get on the food. People who eat this food swallow the germs and get sick. If you would wash your hands after leaving the toilet and before cooking, there might be no trouble. You don't keep your hands clean enough."

Mary's expression did not change nor did she utter a word. I was bound to tell her all that I had come to say, so I continued.

"The germs are probably growing in your gallbladder. The best way to get rid of them is to get rid of the gallbladder. You don't need a gallbladder any more than you need an appendix. There are many people living without them."

"Mary," I continued, "I don't know how long the Department of Health intends to keep you here. I believe that depends partly on you. I can help you. If you will answer my questions, I will do everything I possibly can to get you out. I will do more than you think. I will write a book about your case. I will not mention your real name: I will carefully hide your identity. I will guarantee that you will get all the profits. It will be easy for you to answer my questions. You know what I want to find out. Above all, I want to know if and when you have had typhoid fever, and how many outbreaks and cases you have seen."

As I finished with my back there against the door Mary rose. She pulled her bathrobe about her and, not taking her eyes off of mine, slowly opened the door of her toilet and vanished within. The door slammed.

There was no need of my waiting. It was apparent that Mary did not intend to speak to me. So I left the place.

It was not long after my third meeting with Mary that she was sent to Riverside Hospital on North Brother Island. There she was given a little bungalow which had been built for the superintendent of nurses. It consisted of a living room, kitchen and bathroom. It was supplied with gas, modern plumbing and electricity. It was pleasantly situated on the river bank, next to the church.

Mary's food was brought to her: she cooked and ate it alone.

About two years after her arrest Mary sued the City for her release under habeas corpus proceedings, a clever lawyer named George Francis O'Neill bringing suit in the Supreme Court. A strong argument was made on Mary's behalf. It was claimed that she had been imprisoned without due process of law. She had, in fact, not been accused of any crime, nor been given a hearing, nor been represented by counsel.

Mary took the stand and testified that she had never had typhoid fever or caused it in others. She was described by the newspaper reports as robust, bright eyed and energetic.

Dr. Park testified that in spite of appearances and her testimony, Mary was a menace to the community; he had found typhoid bacilli in her excrement and Dr. Soper had traced many typhoid

epidemics to her. The judge eventually dismissed the case, saying the Court was unwilling to take the responsibility of releasing her.

When Mary had been incarcerated two years and eleven months, the Health Department released her on her pledge to give up her vocation of cook, not handle the food of others, observe various other precautions and report to the Department every three months. It was believed that she had had an opportunity by this time to learn all about her condition and how to avoid infecting people.

Various attempts had been made to cure her, but nothing had proved effective. The only thing that remained was to remove the gallbladder, where the germ focus was believed to be situated; but, as Mary would not give her consent to this, it was thought nothing more could be done about the matter.

On her release Mary promptly disappeared. She violated every detail of the pledge she had given to the Department of Health. She changed her name and went to cooking again. Under the name of Marie Breshof, and sometimes Mrs. Brown, she now cooked in hotels, restaurants and sanatoria. At one time she ran a cheap rooming house, but kept it so badly that it failed to pay. She tried ironing, but found cooking paid better.

For five years Mary travelled about New York and its vicinity without restraint and without her identity being discovered by the authorities. I was not asked to find her again, but I think I could have done so. My official connection with the case ended when I cleared up the Oyster Bay outbreak in 1907 and turned Typhoid Mary over to the Health Department. Mary's history during these five years has never been traced in detail, but I know some of the places where she worked and some of the things that happened to her.

The world was not very kind to Mary. She could not resume her cooking in rich private families, for practically all of them got their cooks through two agencies—Mrs. Stricker's and Mrs. Seeley's—and both knew Mary and were afraid to place her.

She never had what might be called a permanent situation. She did not get on well with other servants and wanted to be moving about, anyway.

One day her best friend, a man whose name she often went by, sent for her. He was ill with a bad heart. Mary got him into a hospital, where he died.

She injured her hand; it became infected, and she could not cook for several months. This was too bad, for she had no home and she had little money.

She worked in a Broadway restaurant, a hotel at Southampton, an inn at Huntington, a fashionable hotel in New Jersey, and a sanatorium in New Jersey. There were cases of typhoid which she produced, but there is no record of all of them. The list includes two children. There was a man for whom Mary mixed a home-made remedy for indigestion and who soon had to be taken off to the hospital with typhoid fever. It is probable

that she produced a good many cases in her five-year period of liberty.

One day Dr. Edward B. Cragin, head obstetrician and gynecologist at the Sloane Hospital for women, telephoned me asking that I come at once to the hospital to see him about a matter of great importance. When I arrived there he said he had a typhoid epidemic of more than twenty cases on his hand. The other servants had jokingly nicknamed the cook "Typhoid Mary." She was out at the moment, but would I recognize her handwriting if she was really that woman? He handed me a letter from which I saw at once that the cook was indeed Mary Mallon, and I also identified her from his description.

I advised that the Health Department be notified, and it was not long before Mary was again taken and sent to North Brother Island. On this occasion she made no struggle.

Mary was on the island the second time for twenty-three years. During this long period she never once tried to escape. Did she want to regain her liberty after her second arrest? I believe she did not.

Some think she had come to recognize her condition as inevitable and had become reconciled to a life of imprisonment.

My belief is that a change had come over her—a change that was due largely to the passage of time. It was both mental and physical. She felt that she had been hounded because of typhoid fever. She did not admit that there was any typhoid about her, but since others said there was, she had not been allowed to go freely where she pleased and do what she wanted to do. As her lawyer had said, she had been advertised to the world as a dangerous person and had been treated worse than a criminal, and yet she had not been guilty of the least violence toward anybody.

Mary was now about forty-eight years of age and a good deal heavier than she was when she slipped through a kitchen full of servants, jumped the back fence and put up a fight with strong young policemen. She was as strong as ever, but she had lost something of that remarkable energy and activity which had characterized her young days and urged her forward to meet undaunted whatever situation the world presented to her. In these eight years since she was first arrested, she had learned what it was to yield to other wills than her own and to know pain. In the last five years, although she had been free, there had been times when she had found it hard to fight her battles unaided.

On North Brother Island the City afforded her a comfortable place to live—a place where she could cook and sleep and read to her heart's content. Her old age was provided for. There was a good hospital with doctors nearby. She knew by experience that the people on the Island would be kind to her, she could keep them from talking about typhoid fever or asking questions about herself.

Mary possessed a violent temper against which, when fully aroused, few persons had even been willing to contend. I had had this weapon used

against me three times, Dr. Baker had seen it in full force on the occasion of Mary's first arrest, and there is a story of it when an English health officer, neglecting a warning he had received, undertook to interview Mary and photograph her at her bungalow. Mary knew how to throw herself into a state of what Dr. John A. Cahill, Superintendent of Riverside Hospital, called, "almost pathological anger."

In the many years of her incarceration, Mary made good use of this personal weapon. Usually a look or a word gave sufficient warning of what might lie behind. When, on the basis of a long and friendly relation, the head of the laboratory asked Mary to tell her about her love affairs, Mary silenced her with a glare.

When Mary returned to North Brother Island she had reason to think that if she showed she would not run away, she might get permission to visit the mainland, and could then see her old haunts in the East Thirty-third Street region, the shops and the streets and the other sights of the city. She could mingle with the crowd as though she belonged to it—as she felt she did.

Whether all this was planned by Mary I do not know, but the fact is she went back to her bungalow and made no fuss about it. She became a privileged guest of the City. Nobody ever talked to her about anything she did not want to talk about. She announced that her past life was a "closed incident," and nobody bothered her about it.

Mary was given a job in the laboratory and learned to make routine simple tests such as all hospitals require. She was paid well for what she did. When she wanted to, she could go to the mainland unattended, and when she came back, nobody made her give an account of herself. Sometimes she would go all the way over to Queens and make a long visit to a family she knew there. They were not particularly glad to see her.

On Christmas morning, 1932, a man who came to deliver something to her found Typhoid Mary on the floor of her bungalow, paralyzed. She had had a stroke of apoplexy and never walked again. Thereafter, for six years, she was taken care of in the hospital.

She died November 11, 1938. Her body was hurried away and buried in a grave bought for the purpose at St. Raymond's Cemetery in the Bronx. There was no autopsy.

The official death certificate states that the diagnosis was terminal bronchopneumonia of seven days' duration, following chronic nephritis and chronic myocarditis of ten years' standing, and that the fact that the deceased had been a typhoid carrier for twenty-four years had been contributory.

The funeral possessed elements of irony as well as pathos. It was an odd climax to the curious career of this remarkable woman. It was held in the large Roman Catholic Church of St. Luke's in 138th Street, the Bronx. Only nine persons were present. Of all those in the City employ who had known Mary Mallon and had seen her come and go for so many years there was not one who followed her to her grave.

FOREIGN MEDICAL NEWS

Our London Letter

(From Our Own Correspondent)

MEDICAL RESEARCH COUNCIL REPORT FOR 1938-39

It is, as usual, a substantial report, and gives a detailed account of the work undertaken under its auspices during the year. It pleads pathetically for the non-curtailling of grant-in-aid owing to the present National Emergency. The report is divided into many chapters, and the work of the clinical research units are well described. Endocrinology, preventive medicine, bio-chemistry and numerous other subjects of topical interest claim attention.

THE FUTURE OF SANATORIA

The first meeting, after the war, of the Joint Tuberculosis Council was held in London on 17th Feb. when the question of the future of Sanatoria was discussed. Dr. Heaf warned that the future tuberculosis activities would be dominated by a rigid financial economy, owing to the increase in the incidence of the disease and the depletion of national finance due to the present war. The disorganisation of tuberculosis work, owing to the emergency medical service, was pointed out by a deputation that waited on the Minister of Health. As a result, the Ministry has provided a new treatment accommodation which may be used as rehabilitation centres. Sir William Jameson told that the ultimate destiny of the new accommodation could not be divorced from new regional schemes of public health activity, and that due attention must be given by the Council to efforts which were being made in other quarters towards the centralizing of medical work on regional basis.

CEREBRO-SPINAL MENINGITIS IN ENGLAND

Of late cerebro-spinal meningitis seems to be on the increase. There was an epidemic prevalence of this disease in 1931 and 1932 when 2200 cases were notified. There was a decline during 1935 and 1936. Subsequently it rose and in 1939 the notified cases were 1500. This rise has apparently taken place in all parts of the country. The new chemo-therapeutic treatment with sulfonamides is being tried successfully. The Ministry of Health

The total number of typhoid cases traced to Mary Mallon was fifty-three and deaths, three. This is not a large toll, compared to the records of some carriers who have since been found. There were doubtless many cases produced by Mary that never came to light.

I could obtain only fragments of her history at the time of my connection with the case, and nobody else seems to have done much to find any more. But if there had been only the Oyster Bay outbreak that was proved to have been caused by her, it would have been enough to make her a woman of mark.

has issued a special memorandum in which are clearly detailed the signs and symptoms of this disease. The memorandum recommends M and B 693 to be administered early and in adequate dosage. In severe cases, intramuscular injection is advised.

Our American Letter

(From Our New York Correspondent)

PHARMACOLOGY OF SULFANILAMIDE

Sulfanilamide, or para-aminobenzene-sulfonamide, $\text{So}_2(\text{NH}_2)_2$, is the amide of sulfanilic acid, and occurs as a white, practically odourless, slightly bitter crystalline substance, having a sweetish after-taste. It is soluble in hot water, hot alcohol, and cold acetone, slightly soluble in cold water, and cold alcohol, but insoluble in ether, benzene, and chloroform. The aqueous solution is neutral to litmus.

A survey of the pharmacology and toxicology of this newly discovered substance is given by Henry J. Eilmann, of Mary Manse College of Toledo, Ohio in his recent book on medicolegal and industrial toxicology. Although known for only a relatively short time, sulfanilamide has created quite an interest, and many dyes, closely related to it in chemical composition, have since been isolated on account of their bactericidal action. Prontosil, a derivative of chrysoidin, and sulfapyridine, the latest derivative of sulfanilamide, are the best known and most widely used. Chrysoidin, $\text{C}_2\text{H}_3(\text{NH}_2)_2 \cdot \text{HCl}$, has been known for a long time. It is a reddish, crystalline disinfectant powder, used in washes and gargles. It also coagulates the vibrio cholerae and is used as a test for the latter. In addition, chrysoidin and its derivatives have been used in the textile industry for many years for the purpose of colouring cotton, wool, and silk, various shades of red, orange, or yellow.

Sulfanilamide, according to Eilmann, has several distinct advantages over prontosil and its derivatives; it has low toxicity, is easy to administer, readily absorbed in the body, and rather inexpensive. It has a direct inhibitory action on hemolytic streptococci *in vitro*, whereas prontosil has no such effect, although it is possible that sulfanilamide is produced in the body from prontosil by the decomposition of the dye.

Sulfanilamide has been accepted by the Council on Pharmacy and Chemistry of The American Medical Association for the treatment of infections due to beta hemolytic streptococci, but its action has been found effective also in a number of other infections, such as meningitis, gonorrhoea, and other urinary tract infections. On the other hand, sulfapyridine, the new sulfanilamide derivative, seems to me more effective in other infections, especially pneumococci, staphylococci, and B. Friedlander infections. It is especially recommended in the treatment of lobar pneumonia, caused by types I, II, III, V, VII and VIII

pneumococcus. Whereas sulfanilamide is readily absorbed and quite rapidly eliminated by the kidneys, sulfapyridine is irregularly absorbed and only slowly excreted.

TOXICITY

The toxic effects which may occur following the administration of sulfanilamide, prontosil, sulfapyridine and related compounds, may be the result of either its indiscriminate use or of a special susceptibility to it on the part of the patient. The mild symptoms usually consist of general malaise, anorexia, headache, a ringing in the ears, vertigo, nausea, diarrhoea, cyanosis, and dyspnoea. The more toxic effects show the same symptoms: cyanosis is more marked and dyspnoea is more distressing. The more severe cases may show, in addition, a numbness and tingling of the hands, scarlatinal rash, severe abdominal pain, hyper-pyrexia, acidosis, pains in the chest, paroxysmal tachycardia, and persistent dyspnoea. Cyanosis seems to be one of the most common symptoms and is encountered in about 75% of all patients receiving the drug. Jaundice can occasionally be seen, and anaemia may result from prolonged administration of sulfanilamide. As most of these anemias are fairly resistant to ordinary treatment, blood transfusions often must be resorted to.

ABSORPTION AND EXCRETION

Sulfanilamide is quite rapidly excreted by the kidneys. According to Eilmann's book, within four to five hours following its administration practically 95% of the drug is eliminated in the urine. Best results are obtained by maintaining a blood concentration of from 5 to 8 milligrams per 100 c. c. of whole blood, although such a high concentration cannot always be obtained on account of a special susceptibility an individual may have for this drug. The most reliable information as to the blood concentration is obtained by taking blood samples always exactly at the same time, for instance, one hour following the last administration.

To determine sulfanilamide blood concentration, transfer 27 c. c. of 95% ethyl alcohol to a small flask and add slowly with constant shaking 3 c. c. of oxalated blood. Stopper the flask and allow to stand for ten minutes or longer at room temperature—filter and transfer 10 c. c. of clear filtrate to another small flask. Add consecutively 5.0 c. c. distilled water, 2.0 c. c. N 10 hydrochloric acid, and 1.0 c. c. 0.1% sodium nitrite solution (freshly prepared). Set aside.

Now prepare an appropriate Standard by adding 1.0 c. c. of the standard sulfanilamide solution to 9.0 c. c. of 95% alcohol and then treating this solution the same as the blood filtrate. Allow to stand for five minutes. Now add to both flasks, Standard as Unknown, 1.0 c. c. dimethyl-a-naphthylamine. Allow to stand for about fifteen minutes. If turbidity develops in the Unknown,

filter and then compare in colorimeter. Calculation:

$$\frac{\text{Standard } x \times x 100}{3 \times \text{Unknown}} = \text{mg. of sulfanilamide per 100 c. c.}$$

wherein x represents mg. of sulfanilamide in Standard.

CHEMOTHERAPY AND SERUM THERAPY IN PNEUMONIA

The clinical evidence furnished thus far establishes the efficacy of both serotherapy and the new chemotherapy in lowering the death rate from pneumococcal pneumonia. The relative value of the two methods and the indications for their employment, as well as for the combined use of the two, await further clinical studies.

This is the conclusion of an editorial of the Journal of the American Medical Association concerning the comparative value of both methods. The mortality rate of pneumococcal pneumonia, when treated by the type specific serum, has been reported from various sources to be between 2 and 10 per cent. Certain minor disadvantages are listed by Bullow as follows: (1) Serum administered must be specific for the infecting type; (2) some types, such as pneumococcal type III, are resistant to serum; (3) serum must be given intravenously; (4) there is a possibility of anaphylaxis, thermal reactions and serum sickness; (5) serum therapy is expensive.

In 1938, Whitty reported striking results obtained in experimental pneumococcal infections of mice with sulfapyridine. Evans and Gaisford reported 100 cases of lobar pneumonia treated with sulfapyridine. The mortality rate in their experience was 8 per cent as compared with 27 per cent in a controlled series observed at the same time. Favourable results have been reported by other authors. Finland and his co-workers reported a mortality of 22 per cent in a group treated with sulfapyridine alone. In similar cases treated without specific serums or drugs the expected fatality rate is between 75 and 90 per cent; with specific serums alone it is from 50 to 60 per cent (The group consisted of a greater proportion of older patients and incidence of bacteremia).

In a study of Dowling and Abernethy the total mortality rate for the serum treated group was 16.7 per cent, while that for the sulfapyridine treated group was 11 per cent. The mortality rate among the patients to whom the serum was administered during the first four days was 10.8 per cent. The mortality rate among patients receiving sulfapyridine during the first four days was less than 3 per cent. Sulfapyridine seemed to be more effective for older patients and for patients with involvement of two or more lobes, while the two agents seemed to be of equal value in bacteremic cases.

SALES OF ARSENICAL DRUGS AND SYPHILIS

An interesting calculation has been given by R. A. Vonderlehr, Assistant Surgeon General, United States Public Health Service, concerning advances in the control of syphilis and gonorrhoea under the provisions of the Venereal Disease

Control Act. He found out the number of doses of arsenical drugs, reported to have been sold in the United States. For the calendar year 1933, the number of doses was 5,787,000. For the calendar year 1938, the last year for which we have information, the number was 10,656,000, or approximately twice as many. The figures contain average doses arsphenamine (salvarsan) 0.3 mg.; average dose silverarsphenamine, sulpharsphenamine, neosilverarsphenamine, etc. 0.2 gm.; average dose neoarsphenamine 0.5 gm. average dose mapharsen 0.05 gm. The increase was continuous during the single years 1933 to 1938.

We know, however, says Vonderlehr, that the job isn't being done nearly as well as it should be done because theoretically if the half-million people with new infections who go to doctors each year were treated adequately, it would require more than 15,000,000 doses (at 30 doses per case) and yet only 10,000,000 are sold. So from the standpoint of early syphilis alone treatment would be only two-thirds complete, if all these doses were given to them. In addition there would still remain the great numbers of people who should be treated for latent and late syphilis.

CANCER REPORTABLE

Reporting of cancer to the New York State department of health was begun on January 1. The law requires that cases be reported by every physician who sees a case of cancer or other malignant tumor: every hospital, dispensary or related institution to which such a case is admitted and every laboratory in which a tissue diagnosis of cancer or other malignant tumor is made. It is believed that reporting will make available data that will be of value in the control program, such as whether or not cancer is actually increasing, in what sections and among what groups it is most prevalent.

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INDIAN MEDICAL NEWS

(From Our Own Correspondent)

A REVIEW OF THE INDIGENOUS DRUGS INQUIRY

Advancement in knowledge of the pharmacopoeial and allied drugs produced in India and development of local drugs manufacture, bringing prices within easy reach of large masses in India—these are some of the achievements claimed for the study, now completed, of a large number of Indian medicinal plants under the Indian Indigenous Drugs Enquiry Scheme, financed by the Indian Research Fund Association, according to a Review just published by the Association. The study ranged over a wide field from the isolation of the active principles to tests of action on animals and, in suitable preparations, on patients.

A number of manufacturing firms have come into existence and instead of concentrated extracts which were formerly imported, practically all kinds of galenic preparations, powders, etc., are now being manufactured in India, in many cases, from material locally produced. The growth of the pharmaceutical industry has, in its turn, stimulated the manufacture of solvents such as alcohol, chloroform, ether, benzene and many coal-tar products used in medicine.

GREATER DEMAND FOR INDIGENOUS MATERIAL

There is now greater demand for indigenous raw material and with this increase in demand, there has been an increase in the area under drug cultivation. Belladonna, digitalis, hyoscyamus, squills, colchicum, gentian, artemisia, juniper, valerian, podophyllum, colocynth, ephedra, pyrethrum, etc., are a few of the drugs which have come into more extensive use. Raw products of good quality are now more easily available at reasonable prices and the export of crude drugs such as belladonna, ephedra, podophyllum, chaunmoogra, castor oil seeds, etc., has considerably gone up.

Simultaneously, attempts are being made to grow the plants in such a manner that the maximum quantity of active principles can be obtained, while to overcome difficulties in identification a herbarium of medicinal plants is being got ready. Digitalis, ipecacuanha, pyrethrum are some of the important drugs, the cultivation of which is being thus encouraged. It is hoped that with proper development, India will not only be able to meet her requirements of medicinal herbs and drugs but also have a large residue for export.

The researches have done much to prove or disprove, by the application of modern methods, the therapeutic value of many drugs used in indigenous medicine. Of the drugs, the efficacy of which has been proved, Isabgul (*Plantago ovata*), Kurehi (*Holarrhena antidysenterica*), Sarpagandha (*Rauwolfia serpentina*), Bouchi (*Psoralea corylifolia*), Kuth root (*Saussurea lappa*), cobra venom, are a

few which may now be admitted into the Indian Addendum to the Pharmacopoeia and, later, into the Indian Pharmacopoeia. On the other hand, a number of drugs, which were in the old addendum, have been shown to be worthless.

STUDY OF POISONOUS PLANTS

As a natural corollary to work on the medicinal plants, a systematic study has been undertaken of the poisonous plants growing in India. The work is of importance not merely to the medical profession, but also to the veterinarian and to those interested in livestock. The toxic effects of plants in common use, such as, aconite, barringtonia, calotropis, nerium, etc., have been worked out, and steps taken to warn people against their indiscriminate use by unqualified practitioners.

Some common food poisons, such as Khosari dal (*Lathyrus sativus*), Indian millet (*Sorghum vulgare*), Sialkanta seeds (*Argemone mexicana*), which have been responsible for serious outbreaks of poisoning in men and animals, have also been studied. Only the fringes, however, of this vast problem of poisonous plants and food poisons have so far been touched.

Investigations have also been made on the diagnosis and treatment of such diseases as malaria, amoebic dysentery, kalaazar, filariasis, diabetes, etc. In order to find out whether climatic factors and variability of the strains of parasites make any difference in the effectiveness of drugs, indigenous drugs as well as drugs and synthetic preparations manufactured in India and abroad have been subjected to careful tests. The minimum effective doses of antimalarial and other drugs, required to bring about disinfection of the patient in a reasonably short time, are being worked out, so that treatment may be carried out with the minimum of expense.

TOWARDS AN INDIAN PHARMACOPOEIA

The Indian Indigenous Drugs Enquiry was started in 1926 at the School of Tropical Medicine, Calcutta, with its well-equipped pharmacological and chemical laboratories, where the chemical composition of crude drugs could be determined and their biological action on living tissues evaluated. The clinical testing of drugs were carried out at the Carmichael Hospital for Tropical Diseases which is attached to the Tropical School at its research hospital, the only one of its kind in the East.

The main objects which the enquiry had in view, were to make India, as far as possible, self-supporting in her supply of drugs by making possible the utilization of indigenous drugs in a form suitable for administration; to discover remedies suitable for application by exponents of Western medicine from among those claimed to be of high value by Ayurvedic, Tibbi and other indigenous systems of medicine; to find out means by which efficacious remedies could be brought within the reach even of the poor, and finally to prepare an Indian Pharmacopoeia.

The Indigenous Drugs Enquiry brought to light the true state of affairs with regard to the quality

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of drugs on the market in India and, eventually, led to the appointment of the Drugs Enquiry Committee and finally to the establishment of the Biochemical Standardization Laboratory of the Government of India.

The pioneer work of the Indian Research Fund Association has also given an impetus to research on Indian medicinal plants in many places in India. Investigations have been started in the universities and colleges at centres such as Calcutta, Bombay, Dacca, Patna, Allahabad, Lahore, Madras and Trivandrum.

DR. RAJAN ON THE FUTURE OF MEDICAL PROFESSION IN INDIA

Speaking on the "Future of the Profession" at the Madura Medical Association on April 28, 1940, Dr. Rajan said that how humanity was going to fulfil its mission in the world would depend upon what the present day was going to make of the future. In that new order of things he urged that medical men should organise themselves as a body, enlighten the people with regard to scientific subjects, particularly medicine and public health, and advise the Government properly.

Continuing, Dr. Rajan explained how medical opinion was consulted in democratic countries like England while in their country it was very difficult for the Indian Medical Association to have any effective voice as that of the General Medical Council of Great Britain. They had now a Medical Council Act, which was both a disgrace to the Act itself and to the Legislature and to the Government that passed it. For, in civilised countries, people would laugh at a Medical Council which had no register of its own. Would that happen in any civilised country of the West? Yet the All-India Medical Council took upon itself all powers to decide the future of the profession in the country.

Secondly, Dr. Rajan asked, were they going to crowd in the cities cutting each other's throat in a competitive spirit? Or were they going to settle down in villages? Medical men were instruments through whom the helpless had to be helped. In that endeavour they should soon find their place. The future of the profession should be in villages and not in cities. Patriotic medical men, Dr. Rajan said, should find out ways and means to evolve a system of treatment which would be suitable to the life of their people. The speaker explained how the members of the profession could prepare the pharmacopoeia at a cheap rate and gave an account of what he saw at the Ramgarh Congress, where a non-medical man prepared drugs.

Dr. Rajan said that the cost of medical education was enormous at present and that in the democracy of the future, where the State would be under an obligation to extend the benefit of such education even to the poor, things would have to be different. That democracy of the future would again exact services from them and, he, therefore, wished that they should try to fit themselves into the picture and evolve their profession so as to render service to every man and woman in the country.

OBITUARY

Dr. Damodar Gopal Pustake, retired Sub-Assistant Surgeon, Gwalior State, breathed his last on the 16th April, 1940, at Ujjain at the ripe old age of 83. Born at Indore in 1857, the year of the



Great Indian Mutiny and matriculated in the year 1882, he joined the Indore Medical School in the year 1883 and qualified himself as a medical man in the year 1885. Soon after, he joined the Gwalior State Service where he distinguished himself in various capacities. For 32 years he served his State with conspicuous loyalty

and ability. He retired in the year 1915. He spent his retirement in an austere religious life at Ujjain. He leaves behind him two sons: Dr. Pustake and Vakil Pustake. The former is to-day the leader of the medical profession in the city of Gwalior, and the Provincial Secretary, Central India Branch of the All-India Medical Licentiate's Association. The latter is the leader of the bar, and takes great interest in the politics of Gwalior. Dr. Damodar Pustake had the joy and happiness of seeing his sons well on the saddle of life, serving the State and the people with unequalled devotion and zeal. Both of them, like dutiful sons, were nursing him during his last illness, but their filial devotion could not alter the script of destiny, and their father shed his mortal coil, leaving behind him a large number of friends and devoted members of the family to mourn his loss. Dr. Damodar Pustake was a member of the All India Medical Licentiate's Association and as such the Association loses one of its oldest members, and the only consolation is that he left as a legacy to the Association his son Dr. M. D. Pustake who is well-known in the Association circles.

Dr. H. V. Jogayya Sarma of Ellore, a member of our Association for the last 20 years breathed his last on 18th April, 1940. About him Dr. D. V. Venkappa, President of the All-India Medical Licentiate's Association writes:

It is indeed with deep sorrow and concern I have heard of the news of the death of my colleague and fellow worker whose activities in the cause of the Association and for the uplift of the Licentiate's may not be known to the Public to an appreciable extent. He was a member of our organisation for some time having worked up the Ellore branch of which he was the President. After the advent of the Indian Medical Council Act he was one of those who participated against its activities as per the mandate of our Association. All the activities

(Continued at foot of next page)

REPORTS AND REVIEWS

Public Health Report, Assam, for the year 1938: The report remarks that the state of public health as compared to previous years, is not satisfactory. This is due to exceptional floods that prevailed in all parts of the province, resulting in considerable out-breaks of cholera. During the year under review there were 177,767 recorded deaths out of which 11,907 were due to cholera, 1,649 to small-pox, 11,925 to dysentery and diarrhoea, 6874 to respiratory diseases, and the rest to fever and other causes. Every effort was made by the Public Health Department, to stem the tide of epidemics, particularly cholera. But the low-lying and the readily flooded areas permitted massive infection of water and thus made the work of prevention almost futile. Anti-cholera inoculation was, however, pushed vigorously and schemes of protected water supply were put into effect wherever possible. Malaria is said to be the greatest scourge of the province. Rural public health work consisted of (1) protection against cholera by inoculation (2) protection against small-pox by vaccination (3) kala-azar treatment centres (4) distribution of quinine. The report appeals to the Local Bodies to take more active and deterrent action against adulteration of food-stuffs which is reported to be increasing. The geographical position of Assam makes it eminently prone to cholera and malaria. In spite of this, the P. H. Department., Assam, is to be congratulated on the output of its work, and the relative success of many of its enterprises.

Report of an Enquiry into the Causes of Maternal Mortality in Cholera (Health Bulletin No. 27) by M. I. Neal Edwards. Published by the Manager of Publications, Delhi. Price Rs. 1/- or 1 s. 6 d.

This enquiry was financed by the Indian Research Fund Association, and the area of enquiry was confined to Calcutta. The criterion of maternal death was taken to be that which "occurred during pregnancy, or within four weeks after the termination of pregnancy, or later if illness originated during pregnancy, child-birth or the puerperium." The procedure of investigation is detailed. All factors in relation to maternal mortality are discussed and tabulated, including problems of nutrition, prevention, associated diseases, ante-natal and post-natal care. It is on the whole an exhaustive and erudite report. Much of it is not capable of being reduced into a summary. Hence we recommend our readers to go through the original, so that they may understand the complexity of the problem and the erudite nature of the work so ably fulfilled by Dr. Neal Edwards. It is the first authoritative report of the kind on Maternal Mortality in Calcutta, and we hope that similar investi-

(Continued from previous page)

of the branch were due to him and latterly he took great pains in representing the branch at the Conference of the Mother Association by sending Dr. Fakrudin, another old colleague of the place, to Darbhanga. The Association loses a sincere and silent worker and I deem it my duty to express my appreciation of his services to the class to which he belonged, apart from his manifold services to the city of his birth, the country at large and the Indian National Congress.

gation will soon be made regarding maternal mortality in other provincial capitals. It is heartening to read in her introductory chapter that it is probable that "rural maternal mortality rates (except in areas where such conditions as osteomalacia or anaemia are very common) will be found to be lower than urban rates." We hope this proves to be true.

Instructions for collecting and forwarding mosquitoes (Health Bulletin No. 13) by Dr. I. M. Puri. Published by the Manager of Publications, Delhi. Price As. 8 or 9 d.

This book deals with collection and preservation of mosquitoes in all phases of their lives, describes the breeding places with astonishing accuracy, and details all the laboratory technique with precision and simplicity. It is indeed an invaluable guide to workers in malaria survey and to those who are engaged in the study of mosquitoes.

Birth Control: Why, When and How by Dr. B. L. Raina with a foreword by Lord Horder, and an introduction by Lt.-Col. Sir James Robert. Publishers: New Book Company, Bombay.

This book is obviously not a propaganda literature but is intended to be a serious and thoughtful contribution on the subject of birth control. He rightly warns the reader that birth control does not imply reckless and indiscriminate contraception. It aims, he writes, mainly at rational spacing of births, and its total prevention only in such cases in which pregnancy is either detrimental to the health of the mother or is beyond the economic resources of the parents. That the author is not a purblind enthusiast of birth control is evident from what he writes: "Given the necessary economic facilities let individuals have children and have them in plenty, and thereby enrich the race to which they belong." There is no doubt that our country is in need of controlling her births, since her ever increasing population has to be checked lest colonisation raise political conflicts, as indeed such conflicts are already visible in South Africa, Burma and Malaya. As to when and how contraception has to be practised, the author gives a clear and unprejudiced account. We heartily recommend the book to our readers, particularly to those against birth control since the forceful plea of Dr. Raina is bound to convince them of its utility under the existing political, social and economic conditions in our country.

Common Mistakes of Surgery in India by Lt. Col. A. N. Palit. Publishers: Book Company, Calcutta. Price Rs. 5 .

This is a kind of book which, in the opinion of the reviewer, is needed most by the practitioners, because, as the author himself points out, clinical and practical surgery in many of our medical colleges and schools is often neglected and leaves much to be desired. Nor are there any postgraduate facilities for the practitioners to brush up their knowledge. We therefore warmly welcome this book which deals with practical surgery, aims to correct many misconceptions, and summarises with astonishing brevity the essentials of surgical procedure, diagnosis and treatment. The whole work is based on experience. As such it is bound to make its appeal to the readers. Particularly is this book valuable to the general practitioner as a reference and guide. Written in a simple and direct language, we have found the reading of the book very easy, pleasant and sustaining. The get-up is equally good, although illustrations have not come off well. We wish this publication every success, and we are sure that the practitioners would be benefited by it.

EXTRACTS

Epitome of Indian Medical Literature

INDIAN MEDICAL GAZETTE, MARCH 1940

Aortic Stenosis—Gerard Kelley—p. 129.
*Nicotinic acid in Pellagra and allied conditions—Goodall—p. 147.

Experiences with diseases of the gall-bladder—Kaikini—p. 153.

The adult of microfilaria malayi brug—Sundararao and Maplestone—p. 159.

Topical application of sulphanilamide—Dey—p. 161.

*20 cases were treated with nicotinic acid and for the purpose of study. Goodall divides them into 3 groups: (1) Cases of true pellagra (2) Cases of nicotinic acid deficiency (3) Miscellaneous cases such as scabies, rheumatism, etc. The author suggests that pellagra is quite a common disease in Bengal, and that there are a much larger group of cases, specially among Anglo-Indians, showing such symptoms as sore-tongue, anorexia, stomatitis, diarrhoea and mental dullness which respond well to nicotinic acid. Even scabies showed improvement under this treatment. Treatment with nicotinic acid consists, generally, of a course of six intravenous injections of 2 c. cm. followed by two tablets thrice daily. The treatment is combined with the administration of ferrous sulphate and mixed well-balanced diet.

INDIAN MEDICAL GAZETTE, APRIL 1940

*Comparison of thymol and some other drugs in the treatment of hook-worm infection—Maplestone—p. 193.

*Haffkinine-an atelrin-like compound prepared in India—Chopra—p. 200.

Idiopathic hypochromic anaemia—Das Gupta—p. 204.
Typhus fever in Bombay—Patel—p. 208.

Role of x-ray screening in detecting pulmonary tuberculosis—Eisenstaedt and Rindani—p. 210.

Agglutinins after per-oral and subcutaneous vaccination by T.A.B. vaccines—Somasekhur—p. 223.

*Maplestone concludes that tetrachlorethylene is a better drug for the treatment of hook-worm infection on the grounds of lower toxicity, lower cost, greater ease of dispensing, less time taken in completing a treatment and greater efficiency. In the present study the author employed the following drugs for the purpose of comparison: thymol, tetrachlorethylene, and tetrachlorethylene and oil of chenopodium.

Central Fixation as an Aid to Eye-sight by R. S. Agarwal, Delhi, Price Re. 1/-.

Central fixation is the secret of the procedure in the treatment of imperfect sight without glasses, and the book under review deals with it in such a way as the patients would feel it quite easy to practise. The author defines central fixation thus: When the normal eye sees a thing, it sees only that part of the thing best on which it fixes itself and the other parts not so well. This is called Central Fixation. Different exercises are prescribed to achieve the object of Central Fixation in full measure. Dr. Agarwal's persistent zeal and accumulating experience has made him a pioneer in India in the matter of treatment of imperfect eye-sight without glass, and although he is now ploughing a lonely furrow, yet he may ere-long be recognised as one who has contributed much to the restoration of natural methods of healing defective eye-sight.

*Haffkinine (renamed Acriquine) is an acridine derivative prepared by the Haffkine Institute, Bombay, and Chopra finds it as effective as atelrin in the treatment of Indian strains of malaria. The drug is effective in doses of 0.1 gramme three times a day, the course lasting for 5 days and taking a total of 1.5 gm. of the drug for the cure.

CAL. MED. JOUR., JAN., FEB. AND MARCH 1940

Popularising autopsies—Tribedi—p. 1.

*Some biochemical findings in cases of anaemia of pregnancy and in normal pregnancy in Bengal—Hemendra Nath Chatterjee and Mohan Ghosh—p. 11.

Prognosis in certain obstetric condition—Subodh Mitra—p. 21.

Biochemical examination in certain diseases of the kidney—p. 37.

*A new test for measuring detoxicating efficiencies of liver—Mukerji and Ghose—p. 73.

*Further studies in the biochemistry of anaemia of pregnancy—Chatterjee and Ghosh—p. 87.

Thyroid and macrocytic hyperchromic anaemia—Chatterjee—p. 91.

Social sciences seen through public health—Grant—p. 137.

Some atypical pictures of ch. amoeba—Bose—p. 153.
Care of the expectant mother—Sinha—159.

*Chatterjee and Ghosh find that there is an increase of blood cholesterol in normal pregnancy and a decrease in anaemia of pregnancy. A definite relation is found between the clinical improvement of cases and the high blood cholesterol. Cases with low blood cholesterol show little response to treatment. There is a decrease of the serum albumin and an increase of globulin in all the pregnancy anaemia cases, as well as in 3/4 of the normal pregnancy cases. The Vanden Bergh test is negative in 60% of cases of normal pregnancy and between 60 and 100% in the milder cases of pregnancy anaemia. It is found that with the increase in the severity of anaemia the reaction becomes first indirect and then biphasic. There is azotemia and chloride retention, and these may probably be co-related to low blood cholesterol. There is an increase of the globulin in the normal pregnancy cases but the rise in cases of pregnancy anaemia is more remarkable. There is an increase of total cholesterol in cases of normal pregnancy, but there is a marked diminution of the same in pregnancy anaemia.

*Mukherji and Gosh suggest that the difference in the level of free chloral elimination in blood and urine may be used as a measure of liver function in human cases. They describe the test fully and plead for its more extended clinical and laboratory trials.

CAL. MED. REVIEW, MARCH 1940

*Merits and demerits of old and new insulin in diabetes mellitus—Sengupta—p. 367.

Peripheral circulatory failure—Muktesh Nath Basu—p. 383.

Treatment of urticaria—Probodh K. Banerjee—p. 387.

*Discussing the question whether insulin effects a cure, during the course of his article, Sen Gupta refutes the wrong belief that when insulin is withheld or being eliminated the insulin effects wears off and the patient relapses back into his former condition. There is not a vestige of truth in the idea that if insulin is stopped the diabetes is worse than before. The author says that the stoppage of insulin leaves the patient much the same as before or sometimes slightly better in milder cases for the rest it affords to the overstrained pancreas, and there is no deleterious effect even when insulin is used for long periods. The author gives a useful table

of comparison between insulin and protamine zinc insulin, and he prefers to begin treatment with insulin at first and then with protamine zinc insulin for the reason that it gives an idea as to the total number of units necessary to cure a glycaemic patient. Severe cases, however, have to be tackled by a combination of insulin and protamine zinc insulin. But he warns that on changing from old to new insulin, the change over should be made carefully and under close observation.

MEDICAL DIGEST, MARCH 1940

Anomalies of the urinary section—Bahl—p. 67.
Regenerative response of neutrophil after sterodin injection—Battacharya—p. 73.
Our medical problem and foreign degrees—Menzes—p. 76.
MED. BULLETIN, MARCH 16TH AND APRIL 6th, 1940
Acute suppurative otitis media—Mandlik—p. 181.
Transfusion of blood—Gadgil—p. 189.
* Incidence of blood groups—Vaidya—p. 196.
* Peripheral circulatory failure in influenza—Sathe—p. 198.
Pathological conditions of the thyroid gland—Modak—p. 219.
X-ray in the diagnosis of oesophagal lesions—Joshi—p. 223.
Congestive failure of the heart—N. P. V. Iyer—p. 225.
* Darkfield illumination—Vora—p. 231.
Vaidya gives the following incidence of blood groups in Bombay:

Group AB (Mass group 1)	12.5%
Do. A do.	25%
Do. B do.	30.3%
Do. O do.	32.2%

The mechanism of inheritance of four blood groups is explained as follows: (1) Agglutinogens A and B cannot appear in the blood of a child unless present in the blood of one or both parents (2) A parent belonging to group AB cannot give rise to a group O child, and a group O parent cannot give rise to group AB child.

It must be remembered, the author warns, that blood grouping is of value only for excluding paternity and for proving it.

*Sathe gives five illustrative cases of influenza where peripheral circulatory failure were prominent. Two cases died within a few hours of onset of symptoms of failure. Two cases were in a moribund condition but revived. One case showed a mild degree of failure with recovery.

*Vora pleads strongly for the revival of darkfield illumination in the detection of spirochetes in the living condition, since it is the only certain method of diagnosing syphilis in the stage of primary sore.

MEDICAL BULL., 20TH APRIL 1940

Diagnosis and treatment of iritis—Nanavati—p. 257.
Malarial gametogenesis—Athavale—p. 260.
*Early diagnosis of typhoid fever—Dhayagude—p. 263.
*Dr. Dhayagude gives an excellent account of early diagnosis of typhoid fever. He illustrates the pitfalls of a clinical diagnosis of typhoid which is noted for its protein manifestations. In 13 cases of autopsies out of 222 cases clinically diagnosed as enteric 8 proved to be due to one or other of the following diseases: malaria, lobar pneumonia, amoebic abscess, apical pneumonia and syphilitic meningitis. He therefore lays stress on the need for bacteriological diagnosis, and in this connection he recommends early blood culture before the 6th day of the disease.

J.R. OF I.M.A., APRIL 1940

*Pharmacology of saraca indica—Adhya and Roy—p. 299.

Gaseous warfare—Wahed—p. 303.

Treatment of ununited fractures—Sinha—p. 309.

*Saraca (Asoka) has, write Adhya and Roy, a definite stimulant action on uterine contractions, thus justifying the claim of its use as an uterine haemostatic and may be used where ergot is indicated. In ordinary doses it has no action on the heart, blood pressure and respiration but large doses may depress them. This action is probably through sympathetic and not through any direct action on the muscle fibre.

ANTISEPTIC, APRIL 1940

Reactions to arsenic in syphilotherapy—N. V. Chetty—p. 313.
Chlosoma—Maniar—p. 325.
Steinmach's ligature for senile hypertrophy of prostate—Mehta—p. 327.
*Pleurocylisis—Ahamed—p. 331.
Evolution of cataract surgery—Bidyadhar—p. 339.
*Ahamed strongly recommends pleural lavage for chronic empyema, and his article is fully and clearly illustrated. He writes that fever and debility are no contra-indications.

SIND MEDICAL JOURNAL, MARCH 1940

Malaria and Khairpur State—Parwani—p. 148.
*Tuberculosis problem and a few suggestions to tackle it—Kewalramani—p. 153.
*The author gives a brief survey of tuberculosis problem in our country and stresses on tuberculosis survey, compulsory notification and improvement of nutrition.

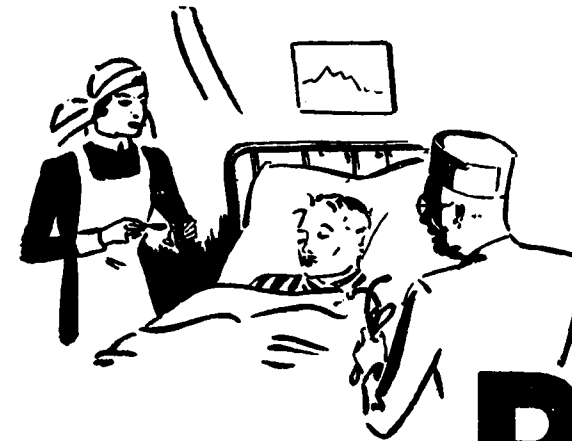
PATNA JOURNAL OF MEDICINE, JANUARY 1940

Analysis of results of treatment of 200 cases with ultra violet rays—Ahamed—p. 1.
Fear—Owen Berkeley Hill—p. 8.
*Treatment of kala-azar by solustibosan—P. N. Laha—p. 11.
Preventible blindness—L. K. Thakur—p. 17.
*Typhoid meteorism successfully treated by Thiamin—Jageswar Prasad—p. 38.
*Dr. Laha gives a full account of 6 cases of kala-azar treated with solustibosan. The injections were given daily by intramuscular route and there were no untoward symptoms or reaction. The temperature came to normal on the sixth day, and the enlargement of liver and spleen was markedly reduced during the course of treatment. There was also a good leucocytic response except in one case.
*Dr. Prasad gives the history of a case, a lady aged 18 years with serological diagnosis of typhoid developing respiratory and cardiac complications. On the top of these, she developed meteorism. He gave Thiamin (Betaxin) intramuscularly. The disappearance of meteorism was simply amazing. After one injection marked improvement was noticed, and the succeeding 2 doses repeated at 12 hrs. interval made the meteorism disappear completely. He attributes recovery to the tonic action on the gut of thiamin.

SPECIAL

INDIAN DENTAL JOURNAL, JUNE 1940

*Urea sulphazide in dental practice—Mewar—p. 21.
*Mewar states that 10 per cent solution of urea sulphazide or ointment of the same strength have been found useful by him in the treatment of pyorrhoea. The pyorrhoea packets are at first lavaged. Then the urea sulphazide solution was put into each packet and allowed to stay for 5 minutes. After drying urea sulphazide paste was packed into the packet. Only 2 or 3 teeth were allowed to be treated at each sitting.



All your patients will readily accept & enjoy

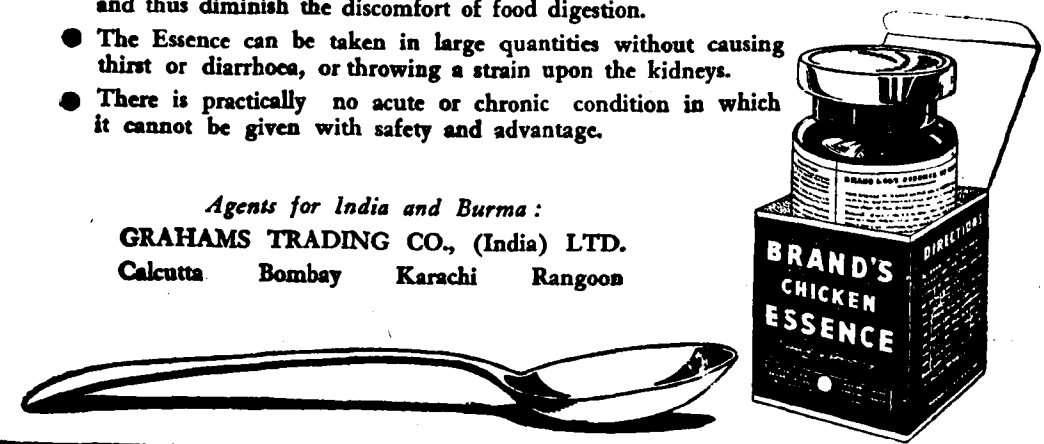
BRAND'S ESSENCE OF ENGLISH CHICKEN

because—

- Brand's Essence is easily and quickly digested without the formation of any solid precipitate—as may occur in the case of milk, raw white of egg, or even the best home-made chicken broth. Where there is gastric insufficiency, full digestion of these fluids sometimes takes many hours.
- This absence of precipitate at all stages of the digestion of Brand's Essence indicates that the system absorbs it with a minimum of effort. The stimulating properties of the Essence take speedy effect owing to the high degree of solubility of the natural protein.
- Even when the gastric juices are enfeebled by acute and chronic disease, there is always enough of the digestive ferments present to deal with the protein present in the Essence. For this reason, it may confidently be prescribed in conditions involving minor degrees of hypochlorhydria.
- Brand's Essence liberates and strengthens the gastric juices. It provokes neither irritation of the delicate lining membranes of the stomach nor the spurious stimulation induced by alcohol and similarly-acting drugs. Most of the resultant free acid is absorbed by the soluble protein. This is present in sufficient quantity to protect the stomach membranes and thus diminish the discomfort of food digestion.
- The Essence can be taken in large quantities without causing thirst or diarrhoea, or throwing a strain upon the kidneys.
- There is practically no acute or chronic condition in which it cannot be given with safety and advantage.

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A matter of Taste

Though many adult patients will not admit their dislike of cod liver oil, children are less inhibited by respect for the physician. And yet this tried therapeutic agent is especially valuable in the East, where diets are often deficient in fats. In vegetarians particularly, distaste for cod liver oil is frequently manifested by inability to retain it in the stomach, or to digest more than a fraction of the dose.

Scott's Emulsion of pure cod Liver oil has a pleasant, saline taste, which is actually liked by children. The fishy taste of the plain oil which so often nauseates vegetarians is entirely absent in Scott's.

Tests made in England have shown that Scott's Emulsion is wholly assimilated within thirty minutes of ingestion, while the digestion of the plain oil only begins after seven hours. Scott's may therefore be prescribed in infancy and for convalescents wherever a deficient diet is suspected or it is desired to encourage rapid tissue-growth.

Composition Data

Scott's Emulsion is based on a biologically standardised cod liver oil, the Vitamin A and D potency of which is fully preserved. The Emulsion also exhibits Calcium and Phosphorus in the form of tonic Hypophosphites. (Note that the calcium is directly utilised in the presence of Vitamin D.)

Common Indications

Scott's Emulsion is successful in cases of: Anaemia; Amenorrhoea; Avitaminosis; Bronchitis; Catarrh, bronchial and gastric; Coughs, Colds, and Croup; Chlorosis; Debility; Dentition; Eczema; Fevers (after); Influenza; Lupus; Marasmus; Nutritional disorders; Parturition (after); Osteomalacia; Phthisis; Psoriasis; Pyorrhoea Alveolaris; Scrofula; Rickets; Strumous conditions; Ulcers; Tuberculous complications; Whooping Cough.

● Literature with full citations of scientific work and publications on Scott's Emulsion will gladly be sent to any medical practitioner on application to Imperial Chemical Industries (India) Ltd., Calcutta, Bombay, Madras, Rangoon or Colombo.

Extracts from Foreign Medical Literature

[The More Important British and American Publications on Typhoid during 1938 and 1939 are extracted below.]

Enteric fever Treated with Supra-renal Cortex extract and Vitamin C Intravenously

(NAJIB-FARAH, *LANCET*, APL 2, 1938, p. 777).

In 15 cases of enteric fever, confirmed by the laboratory, Najib-Farah gave intravenous injections of supra-renal cortex extract in doses between 5 and 20cc, mixed with 500—1000 mg of vitamin C, in the same syringe. This is continued for 5 to 12 days, and no other oral medicine is given except ice bag to the head. The author states that the effect is dramatic from the first injection. There is abundant urination and a gradual fall of temperature between the third and the seventh day. But how this recovery takes place remains a mystery. The author believes that the good result is due to the bactericidal power induced by the injection.

Typhoid Fever: Its Clinical Aspects

(WILLIAM WILLCOX, *B. M. J.*, MAY 21, 1938, p. 1085)

The author gives the history of the disease in Great Britain, and the changes in its clinical features during the last 10 years. Several cases of typhoid fever have been under the author's care in which the appendix and the gall-bladder have been removed in early stages of the illness in consequence of the failure of early diagnosis. Discussing the usual methods of pathological diagnosis he writes that it is important to remember that in some virulent cases the agglutination reaction may show a persistently negative result. As regards treatment he outlines it as follows:

- (1) Vitamin C in the form of fruit juices; vitamin A and D in the form of some liquid preparations; vitamin B as marmite or other suitable preparation.
- (2) Normal saline, by rectum or vein, by drip method in case of severe toxæmia.
- (3) Drugs of all kinds are best avoided except for the symptomatic treatment of complications.
- (4) Hexamine salicylate intravenously for pyelitis, and an alkaline mixture by mouth.
- (5) Antipyretic drugs to be avoided for pyrexia of over 103° but tepid sponging is indicated.
- (6) For intestinal hæmorrhage, a small starch and opium enema or morphine suppository may be given.
- (7) The author is against typhoid vaccine, as in his experience it has given adverse results.
- (8) As regards typhoid serum, he writes that the danger of a prejudicial disturbance of the delicate mechanism of immunity in the human subject appears to outweigh the possibility of benefit.

Typhoid-Endotoxoid Vaccine-Prophylactic

(GRASSET, *B. M. J.*, JULY 8, 1939, p. 58.)

Serological investigation, writes Grasset, have shown that a single injection of typhoid endotoxoid

of high antigenic powers is sufficient to produce in man an agglutination titre as 1:10,000 H and 1:5,000 O without undue reactions. With a view to the possibility of reinforcing the immunity investigations were undertaken with an alum precipitated endotoxoid on the lines of diphtheria immunization. Such precipitated endotoxoid confers upon mice a protection against *vi B. typhosus* at least as strong as that conferred by unmodified endotoxoid. The duration of the immunity is said to last for one year and more.

Typhoid Mistaken for Hepatitis

Br. Med. Jour. quotes Pot and Verhagen (1939) as having recorded a case of a woman, aged 44, in whom the clinical picture was that of hepatitis. *Bacterium paratyphosum A* was cultivated from the bile obtained by duodenal intubation and from the stools, after clinical recovery. But during the disease repeated bacteriological examination of the faeces were negative.

Agglutination Reaction in Typhoid Carriers

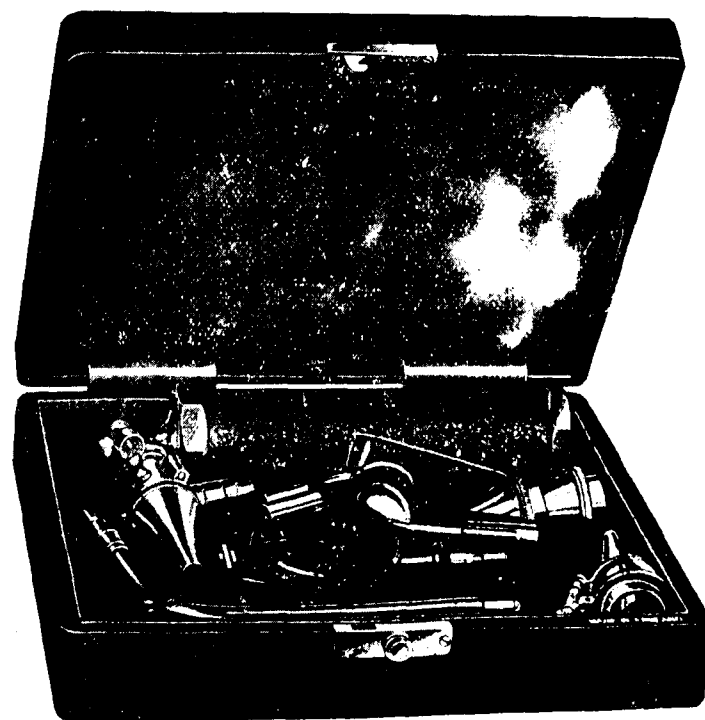
(J. A. MURRY, *Journal of Mental Science*, LONDON, JAN. 1939 p. 126)

The author performed Widal tests on 25 known typhoid carriers. Eleven of one negative blood agglutination reaction at a time when the organism should be recovered from the stools. The author states that a great number of carriers will be detected if bacteriological studies of the stools are always made.

Yellow Typhoid Bacilli

(*Jr. A. M. A.*, EDITORIAL, APL 8, 1939, p. 1346)

The transformation in the test tube of non pathogenic flavobacteria into virulent typhoid bacilli, recently alleged by Dresel and his co-workers of Leipzig, Germany, challenges conventional theories of epidemiology in typhoid. Eight years ago, several strains of yellow bacteria were isolated from urinary samples. By repeated "single cell" cultivation of these flavobacteria non-pigmented variants were eventually obtained morphologically, culturally and antigenically identical with standard strains of *B. typhosus*. Reversing the process, the investigators were able to dissociate from a standard laboratory strain of *B. typhosus* a yellow variant (*Bacterium typhi flavum*). More than sixty species of flavobacteria are recognized by American bacteriologists, most of them regarded as common saprophytes in surface waters. Several strains, however, such as *Flavobacterium fecale* and *Flavobacterium estero-aromaticum*, have been isolated from the intestinal contents of man or as presumptive contaminants from human necropsy material. Medical bacteriologists of the past have usually disregarded these yellow bacteria as of little clinical interest, since none of the known yellow strains had been shown to be pathogenic for man or lower animals. The conclusion of the Leipzig bacteriologists, however, that some species of flavobacteria are merely disguised forms of *Bacillus typhosus* may lead to a critical re-examination of the experimental evidence leading to this conclusion.



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The Intracutaneous Method of Typhoid Vaccination

L. TUFT (*American Journal of Medical Sciences* 199: 84, Jan. 1940) notes that in 1932, in association with Yagle and Rogers, he reported a study of typhoid vaccination by various routes; in this study, the intracutaneous method was found to be most effective for the production of immunity as indicated by the agglutination and complement fixation tests. Further studies have since been made of the effectiveness of the subcutaneous and the intracutaneous injection of typhoid vaccine in producing immunity against typhoid. Both the agglutination test and the mouse protective test were employed. One group of individuals not previously immunized against typhoid were given intracutaneous injections of a typhoid vaccine, 0.1 cc., 0.15 cc. and 0.2 cc. at weekly intervals; and another group subcutaneous injections of the same vaccine, 0.5 cc. 1 cc. and 1 cc. at weekly intervals. The agglutination tests were made on the sera from each group three weeks after the last injection. In both groups the H agglutinin response was good, the intracutaneous group showing a somewhat higher percentage with a titer of 2,560 than the subcutaneous group. In both groups the O agglutinin response was much less, as has been found to be the case with any method of typhoid vaccination by other investigators: the O agglu-

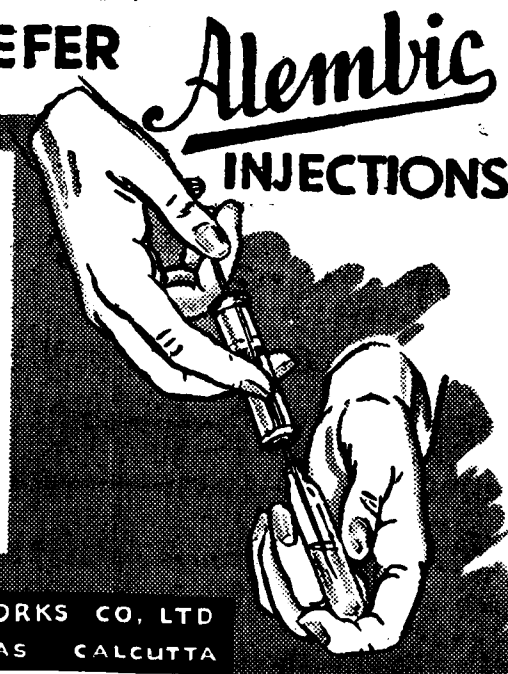
tinating titer was somewhat less in the subcutaneous group than in the intracutaneous group. In the mouse protection test pooled sera from each group were employed. The sera from the group treated intracutaneously had protective power against over 100 minimum lethal doses of typhoid bacilli and slightly less than 500 m.l.d.'s, while the sera from the subcutaneously treated group had protective power against less than 100 m.l.d.'s. In the intracutaneous group the protective power of the sera was definitely greater than that of typhoid convalescent sera. The reactions in the intracutaneous group were slight; the local reactions were mild, causing little or no discomfort; slight nausea, mild vertigo, slight general malaise occurred in one base each, but no other systemic reaction after a total of 168 doses in this group. In the subcutaneous group the local reactions were more marked; headache, fever and malaise lasting forty-eight hours occurred in several cases. These findings confirmed the author's previous conclusions in regard to the efficacy of the intracutaneous typhoid vaccination from an immunological viewpoint. This method has the added advantage of reducing "annoying reactions" to a minimum. On the basis of these results it is claimed that the intracutaneous injection of 0.1 c.c., 0.15 c.c. and 0.2 c.c. of ordinary typhoid vaccine "is the most satisfactory of any of the methods for typhoid immunization and should be more widely used."

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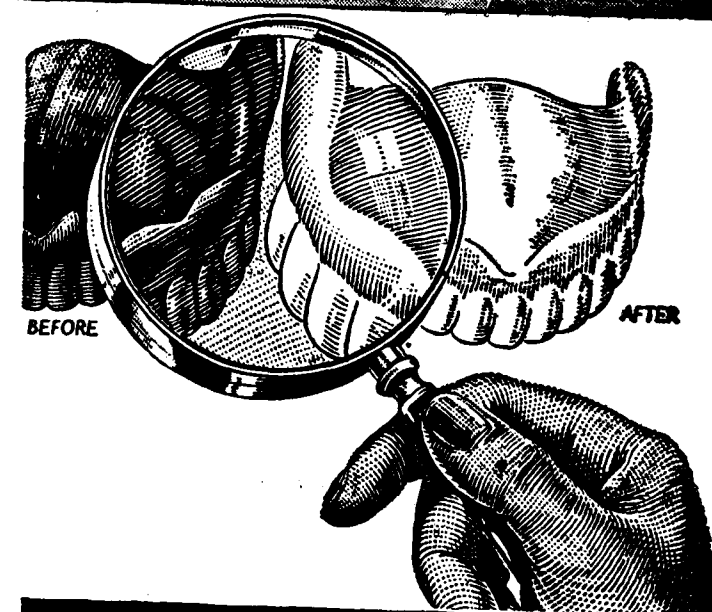
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SUPPLEMENT TO

THE INDIAN MEDICAL JOURNAL

MADRAS

JUNE 15, 1940

Vol. 2, No. 6

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7th Provincial Conference of Medical Licentiates of Bengal, Krishnagar, Nadia

[Amidst scenes of great enthusiasm, Dr. S. C. Mukherjee, M. L. A. opened the Conference on 24th March 1940. Dr. Hari Nath Sen, Chairman of the Reception Committee, welcomed the delegates and the President-elect, Dr. Ahibushan Mukherjee, and while doing so urged the authorities to view the various problems connected with medical licentiates—such as their position in service, the need for uniform standard of medical education in Bengal, facilities for higher and post-graduate education, etc—with serious consideration and genuine sympathy. The Presidential address is a master-piece of its kind—sincere in its tone, broad in its outlook, and practical in its suggestions. Naturally, the address is mainly devoted to the discussion of the imperative need of uniform standard of medical education in Bengal, and the Conference has unanimously accepted his suggestion for the abolition of medical schools and for the institution of one portal system of medical education.]

Both the Chairman of the R. C., and the President condemned the Indian Medical Council Act.

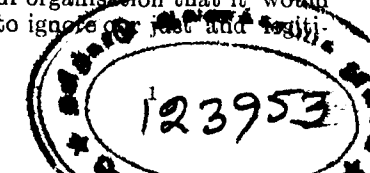
In this connection, we invite the attention of our readers to the Hon'ble Dr. T. S. S. Rajan's speech at the Madras Medical Association published on page 185 of this issue. "We have had a Medical Council Act" he says with his characteristic vigour, "which is both a disgrace to the Act itself and to the legislature and to the Government that passed it...Would that happen in any civilized country of the West? Yet this Council takes upon itself all powers to decide the future of the profession in our country." Ed. I. M. J.]

Dr. Harsha Nath Sen, Chairman of the Reception Committee, said in the Course his Address :

OBJECT OF THE CONFERENCE

Sister and Brother Delegates, it is needless to state in detail the objects of this Conference. The main object of such Conferences is to create unity and *esprit de corps* amongst us, to advance the moral, economic, social and intellectual progress, to maintain the honour, prestige and dignity, to promote the prosperity and to bring to light the wants and drawbacks of our class. It is also the aim of the Association to survey our present condition, to evolve means for bettering

our social and professional position and to make an estimate of the results of our work. Brothren, much is left to be done and we all, whether members or non-members, should join hands and I implore and earnestly pray that Licentiates who are still non-members should at once join the Mother Association and I have every confidence that all Licentiates will, without a single exception, rally round the banner of the Mother Association and make it such a forceful organisation that it would no longer be possible to ignore or just and easily



mate demands and I have not the least doubt that with a united front, win we must. Our Association started in the year 1907 at Bangalore with only a handful of members but now its strength is about 3000 with good many branches all over India, Burma and Ceylon and the balance at credit of the Mother Association now stands at more than Rs. 64 thousands.

As regards Nadia Branch, it was started in the year 1928 with only 5 members, my humble self as president, Dr. K. Roy as Secretary and Dr. B. Bhadra as Asst. Secy., but it is regrettable that out of about 200 Licentiates in this district, only 50 are now members, although Rai Sahib Ram Narayan Lall, the then General Secretary of the Association certified in his annual report at Darbhanga Conference that Nadia Branch stood first in its activity amongst all the Branches in India, which is a glory and honour not only to Nadia but also to Bengal.

IMPROVEMENT OF STUDY IN OUR MEDICAL SCHOOLS

To secure the proper and minimum education for the Licentiates and to entitle them to be recognised as qualified medical men, our Association has been agitating for a long time and in October 1938, a Conference of the representatives of all the Provincial Governments met at Delhi and unanimously accepted the policy of introducing reforms in the curriculum of the medical schools and have also accepted the policy of introducing a minimum standard of medical education in all the Medical Institutions irrespective of their being colleges or schools, to meet the requirements of the I. M. Council. Although in the provinces like Madras, Bombay, Punjab, U. P. and Assam attempts are already going on to fulfil this policy in right earnest, yet unfortunately for Bengal there is no sign of such reform.

INDIAN MEDICAL COUNCIL ACT

The inequitous distinction created by the Indian Medical Council Act has been an "outlawry" perpetuated on the licentiates who though considered as duly qualified in their own province are yet refused recognition by the Indian Medical Council on the plea of inadequate education. But, Sister and Brother Delegates, I must mention here the following extracts from the speeches of His Excellency Lord Chelmsford, the Viceroy and Governor-General of India and many other distinguished high officials, and they speak for themselves whether in any way we are ineligible to be recognised by the Indian Medical Council Act as duly qualified medical men and we must hence shake off the inferiority complex from our minds if there be any.

Lord Chelmsford on the occasion of his opening the Sanitary and Indigenous Drug Exhibition at Delhi on 17th February 1920 remarked:

"Ever since I have been in India I have been hearing of the good though unobtrusive work done by Sub-Asst. Surgeons. Your work lies largely in remote part of this vast country and is performed chiefly amongst the voiceless

masses, it is no doubt for these reasons that the high character of your services is principally known to those amongst whom you work and to your immediate superiors. But those in authority, you be rest assured, are in no way unmindful of what the administration and country owe to you. I cannot think of any report on plague, famine or other epidemic, which I have read without coming on reference to the good work done by the Sub-Asst. Surgeons and your praises are continually sung to me by those responsible for the medical administration of the country. During the Great War you volunteered in large numbers and acquitted yourselves always with credit and often with distinction. Gentlemen, you have a fine record behind you and I can only exhort you to go forward and add to it."

His Excellency the Lt.-Governor of the Punjab observed in an official communique over a decade ago as follows.

"The record established by Mathura Das, a Sub-Asst. Surgeon, is really wonderful. That such skilful operator should be condemned by our system never to be able to rise above the grade of Sub-Asst. Surgeon without going through a college course, is a serious blot on our Medical Administration."

Surgeon-General Stevenson of Bombay on the 20th February 1909, observed, "At the recent Medical Congress we were all struck with the ability of a Hospital Assistant who hailed from the Punjab and who is an honour to the craft to which he belongs. He did work in his dispensary and in his district in such an efficient manner as to do credit even to an officer of the Indian Medical Service. This Dr. Mathura Das of Moga in the Ferozpur District performs some 5 or 6 thousand selected operations every year and always tops the list of operators including the members of the Indian Medical Service. He is an eye specialist and his fame as such has spread not only in India but in Europe and America from where medical men come to see and study his technique of operations for Cataract."

Col. Bryson, a distinguished member of the Indian Medical Service, made the following remarks:—

"Efficiency, patience, loyalty, devotion to duty and a dozen of other attributes belong, beyond question to the Sub-Assistant Surgeon who corresponds in terms of currency to the nickel anna or its equivalent in copper, the coin that serves the multitude and who has thousand times proved that he is a good metal and not a counterfeit."

And there are many other laurels of tribute paid to the Sub-Assistant Surgeon. In April 1907 the proprietors of the Indian Medical Gazette announced a prize of Rs. 100 - to be given to the author of the best Essay on the "best methods of prophylaxis against plague" to be competed for by Assistant Surgeons and Hospital Assistants. The first essay which got the prize was from the pen of a Sub-Assistant Surgeon and the second essay recommended by the Judges was also written by a Sub-Assistant Surgeon.

So, it is obvious, according to Government's own version, that the licentiates are in no way inferior to the medical graduates. Then why this class distinction? Why the doors of Medical College are shut against them in Bengal? And I strongly suggest that:—

(1) Candidates for Provincial Medical Service must be selected by holding an open competition as in England and it is the merit that should be judged. We do not seek any favour, but fair play and equitable justice.

(2) Visiting surgeons and physicians of local hospitals should be selected from the senior and experienced licentiates instead of only from yesterday's medical graduates.

(3) Promotion to the rank of Assistant Surgeons from Sub-Assistant Surgeons should be in the same ratio as promotions are being given by Government from the rank of Assistant Surgeons to that of the rank of Civil Surgeons.

(4) Teachers of Hygiene in H. E. Schools of Mofussils should be selected from our class in the same way as is done in Calcutta and I hope our popular Vice-Chancellor should give a sympathetic consideration in the matter.

(5) Medical Licentiates in the service of Government are put to great hardship in the matter of their allowance, transfer and pay and I hope that proper action would be taken in the matter.

(6) The allowances for epidemic and other duties involving great risk and heavy responsibilities are meagre and that fact should be given a greater consideration.

(7) The Licentiates of the District Boards, Union Boards, Municipalities, Railways, Tea Gardens etc., are smarting under heavy load of grievances as regards pay and prospects, for they are denied even living wages and I fervently appeal to the authorities of each department to keep up the prestige and dignity of the medical profession by grading them on the same line as Government.

Brethren, I hope to be excused mentioning a local matter:—

The District Board authorities of Nadia have removed many of our minor grievances, but our major and vital grievances: *Re.* our new scale of pay which is very low may be revived to the former existing scale. *i. e.*, Rs. 50/- to 80 -.

Brother Delegates, I leave you to move and place before proper authorities, the solving of unemployment question of the LICENTIATES by prohibiting the quacks from practising allopathy, as the number of the qualified Licentiates is increasing and they can now cover up the whole area, Government should stop both the quackery system and also abolish some of the medical schools.

I request all the Licentiates to volunteer their services for military duty in response to the call of the Director-General of Indian Medical Service ungrudgingly.

Brethren, I shall be failing in my duty, if I do not mention here the untimely demise of Dr. Satkari Ganguly of Ranaghat Sub-Division, a retired Sub-Assistant Surgeon of Bengal; whole Nadia deeply mourns, having lost a distinguished practitioner, a patron and one of the founders of the Mother Association.

Sister and Brother Delegates, I cannot but thank you all for the patient hearing and we greatly regret that owing to the poverty of our district we have not been able to accord you a reception in the manner we had wished and there have been many shortcomings in attending to your comforts; but if our purse has been wanting, the sincere and deep regards of our hearts to you are never wanting and it would be some consolation to us, if you would in your generosity excuse us for the inconvenience we have put you to, by inviting you to this poor district town, having not even a medical school.

Before I resume my seat, once again on behalf of the Reception Committee, I offer you a most cordial welcome and request you to proceed with the Conference.

Dr. Ahibushan Mukherjee, President-elect, delivered his address as follows:

I thank you for the honour you have done me, by electing me as the President of this session of the Conference. I am conscious of the heavy responsibilities of this position, which made me diffident to accept it; but on realising that it was a mandate from you, I have agreed to shoulder them. I am here only to obey your call.

The Chairman of the Reception Committee, has very ably put before you the burning topics with which we are concerned and I shall only try to touch some of them.

Before I begin, I must allude to the war which has affected our country as a whole though it is being waged in a country far away from ours. In the last Great War our Association helped the Government with men and money and many of our men had the honour of having rendered distinguished services. We have not lagged behind this time too and so, in the very beginning of the war, our Association has placed its resources at the disposal of the Government of India and telegrams were sent to H.E. the Viceroy and H.E. the Commander-in-Chief in this connection. We have done it on humanitarian grounds, and as a duty towards our mother-land.

Education of the Licentiates

The long-standing grievances of the Licentiates have been often put forward from the press and platforms of this country, as a result of which most of the provinces have gone a long way towards the solution of the problems confronting us. The most noteworthy achievements in this direction have been made in the Province of Madras, where the Subordinate Medical Service no longer exists and where the standard of education in the medical school has been raised to meet the requirements of the Indian Medical Council. I do not know whether these have been possible in Madras, because a Medical Licentiate held the office of the Minister of Public Health!

Our Province of Bengal has been the pioneer of all reforms, social, political, educational and economic; but we have not been able to do anything noteworthy in the matter of improving the system of medical education so far as the licentiates are concerned. I am inclined to believe that this has been due partly to the defects in our organisation and partly to our inactivity and indifference. Otherwise, why is it that when our educational improvements and welfare are so closely linked with the welfare of the masses and improvements in Public Health and Medical relief of our Province, neither the public nor the Government—a Government which derives its authority from the people—should remain supine in the matter of our education? I feel it is our primary and most urgent duty to educate public opinion with a view to apprising the Government of our Province, about the dangers of turning out medical men from inefficient and ill-equipped institutions. In this connection, I cannot resist the temptation of

quoting the following extract from the *Indian Medical Journal*, in its January issue of this year, where the Editor says:—"The Punjab, the United Provinces and Madras have practically fallen in line with the modern trend in medical education. Even the small province of Assam is trying to put the ball of progress into the goal. Sind is not averse to a change for the better, should she find the necessary funds for the same. But what of Bengal? Whenever we think of this Province reverential feelings rise in our breast, because for the last 100 years she has been the mouthpiece of our country, in religion, politics, literature, science and educational and social reforms. We are quite sure that the present elected Government of this Province are conscious of its greatness and are willing to contribute further to its greatness. May we entertain the New Year's hope that they will effect the necessary reforms in the medical school education of their province? Like Bombay, the medical profession in Bengal is unanimous in its demand for such reforms. Will her Health Minister harken to this demand?"

It is quite a gloomy picture of Bengal that has been given by our editor. While the inhabitants of all other provinces in India may avail themselves of better kind of medical aid, the people of Bengal, particularly the masses living in the interior, will have to remain content with the services of medical men, whose attainments, in the opinion of our own Government, are not up to the mark. I shall not criticise the action of any individual or try to embarrass the Government by any unfair and undignified remarks. With all respects for the Government, I must say that the Government itself is in a very embarrassing position with six Government-owned Medical Schools in this province. In the sister provinces, where improvements have already been effected, the number of medical schools is not more than one or two. In an unlucky moment our late Minister Surendranath Banerjee conceived the ambitious idea of opening a medical school in each divisional headquarters without any regard to the quality of these institutions. Little did he know at that time that there would be an Indian Medical Council in future to declare the products of these institutions as unrecognisable practitioners, that the people for whom they were intended would not require them, that the very institutions in which they were taught would not tolerate them and that these medical men would have to take to other occupations for earning their livelihood!

With the addition of four Government Medical Schools to the two already existing, three non-official Medical Schools came into being, and these were duly recognised by the Medical Council of Bengal. Our province thus came to possess nine medical schools, an achievement which none of the other provinces could boast of!! With such multiplicity of medical schools, quality had to be sacrificed, with the result that most of these institutions are perennially faced with threats of disaffiliation by the Bengal Council of Medical Registration. Although our Government is committed

to a policy of improving the medical school education of the province to meet the minimum requirements of the Indian Medical Council, financial considerations have stood in the way of improvements suggested, and the Government have been seriously considering whether some of the Schools should be closed down in order that the remaining ones may continue to exist. Most of the other provinces have solved their problems by introducing a five year course and improving the standard of education complying with the requirements of the Indian Medical Council. But in our unfortunate province no solution can yet be found. Whenever attempts are made to abolish one or other of the existing schools, a difficulty of a peculiar nature presents itself, creating a rather unpleasant situation for the Government. These medical schools exist in some of the Headquarters of some divisions and also districts *viz.*, Burdwan, Jalpaiguri, Chittagong and Mymensingh. Wherever there is a strong agitation for abolition, the people of the affected district Headquarters protest against abolition and somehow or other the matter is postponed. And what is the ground of this popular agitation? It is urged that because of the existence of the Medical School in the district headquarters, the people of the locality get facilities due to the presence of a large number of medical men, laboratories and hospitals. It has been found, in one instance, that even important bodies that agitated most for the continuance of a medical school which was threatened with discontinuance, do not appoint in their services the doctors passed out from the same medical school, when occasions arise. So, it is not so much for supplying a large number of medical men for the district that the schools exist as for the local benefit out of the presence of the staff of the medical schools with the other facilities. I thoroughly agree that each district headquarters should possess a well-equipped laboratory with a hospital staff for the benefit of the public as well as of the medical profession. But there is no reason why a medical school should be attached to it without the necessary equipments.

In all other countries, the best qualified medical men go to the interior, because they have sufficient practical and theoretical knowledge to cope with any case, unaided by any consultation and without the help of a laboratory. Quite contrary is the case in our province, where we urge on the least qualified medical men to settle in villages. It is due to this reason that these medical men also do not like to settle in villages because they are hampered in many ways in their practice. The theory that really qualified men are loath to settle in villages and it is costly for the public to demand their services is an exploded one as, in practice, we find that the graduates of medicine are to-day settling in villages and are even applying for posts in Union Board or Local Board services on a monthly salary of Rs. 30 - or even at a lower remuneration. Moreover, with a uniform standard of education there will be no cause for discrimination in the matter of fees as the number will be far

greater than. The question of higher expenses has also been put forward as an excuse for perpetuating the medical schools with their low standard. This also is a myth, as nowadays the monthly tuition fee of a medical school is Rs. 10/- and that of the medical college is only a little higher than this. The books are the same and cost of living is almost the same. Moreover, there is no dearth of candidates as could be seen from the number of applicants who are refused admission into the medical colleges every year. The preliminary qualification of the medical licentiates are in most cases I. Sc. and so this argument too does not hold water.

We feel that the exigency for which the cheaply educated licentiates were required does not exist now and better class of medical men are required for the country. For a similar reason, the pleadership examination was abolished and at present those who want to qualify themselves for the profession of Law are required to pass the University Law Examination. This has given uniformity to the standard of legal education without increasing the expenses of litigation and similarly there can be no reason to apprehend that medical aid would become much costlier if the standard of education given to the licentiates is raised to the level of Degree Examination.

Friends, I am detaining you long over the question of medical education of the licentiates. But I may claim some indulgence because I feel that this is the only question on which hinges all other problems and difficulties of ours. I feel that even if we pass only one resolution in this Conference over the matter of medical school education, we would be justified in our sitting. I suggest that our duty lies in educating our people in this respect, and in urging on the Government not to go back upon the resolutions of Delhi Medical Education Conference of 1938, and of the P. H. Ministers' Conference of Madras, 1938 and upon the policy declared in these Conferences, which most unambiguously declared in favour of a uniform standard of medical education, meeting the minimum requirements of the Indian Medical Council, to which our Government also is a party.

In this connection, it may be asked as to what should constitute the minimum standard recognisable by the Indian Medical Council. The Indian Medical Council considers this to be a five year course with the training that is now given to the graduates of medicine of the Universities. All the world over, except in Great Britain, the medical training is given by the Universities, while in Great Britain only there are conjoint Boards which are also entrusted with medical education. But the Licentiates of these Boards too are recognised by the General Medical Council of Great Britain. In our country, however, the licentiates are not recognised by the I. M. C. We want to do away with anything that will savour of communalism and so, it has been our policy to support the cause of one portal system and that is through the University alone. This will be the

best remedy for all the ills that beset the profession to-day.

We claim that the licentiates want to enter the medical profession not by sufferance nor through any patronage of any body but only through sheer merit. They pay for their education in the schools quite handsomely and so they have the right to claim for an adequate return; and if they desire to carry on their studies further, proper facilities should be given to them. But at present the Licentiates of Bengal have to work under great disadvantages. The post-graduate training classes are closed against them. The University does not recognise their qualifications and so they have to start afresh in the medical college as new students, if they want to further prosecute their studies. Once a licentiate always a licentiate; and there are no avenues for him to expand his knowledge. I maintain that it is not an act of mercy but justice and fairplay that they demand from the hands of the Government and the removal of these drawbacks and disadvantages thrown in their way. The Government should immediately take upon itself the responsibility of raising the standard as mentioned above and remove the difficulties that beset the licentiates of Bengal. It is a pity that with all the intellectual wealth of our province, with its long history of being fore-runners of all reforms, it should remain so backward in the matter of medical education.

I hope that the popular Government of Bengal and also the alert public will sympathise with the principle of what is right and just, what is good for the present and the future and not what is merely expedient.

Indian Medical Council Act

Friends, it is due to an aberrant and artificially suppressed evolution of the licentiates, as alluded to above, and through forces, to which we, as Indians, have been forced to submit, and also to facilitate the exploitation by the same forces of the Indian Medical profession, that the Indian Medical Council Act of 1933 came into being. Protests from the Indian Medical Profession as a whole had no effect, as the authorities were adamant. The behests of the General Medical Council of Great Britain were carried out sacrificing the children of the soil, I mean the Medical Licentiates, who form the bulk of the profession. No language could be strong enough to condemn it and so, I will restrain myself in commenting on it. Our position is like that of a man who is thrown into a well with his hands and feet tied and then advised jeeringly to make efforts to come up.

Bengal Medical Register

Friends, the Medical Register of our province is a standing disgrace to the medical profession as a whole. There are three divisions in the Register and a Registered Medical Practitioner has to write his own academic qualification along with his registration number, in order that he may be identified. In no country of the world such a

kind of register exists. I maintain that in order to continue the supremacy of the vested interests, the medical profession has been divided into two compartments, so that a third might be wedged in between them. This is how communalism has been introduced in the sacred and noble profession, and with it, internecine jealousies and petty bickerings for loaves and fishes. Fortunately, the Indian medical profession has come to realise it now and the protests of the Indian Medical Association are quite vigorous in these respects. There is every reason why the minimum standard of education should be the same, with facilities for all medical men for higher studies. I appeal to our popular Government to look into this aspect of the matter and amend the Bengal Medical Act correspondingly.

Service conditions of the Licentiatees in Bengal

I have already said that the root cause of all the difficulties and troubles confronting us is the defective system of education at present imparted to the licentiatees and all our woes are due to the vicious circle established by it. We have seen how in the services of the Government, the Medical Licentiatees are daily losing one by one the prize posts hitherto enjoyed by them, because the Government now finds enough better qualified persons on same pay to fill up these posts. The denial of study leave to the Licentiatees by the Government is an indication of the future policy regarding them. They will not be wanted in the future. The conditions imposed on the Licentiatees in service are in a large number of cases ingnomious and degrading. There is therefore serious discontent amongst our Service brethren, whose conditions of life, as I have said already, are becoming more and more helpless. Friends, I remember, when I was a student in the Campbell Medical School, that there used to be actual canvassing for inducing the students to accept Government services at the end of their 3rd year course; and those who would agree to serve the Government for a period of at least 5 years, would get a monthly stipend of Rs. 20/-each, throughout his 4th year course for a period of one year. Look at the picture now. The recruitment from the Licentiatees has gone down to a very miserable percentage and it is very likely that in no distant date this recruitment will stop altogether. Our prospects of services under the District and the Local Boards and in the Railways are equally gloomy. The recruitment from the licentiatees has practically come to a stop, because on the same pay and under the same service conditions, graduates of medicine are available.

This again is due to the system of education in the Medical School, to which I have repeatedly drawn your attention, and all the troubles are but symptoms of one and the same malady. Let me repeat, in this connection, that with the introduction of improved courses of training, as in the province of Madras, the intoler-

able Subordinate Medical Service will be liquidated and in that place single Provincial Medical Service will be introduced.

Medical Relief

With the introduction of the Reforms and with the establishment of popular Government, it was hoped that something tangible will be done towards the improvement of the Public Health of this Province, which has remained unattended to all along. The masses in the interior have been very little benefited by the introduction of reforms in the Hospitals of the District Headquarters and the mofussil districts have derived little benefit by bringing the Calcutta Medical College upto the modern standard. According to the last census of 1931, the urban population of India was 38,979,217 and the rural, 313,858,567. The urban population thus constitutes only 11 per cent of the total and the remaining 89 per cent is rural. This rural population constitutes true Bengal. Rural Bengal is just on the brink of being decimated, and I venture to point out that it is not yet too late and if we still send better medical relief to the interior of Bengal, there is yet a chance of saving the population from hastening decay. Look at the rate of infant mortality; the rate is appalling in Bengal and it is one of the worst affected provinces. Where does this rate obtain? Not in towns, where there are facilities for child and maternity welfare clinics, but in villages.

So, what is wanted to-day is not merely a few ill paid emergency medical men to give nominal relief in times of outbreak of epidemic diseases or malaria, but the adoption of regular systematic preventive measures that are likely to root out disease from our interior. It is the duty of the public, as well as of the Government, to see that the medical men who settle in villages are fully capable to tackle the problems confronting them and are given proper facilities to combat diseases, which though preventible, are eating into the vitals of society and are causing depopulation in the villages. I suggest to our popular Government that money must be found to meet the immediate needs of our people in the interior. The immediate needs consist in the education of our folks in the matters of public health, hygiene, maternity and child welfare, and last but not the least, the necessity for provision of suitable food for our village brethren. Services of medical men in these respects can be requisitioned from the village practitioners, and that will also go a long way in solving the great unemployment problem of the medical men. "Prevention is better than cure", is an excellent motto, but it is no good unless it is put into practice. Our people have every right to claim from our Government protection from diseases, provision of proper food supplies and facilities for better medical aid. I long for the day when medical services will be socialised and when our poor countrymen will not have to suffer helplessly.

Unemployment among the Licentiatees.

This is a very serious problem amongst us to-day. With the Government practically stopping the recruitment for its services from this class, and the other services also following suit, with people caring very little for our class of medical men in private practice, and with a steady increase in their number, the licentiatees are now faced with a serious situation. I have known instances where some of my friends have been compelled to leave the medical profession and have accepted other positions. In the whole of India, the number of qualified medical men, including the foreign-qualified, graduates and licentiatees, would be about 35,000 to 40,000; and at a rough computation there is one doctor for a population of about 10,000. In Bengal, there are more than 10,000 qualified medical men, the population being 51,087,000; so here we have one doctor for about 5,000 people. In addition to these qualified medical men, there are other classes of medical practitioners, who also must be reckoned. Is it any wonder then that there should be unemployment among us? The cry, therefore, that Bengal still needs more doctors, the cry that is raised in certain quarters, deserves little notice. It is true, however, that Bengal requires really qualified doctors.

Indian Medical Association and Ourselves.

Of late, the Indian Medical Association has come into being, comprising all classes of medical men. Hitherto our Association was voicing, as far as possible, the views of the medical profession, of course dealing particularly with the licentiatees. There has arisen a question regarding the amalgamation of our Association with the Indian Medical Association. But I believe that the licentiatees desire to enter the Association only as equal partners and not as inferiors. There are, besides, some outstanding matters concerning ourselves which will compel us to remain a separate entity for some time more. The most important of this is the improvements in the medical schools and bringing them under the purview of the Indian Medical Act of 1933. All the same, we have no reason not to join the Indian Medical Association, when we can try to effect the same improvements from the platform of that Association too. I feel that ultimately there will be no reason for a separate existence of two all-India Medical Associations.

Future of the Licentiatees.

Friends, we have demanded for the immediate abolition of the subordinate service, without any reservation. There might be misapprehension in some minds as to the position of the present Licentiatees. Although, personally, I am of opinion that we should not cherish any selfish idea in our minds that may mar the future of our profession and should submit to any sacrifice that we may be called upon to make, yet, I am sure that we should not have any such misgivings in our minds, as the authorities will be bound to include the licentiatees in the new order that will come to prevail.

I. M. S. Commission and Ourselves.

Friends, I may inform you that at the beginning of this war, members of our class have become eager to join the military services and enquiries are made at our Association headquarters, regarding the possibilities of obtaining the Commission for our class. The Director-General of Indian Medical service has been appraised of this and although no official reply has been forthcoming, we hope that our representation will receive sympathetic consideration and we shall obtain justice. Although there is a chance of our claim being put aside due to our qualifications being non-recognisable by the I. M. Council yet, we believe, these difficulties can be overcome by the exercise of Sec. 121 of Government of India Act of 1935, by which the residual powers of granting commissions to the Indian Medical Service are vested in the Governor-General. This procedure will at once meet the two important demands, in the form of supplying the military needs and of righting the wrongs perpetrated on the Licentiatees for so long a time. The Licentiatees who form the bulk of the civil medical relief of our country may legitimately claim their due share in the Military Services too.

* * * *

Resolutions passed at the Seventh Bengal Provincial Conference of the All-India Medical Licentiatees' Association, held at Krishnagar on 24th and 25th March, 1940.

1. Dr. Ahi Bhushan Mukherji of Burdwan was unanimously elected as President of the Conference.
2. This conference places on record its deep sense of sorrow at the untimely death of Rai Sahib Dr. Satish Chandra Gupta of Jalpaiguri and Dr. Barada Kanta Sen of Dacca and offers its sincere condolence to the members of the bereaved family.
3. This Conference is of opinion that training in modern scientific medicine must be according to the standard laid down by the Medical Council of India and as that standard so laid down corresponds to the University Medical Degree, this Conference is of opinion that in Bengal Presidency there should not be any other medical qualification but that of the University.
4. This Conference therefore requests the Government of Bengal either to raise the standard of training in the Medical Schools to the University Standard or to close down these schools and thus do away with the dual standard of medical training as has rightly been adopted in U. P. and Madras.
5. This Conference views with apprehension the rapid increase of quack practitioners practising allopathic system of medicine in rural and urban areas of Bengal and suggests to the Government to strictly enforce the operation of Poisons Act in Bengal, so that no such person can dispense poisons, and to impose restrictions regarding the use of injections, as in Burma.
6. Resolved that the Government of Bengal be requested to close down the non-affiliated private allopathic medical institutions with a view to check

unhealthy competition from the quacks coming out of these bogus institutions.

Resolved further that the Bengal Medical Council be requested to take disciplinary action against the Registered Medical Practitioners who identify themselves with these institutions.

6. This Conference reiterates its opinion that the rural health units in Bengal be placed in charge of registered medical men in preference to sanitary inspectors, as the former will be able to carry on curative and preventive work simultaneously.

7. This Conference reiterates its request to the Government of Bengal to open at least one Health Unit in each Union, as soon as possible.

8. This Conference reiterates its resolution that the State and Private Hospitals and their institutions be thrown open to all deserving registered medical practitioners for post-graduate training.

9. This Conference reiterates its request to the Government of Bengal to publish transfers and postings of Sub-Assistant Surgeons in Calcutta Gazette for information of the public.

10. Resolved that this Conference is of opinion that although there has been an improvement in the medical school education by splitting the teaching of the two subjects of Physiology and Pathology, with one teacher for each subject, yet it is disappointed to find that the Sub-Assistant Surgeon Teachers who were hitherto teaching the two subjects together with conspicuous ability, and who had gained a good deal of experience in the subjects concerned, should be replaced by two graduates, one for each subject, whose experience in the subjects concerned is not in any way superior to the displaced Sub-Assistant Surgeon Teachers.

Further resolved that the Government be requested to review the matter in the light of the suggestion of this Conference and experienced Sub-Assistant Surgeon Teachers be appointed in the subjects of Physiology and Pathology, as there has arisen a great and genuine discontent over the matter among the members of our Association.

11. Resolved that this Conference is of emphatic opinion that the Indian Medical Council Act be amended in such a manner as to include the Licentiates within its purview.

12. Resolved that this Conference requests the Government of Bengal to amend the Bengal Medical Registration Act in such a manner as it will do away with the existing compartments in the Medical Register and to introduce a system of election composed of the general electorate of all classes of medical men, as in Madras.

13. Resolved that this Conference requests the Government of Bengal to include more members from the Licentiate group in the State Medical Faculty of Bengal.

14. Resolved that this Conference requests the Government of Bengal to increase the percentage of promotions from Sub-Assistant Surgeon to Assistant Surgeon to at least 5 per cent of the total cadre.

15. This Conference disapproves of the action of authorities of the Nadia District Board in reducing

the former scale of pay of its Medical Officers in these days of distress, and requests the said authorities to revert to the old scale of pay.

16. Resolved that this Conference reiterates its protest against the imposition of conditions in the appointment of Licentiates as Teachers of Hygiene in the Secondary and Intermediate Schools of Dacca under the Board of Intermediate and Secondary Education of Dacca while the B. T. and B. S. C. Teachers are appointed to these posts without any such restriction, notwithstanding the fact that the Licentiates' training and qualification in Hygiene and allied subjects are much superior to the latter.

17. This Conference requests the District Board and Municipal authorities of Bengal to revise the scale of pay of the Licentiates in their services according to the Government Standard.

18. This Conference urges upon all the Branches of Bengal, and individual members, to help the local authorities in their organisation of Public Health Welfare centres in their respective jurisdiction, and take active part in public services of this kind.

19. Resolved that Dr. A. N. Roy, B.A., L.M.F., of Calcutta be elected as the Provincial Secretary of Bengal.

A. I. M. L. A. Family Fund

In view of the many inquiries, protests, and complaints received from members either individually or in a body to this Office or to the Superintendent of Insurance at Delhi, the matter was fully considered by the Board of Directors and it was resolved that the following information be given to the members of the Fund through the medium of the I. M. J.

The Family Fund was started in 1911 and registered in Bombay in 1926. The Fund has been transferred from Indore to Bombay a year back. According to the new Insurance Act, 1938, the Fund has stopped working temporarily from 1st July, 1939. According to that Act, the Fund was stated by the Superintendent of Insurance to be on the dividing principles and as such is prohibited from working. In order to continue the Fund according to the new Act, actuary's opinion was taken and he has put in a new scheme on the lines of Insurance. In the meantime, it was thought to see and take the highest legal opinion of the Advocate General, Bombay, whether the Fund can be worked on the old lines and hence the matter was referred to the Advocate General, Bombay. He was of the opinion that the Fund does not come under the purview of the Insurance Act. This legal opinion was communicated to the Superintendent of Insurance who again reiterated his view. The matter has again been referred back to the Advocate General and his views are awaited. On receipt of the views of the Advocate General and the Superintendent of Insurance, Delhi, which might take about three months, opinions of all and individual members regarding the continuance of the Fund, or winding up as per rules or changing it into insurance scheme or any other course that might be hereafter suggested for the fate of the Fund will be taken by calling an Extraordinary General Body Meeting on a day to be communicated later on to the members. Till that time, to curtail the expenses of the Fund, the Board of Directors resolve to discharge the service of the present clerk and peon from 1st June, 1940 and sanction Rs. 10 for the clerical work as an allowance. It further resolves that since the working of the Fund is temporarily stopped the working committee will not function until the matter is settled.

MEDICAL COUNCILS

U. P. Medical Council

Minutes of the meeting of the United Provinces Medical Council held in the committee room of the office of the Inspector-General of Civil Hospitals, United Provinces, at Lucknow, on 18th March, 1940.

1. Resolved that resolution No. 19 of the last meeting, held on 17th November, 1939, be rescinded and that the name of Dr. Ram Saran Das Bejal (Reg. No. 729) be restored to the medical register, free of charge and without obtaining any declaration, as the case is known to Captain Bagechi. Resolved further that no rules on the point are necessary but in future each such case be referred to the Council to be judged on its merit, while the Bengal procedure be followed in the restoration of names removed for want of address. Rest of the minutes be confirmed.

2. Resolved that the name of Dr. Ivy Keess, W. M. S. (Reg. No. 1963), be restored without obtaining a declaration and free of charge, as she is known to Dr. Caul.

3. Government, Medical Department, Notification No. 4071 V—102, dated the 12th December, 1939, nominating Rai Bahadur Dr. Anil Chandra Banerjee, M.B., B.S., D.R.P.H., as a member of this Council was read and recorded.

4. Resolved, with reference to Medical Council resolution No. 16 (12) of November 1939, that Dr. Bir Bhan Bhatia, M.D., M.R.C.P., and Rai Bahadur Captain K. S. Nigam, M.D., F.R.C.S.E., be asked to tender an unqualified regret to this Council and that the regrets expressed by the others be accepted.

5. The request of Dr. Nagendra Nath Lahiri, L.M.P., of Sultanpur for supply of a copy of the complaint and communication of the name of complainant was considered and it was resolved that the information asked for should not be supplied.

6. The action of the President in requesting Government to prosecute, under the Indian Medical Degrees Act, (i) Midwife Mrs. Bala Saxena (*nee* S. Dass) and (ii) Mr. S. S. Singhal, Director, The Indian Medical Society, Aligarh, was confirmed, and it was resolved that that it may be pointed out to Government that this Council has no powers to deal with the case of Mr. Singhal in the manner suggested and that Government should be requested to kindly take further action in the matter.

7. Resolved that the State Medical Faculty be informed that this Council is prepared to restore the name of Mr. Mahmud Ali (late Reg. No. 840) to its medical register if the State Medical Faculty restore his diploma. Mr. Mahmud Ali may then be asked to comply with the formalities.

8. The question whether the present practice of paying travelling allowance should continue to apply to such members as are common to this Council, the State Medical Faculty and the Nurses and Midwives Council for attending the meetings of this Council when held immediately before or after the meetings of either of the two bodies, and the question of framing rules on the point were considered.

Resolved that the whole position be explained to the Government who should be asked to permit the introduction of the same travelling allowance rates in this Council as obtained in the State Medical Faculty.

9. The report of the Standing Committee, which met on 28th February, 1940, was considered to approve their recommendations.

Recommendation No. 1 was accepted subject to the following changes and it was decided that the Bombay Medical Council be informed:

(i) *Delete* the following paragraph from the footnote proposed to be added to item 1(c) of the Code of Medical Ethics, viz.:

"The United Provinces Medical Council takes a similar view of the association of a medical practitioner with any system or method of treatment which is not under medical control and which is advertised in the public press."

(ii) The last paragraph of the proposed footnote should read as follows:

"In the above findings the United Provinces Medical Council does not pretend to interfere with the right of a medical practitioner to be associated (save as above) with any legitimate business enterprise but if such enterprise concerns the sale of a medicine or food the practitioner should not allow his name, professional status or qualifications to be used for advertising purposes outside the medical press."

Recommendation Nos. 2, 3, 5, 6 and 8 were accepted.

Recommendation No. 4 was accepted and it was further resolved that in future no cognizance should be taken of anonymous complaints.

Recommendation No. 7 was accepted and it was further decided that in the case of applicants for registration who have qualified from the institutions in the United Provinces and those registered in the United Kingdom the present practice may continue. Those who have qualified from institutions outside the United Provinces must produce either the diploma or the registration certificate.

10. Letter, dated the 5th December 1939, from Rai Sahib Dr. Ram Narain Lall, L. M. P. F. S. M. F., claiming travelling allowance for a meeting of the Standing Committee which was proposed to be held but subsequently postponed was considered and it was resolved that he may be paid travelling allowance for this journey.

11. The case against Dr. Lal Behari Misra, L. S. M. F. (Reg. No. 2899), of Auraiya was considered and the Council unanimously resolved that no action was called for against Dr. Lal Behari Misra.

12. Resolved that this Council recommends to the Government and the Agra University that while constituting the Agra Medical College they should consider the desirability of affording opportunities to the Licentiates for obtaining the M. B., B. S. degree. This Council should be given an opportunity to submit its proposal on this point before their arriving at a final decision.

13. By a special request, the application for registration of Dr. Mathura Prasad Misra, M.C.P.S., was considered and it was resolved that, since Dr. Misra was in the actual practice of this profession at Muttra on 19th July, 1917, and had submitted a proper certificate to this effect, the Council take the view that he appears to be eligible for registration. His case may be referred to the Standing Committee for report and finally decided by this Council at the next meeting. Meanwhile the Superintendent, S. S. Railway, New Delhi, may be informed that Dr. Mathura Prasad Misra appears to be eligible for registration.

Minutes of the meeting of the United Provinces Medical Council held in the committee room of the office of the Inspector General of Civil Hospital, United Provinces, Lucknow, on 17th November, 1939.

1. The minutes of the last meeting of the United Provinces Medical Council held on 31st March 1939, were read and confirmed subject to the addition of the words "during the interval" at the end of resolution No. 9 thereof.

2. Government notification nominating Lieut.-Col. T. C. Boyd, F.R.C.S.E., M.R.C.P., D.P.H., I.M.S., as President of the United Provinces Medical Council, and the Medical Council notifications notifying the election of Dr. Mohan Lal Agarwal and the re-elections of Rai Bahadur Dr. D. D. Pandya, D.P.H. (C.M.B.), and Captain K. P. Bagchi, M.B., B.S., I.M.S. (Retd.), were read and recorded.

3. General Medical Council's letter informing why post-graduate qualifications like D.O.M.S., D.L.O., etc. are not registered by that Council was read and recorded.

4. The statement of income and expenditure for the year 1938-39 was read and noted.

5. The budget estimates of the United Provinces Medical Council for the year 1940-41 were considered and passed.

6. The audit and inspection note on the accounts of the United Provinces Medical Council for the year 1938-39, with the Registrar's notes of explanations, were considered and the Registrar's explanations were accepted.

7. Delhi Medical Association's resolution, dated the 11th March, 1939, regarding immigration of foreign medical practitioners into this country, was considered and the Council passed the following resolution:

"The United Provinces Medical Council strongly protests against the immigration into this province of foreign medical practitioners, not registrable anywhere in the Empire—much less in these Provinces, also against the fact that no bar has so far been placed against their practising medicine and surgery.

This Council unanimously recommends to the Government to take early steps in the shape of adequate legislation to (i) prevent unrestricted immigration of such practitioners for the purpose of practice into this province, and (ii) to prevent them from practising in the United Provinces since they are neither registered nor possess any registrable qualification.

In this connection, the Council brings to the notice of the Government the fact that Indian Nationals are not allowed to practise in their countries of origin even if they have qualified as doctors in those very countries.

Further, this Council views with great disfavour the association or covering of unregistered foreign medical practitioners by the medical practitioners registered under the United Provinces Medical Act.

8. Health Department, G. G. O. to the Medical Council of India, stating that Provincial Governments were competent to undertake legislation prohibiting practitioners from French India, who were not on the provincial registers, from practising in their provinces was read and recorded.

9. The refusals of other newspapers to publish our election notifications free of charge were read and it was decided that the old practice be reverted to and the clauses in rules 2, 7 (2), 7(4) and 13 of the rules for subsequent elections, requiring their publication in the newspapers, be deleted.

10. The question (i) whether any declaration be asked for from the applicants for restoration and (ii) the question of restoration to the medical register of the name of Dr. Bansi Dhar Tiwari, L.M.P., Registered No. 1477, were considered, and it was resolved that (i) a declaration as demanded under the Bengal Medical

Registration Act may be asked for, and that before a name is erased under section 17(2) a notice should be sent under registered cover, acknowledgment due, and (ii) that the name of Dr. Tiwari be restored.

11. The proposal that in future the number of votes secured by each contestant at an election be notified was considered and it was resolved that the present practice may continue, but the contestants and the members of the Council may be informed upon request.

12. In view of the influx of many men who practise medicine and surgery and about whose qualifications nothing is known, the question as to what constitutes an unqualified person was considered.

Covered by resolution No. 7, *supra*.

13. Resolution No. 3, dated the 24th September, 1939, passed by the United Provinces Branch of the Indian Medical Association, requesting this Council to launch a test prosecution against a quack describing himself as a doctor, was considered and it was decided that the members should report a strong case for a test prosecution.

14. Resolved that this Council recommends to Government to take steps to establish a School of Dentistry as early as possible and to introduce a Dentists' Registration Act. In this connection a reference is invited to the scheme prepared and submitted to Government by the King George's Medical College, which is already under consideration.

15. The members of the Standing Committee, for the year 1940 were appointed.

16. The report of the Standing Committee, which met on 16th November, 1939, was considered and their recommendations were accepted. With regard to item 3 of the report, which the Committee had left for decision of the Council itself, it was resolved that the Council considered the acceptance of directorship unobjectionable and that the rule (code of ethics) be modified in the light of the foregoing decision at the next meeting of the Standing Committee.

17. State Medical Faculty resolution No. 15 of July, 1939, relating to increments in the pay of the inferior servants, was read and agreed to.

18. The question of restoration of the name of Dr. Kanhaiya Lal, L.M.P. (Reg. No. 2957) was considered and it was resolved that his name be restored free of charge and without any affidavit.

19. The question of restoration of the name of Dr. Ram Saran Das Bejal, L.M.P. (Reg. No. 729) was considered and it was resolved that his name be restored provided he submitted an affidavit to the effect that he was the person who was originally registered under certificate No. 729, but no affidavit to the effect that to his knowledge no proceedings for removal of his name were ever taken against him be obtained. It was further resolved that this practice be followed in similar cases in future.

20. Dr. Kunj Behari Lal Varma, L.M.P., seconded by Rai Sahib Dr. Ram Narain Lal, L.M.P. proposed:—

"The United Provinces Medical Council requests the Government to give this Council an opportunity of considering the scheme of reorganization of Agra Medical School before it is finally adopted."

Dr. Vyas seconded by Captain Shivapuri moved:—

"The Council brings to the notice of the Government that they have sanctioned the scheme of reorganization of the Agra Medical School without obtaining the opinion of this Council which is primarily concerned in medical education. It further requests the Government to consult this Council before considering any reorganization of medical education in the province."

The proposal Dr. Vyas having been accepted by the mover was carried.

Punjab Medical Council

Extracts of proceedings of a meeting held on 29-3-40

Considered the following items arising out of the proceedings of the last meeting:—

(i) Report of the Sub-Committee appointed to consider Punjab Government letter No. 2684-M-39/24119, dated the 19th July, 1939, re. reduction in the registration fee.

Resolved—

(a) That the grade of the pay of the Registrar be revised to Rs. 150-10-200, from 1st April, 1940.

(b) That the price of the next Annual Medical List be raised to Rs. 5 per copy.

(c) That the price of the rules and regulations be raised to Re. 0-8-0 per copy and that in future it should not be supplied free of charges to registered medical practitioners on registration.

(d) That a Sub-Committee consisting of the following members be appointed for acquisition or construction of an office building for the combined office of the Punjab Medical Council and the Punjab State Medical Faculty at an early date and that a sum not exceeding Rs. 15,000 be set apart from the funds of the Council (i.e., about Rs. 5,000 on the purchase of a land and about Rs. 10,000 for constructing the building) and that the Punjab State Medical Faculty be requested to sanction a similar sum on similar conditions and appoint their representatives on this Sub-Committee:—

(1) President.

(2) K. B. Dr. Hir Hidayat Ullah.

(3) Dr. B. J. Sahni.

(c) The Government be requested to reduce the registration fee at an early date.

(ii) Rules for the L.M.S. of the Punjab State Medical Faculty.

Resolved that a Sub-Committee consisting of the following members be appointed to submit their report on the rules for the L.M.S., of the Punjab State Medical Faculty:—

(1) President.

(2) Dr. Vishwa Nath.

(3) Dr. B. J. Sahni.

(4) Lt.-Col. V. R. Mirajkar, I.M.S.

(iii) Applications of Dr. Mrs. Selzer and Dr. Mrs. Kalish for registration in the Punjab Medical Register. (Dr. Mrs. Selzer and Dr. Mrs. Kalish produced their original certificates before the Council).

Resolved that the consideration of the applications of Dr. Mrs. Kalish and Dr. Mrs. Selzer be postponed and a reference be made to the Dean of the University of Rome and the Registrar of the General Medical Council as to whether the holders of the M.D. (U. Rome) qualifications are entitled to practise Medicine in Italy and the Dean of the University of Rome be further requested about the curriculum and courses undergone and the examinations passed by Dr. Mrs. Selzer and Dr. Mrs. Kalish before obtaining their qualifications.

Resolved that the Examiners are advised in their own interest to refrain from criticising the personnel of the Inspectors duly appointed by the Council in their official communications and records that in future such behaviour on their part will be looked upon by the Council with displeasure and that the Registrar be instructed to obtain from the various Provincial Medical Councils in India and also from the Secretary, Medical Council of India their forms

for the visitation of examinations and place them before the next meeting of the Executive Committee for drafting the rules and instrument of instructions for the visitation of Examinations by the Punjab Medical Council.

The following resolution was considered by the Council:—

"Resolved that members of the Council in the employ of Government be not paid any fee for attending the meetings of the Council or its Sub-Committees."

After discussion the resolution was put to vote with the following result:—

In favour	...	...	6
Against	...	...	7
Neutral	...	...	3

The resolution was, therefore, declared defeated.

Considered, letter No. 5161-M-39, dated the 4th January, 1940, regarding the inspection of Medical Schools and to appoint members for the inspection of Schools.

The following names were proposed in addition to that of the President,

(1) Dr. Vishwa Nath. (2) Lt.-Col. V. R. Mirajkar, I.M.S. A ballot was taken with the following result:—

In favour of Dr. Vishwa Nath	...	8
In favour of Lt.-Col. V. R. Mirajkar	...	8

With the casting vote of the President Dr. Vishwa Nath was elected in addition to the President to inspect the Medical Schools.

Considered the recommendations of the Registration Sub-Committee held on the 16th March, 1940.

Resolved that the recommendations of the Registration Sub-Committee (Appendix) held on the 16th March, 1940, be approved.

Considered the recommendations of the Sub-Committee appointed to select a Registrar and Secretary.

The President drew the attention of the members that plenary powers having been given by the Council to the Sub-Committee regarding the selection of Registrar and Secretary only their recommendation regarding the appointment of a Head Clerk was required to be considered by the Council to which Captain Ram Chand Goulatia raised an objection and said that the Council alone was competent to appoint a Registrar. The Council agreed to the decision of the Sub-Committee regarding the appointment of the Registrar being considered.

Only two voted in favour of the proposal, that the recommendations of this Sub-Committee be sent back to the same Sub-Committee with a request to recommend the name of a medical man for the post of Registrar.

The proposal that the recommendations of the Sub-Committee regarding the appointment of Pandit Hans Raj as Registrar be accepted was carried. 10 voting for the proposal, 2 against and 4 abstained from voting.

(iv) Appointment of a Head Clerk. It was brought to the notice of the Council their resolution regarding the pay of the new entrants and suggested that the claims of the present clerk who was drawing Rs. 90 be considered.

After considering the claims of the present clerk it was resolved that he be appointed as Head Clerk in the grade of Rs. 80—2—90 on probation for one year.

Resolved that the members of the Council be allowed with the permission of the President to inspect documents of the Council and that rules in this respect be drafted by the next meeting of the Executive Committee.

The President brought to the notice of the Council that as he was not sure from the resolution of the Council regarding allowing of visitors to attend a special meeting of the Council he desires the opinion of the Council in the matter, and it was resolved that visitors can attend any meetings of the Council with the permission of the President.

Extracts of proceedings of a meeting of the Registration Sub-Committee held on 16th March 1940.

1. Considered the application of Dr. Charan Singh Sandhu, M.D. (Kansas) for registration in the Punjab Medical Register.

Recommended that the name of Dr. Charan Singh Sandu, M. D. (Kansas) be recommended to Government for registration in the Punjab Medical Register.

2. Considered the application of Dr. Mrs. D. D. Chacko, M.D. (Columbia University) D.N.B., (Diplomate of the National Board of Medical Examiners, (U.S.A.) D.T.M. & H., (London School of Tropical Medicine and Hygiene) for registration in the Punjab Medical Register.

Recommended that the name of Dr. Mrs. D. D. Chacko, be recommended to Government for registration in the Punjab Medical Register.

3. Considered the application of Dr. Mrs. Khaliq, M.D. (Hungary) for registration in the Punjab Medical Register.

Recommended that the consideration of her application be postponed pending full details of her qualifications.

4. Considered the application of Dr. S. C. Ghose, L.C.P.S., (Calcutta) for registration in the Punjab Medical Register.

Recommended that the names of Dr. S. C. Ghose be not registered in the Punjab Medical Register.

5. Considered the application of Dr. H. Ziegler, M.D. (Berlin) for registration in the Punjab Medical Register.

Recommended that the names of Dr. H. Ziegler, M.D. (Berlin) be not registered in the Punjab Medical Register.

6. Considered the application of Dr. I. Unger, M.D. (Vienna) for registration in the Punjab Medical Register.

Recommended that the name of Dr. I. Unger, M.D. (Vienna) be not registered in the Punjab Medical Register.

7. Considered the application for registration of Mr. Dina Nath, Maniktala who passed the M. B., B. S. Examination of the Punjab University but was not admitted to the degree.

Recommended that the complaint received against him from the Medical Superintendent, Mayo Hospital, Lahore, be forwarded to the Inspector-General of Police Punjab, Lahore, for taking necessary action against him.

8. Considered the explanations of the following registered medical practitioners for the grant of a testimonial to the Greenland Company:—

- (1) Dr. Nur Ahmad Qureshi, P.S.M.S.
- (2) Dr. W. K. Coombes, I.M.D.
- (3) K. S. Dr. Ghulam Mohammad, P. C. M. S.

Recommended—

(i) that their explanations be accepted and that Dr. Nur Ahmad Qureshi, P.C.M.S., and Dr. W.K. Coombes be asked to write to the Manager, Greenland Company to stop the publication of their certificates forthwith.

(ii) that the Inspector-General of Civil Hospitals, Punjab, be requested to issue a circular to all Medical Officers serving under him asking them to refrain from granting testimonials to manufacturing concerns.

9. Considered the explanation of Dr. Moti Singh, L.S.M.F., for an advertisement issued in his favour.

Recommended that he be warned to be careful in future and that the person who issued the advertisement be asked to let this office know if the advertisement was issued by him without the knowledge of Dr. Moti Singh.

10. Considered the explanation of Dr. Radha Krishen M.B., B.S., for an advertisement issued in his favour.

Recommended that Doctor Radha Krishen, M.B., B.S., be asked to be more careful in future and that the person who issued the advertisement be asked to let this office know if the advertisement was issued by him without the knowledge of Dr. Radha Krishen.

11. Considered the explanation of Captain S. L. Narula, M. B., B. S., regarding the publication of his photo and testimonial granted to Modi Vanaspati Manufacturing Company.

Recommended that Captain S. L. Narula, M.B., B.S., be warned to be more careful in future.

12. Considered the explanation of Dr. Som Datt Vaid, L.C.P.S., regarding an advertisement published by him.

Recommended that his attention be invited to resolution passed by the Punjab Medical Council at their meeting held on the 9th of April, 1932, and he be asked to give his further explanation as his present explanation is not satisfactory.

13. Considered the explanation of Dr. Puran Chand, M.B., B.S., regarding an alleged false medical certificate.

Recommended that no action is called for against Dr. Puran Chand, M.B., B.S.

14. Considered letter, dated 21st January, 1940 from Captain C. L. Malhotra, regarding the addition of the letters "F. A. I. O. H." by Dr. J. N. Luthra after his name.

Recommended that no action is needed in the matter.

15. Recommended that the following be registered as additional qualifications in the Punjab Medical Register:—

D. O. (Diploma in Ophthalmology—granted by the Punjab State Medical Faculty).

T. D. D. (Tuberculosis Diseases Diploma—granted by the University of Wales).

16. Considered the requests of the following registered medical practitioners for the alteration in their names:—

Dr. Kamala J. Jones.	} On account of marriage.
Dr. I. Vincent.	
Dr. Lila Tawedey.	
Dr. Rose C. Drummond.	
Dr. Mahawa Ram Sud.	

Recommended that their requests be accepted.

17. Considered the explanation of Dr. Narain Singh Mehta, L. M. S., for sending his visiting cards to the persons residing at Ferozepore Road, Lahore.

Recommended that his explanation be accepted.

18. Considered letter No. 3239-G., dated the 14th December, 1939, from the Superintendent, Government Printing, Punjab, regarding a certificate issued by Dr. Mohammad Raza Mirza, M.B., B.S.

Recommended that no action is called for against Dr. Mohammad Miraz, M.B., B.S.

Poison Rules in U. P.

[We are enabled to publish the following consolidated amendments to U. P. Poison rules through the courtesy Dr. K. B. L. Varma, Prov. Secy., U. P. Branch of the A. I. M. L. A. Ed. I. M. J.]

Amended rules under Section 2 of the Poisons' Act in force since 15th April 1935. (Vide G.O. No. 1273-VI-1776 of 29th September 1933 and G. O. 1000-VI-1776 dated 15th April 1935).—The following amended rules under the Poisons' Act were framed by the U. P. Government in the exercise of powers conferred by the section 2 of the Poisons' Act XII of 1919 and published and notified in the U. P. Government Gazette vide their Judicial (Criminal) department No. 1273-VI-1776-1930 of 29th September 1933 and No. 1000-VI-1776-1930 dated 15th April 1935.

These amended rules are amendments to the rules Nos. 3, 4 and 9 and schedule to the rules published with their notification No. 631-VI-1149 dated 15th February 1921.

G.O. 631-VI-1149 dated 15th February 1921.—Rule 3.—No person not exempted under the provisions of the Act shall sell or possess for sale any poison specified in the schedule except under a licence granted in that behalf by the District Magistrate.

Amendment No. 1 Vide G.O. No. 1273-VI-1776 dated 29th September 1933 (The following note shall be added to rule 3). Note.—1. A medical practitioner registered under the United Provinces Medical Act, 1917 with the U. P. Medical Council, who directly supplies his own patients with medicines at his own dispensary wherein his own prescriptions only and not those of any other Medical Practitioner are dispensed shall be deemed to be exempt under the provisions of Sub-Section (1) of Section 9 of the Act and shall not be required to take out a licence under these rules.

Amendment 1 (a) Vide G.O. No. 1000-VI-1776 dated 15th April 1935—(In Rule 3 for the four provisos to note 1, substitute the following).—Provided that the medical practitioner keeps in book form a register of his purchases of the poisons enumerated in the schedule, one column being used for each poison and the balance in hand in each case being entered on the last day of each month.

Amendment 1 (b) Vide G. O. No. 1000-VI-1776 dated 15th April 1935—(For note 2 to Rule 3 substitute the following). Note 2.—A practitioner, who is not registered under the United Provincial Medical Act, 1917, and who maintains a dispensary wherein either his own prescriptions to his patients or the prescriptions of other medical practitioners are dispensed, shall be deemed to sell the medicines to his clients and such medicines shall not contain any of the poisons enumerated in the schedule unless the medical practitioner holds a licence for their sale. A practitioner registered under the United Provinces Medical Act, 1917, who maintains such a dispensary will be required to register his name with the district magistrate and maintain a full record of all sales to other than his own patients; he will also file all prescriptions or vouchers in support of such sales for a period of twelve months.

G.O. 631-VI-1149 dated 16th February 1921.—Rule 4.—The grant or withdrawal of a licence to any applicant shall be at the discretion of the District Magistrate, whose decision thereon shall be final.

Amendment No. (2) vide G.O. No. 1273-VI-1776 of 29th September 1933—(The following sentence shall be added at the end of Rule 4).—Medical practitioners not possessing registrable qualifications should not be granted licence for the sale of any of the poisons mentioned in item No. 6 of the Schedule.

G.O. No. 631-VI-1149 dated 15th February 1921.—Rule 9.—A licence-holder shall not sell any poison to any person unless the latter is personally known to him or identified to his satisfaction. He shall not sell any poison to any person who appears to him to be under the age of 18 or to any person who does not appear to him to be in full possession of his faculties or to any wandering mendicant.

Amendment No. (3) vide G.O. No. 273-VI-1776 dated 29th September 1933—(The following sentence shall be added at

the end of Rule 9).—He shall not sell or dispense the poisonous preparations of the British Pharmacopoeia enumerated in item No. 6 of the Schedule except on a prescription given by medical practitioner possessing qualifications registrable under the United Provinces Act, 1917.

Amendment No. (4) vide G.O. No. 1273-VI-1776 dated 29th September 1933—(The following shall be added as a new item No. 6 in the Schedule to the rules) (5).—Poisonous preparations of the British Pharmacopoeia.

Amendment No. (2) vide G.O. 1000-VI dated 15th April 1935. For the list of poisonous preparations of the British Pharmacopoeia given in item No. 6 of the Schedule, omit 1, 2, 4 to 9, 15, 20 and 27 to 29 and renumber the rest).—Amended and renumbered list:—

1. Atropine—its salts and British Pharmacopoeia preparations.
2. Chloroform and preparations containing more than 20 per cent of Chloroform.
3. Cocaine, its salts and British Pharmacopoeia preparations.
4. British Pharmacopoeia preparations of *Dhatura*.
5. Diethyl-Barbituric acid and such derivatives as Veronal Propional Medinal.
6. *Digitalis* and its British Pharmacopoeia preparations.
7. Homatropine Hydrobromide and its preparations.
8. *Hyoscyne Hydrobromide*.
9. *Hyoscyamine Sulphate*.
10. All British Pharmacopoeia preparations of *Nucis vomica* containing more than 2 per cent strychnine—and all its alkaloids with their salts and preparations.
11. *Oxalic acid*.
12. *Phosphorus* and all preparations containing '305 or more per cent of free phosphorus.
13. *Physostigmine sulphate*.
14. *Pilocarpine nitras*.
15. *Prussic Acid* and all preparations containing more than 1 per cent of it.
16. *Sulphonal* and its Homologues such as *Trional*, *Tetronal*.
17. Tartar Emetic and its British Pharmacopoeia preparations containing more than one per cent of it, also its derivatives and organic compounds.

Note.—“Preparations” or “British Pharmacopoeia preparations” in this list refer to preparations official in the British Pharmacopoeia 1932 edition except item No. 4 (preparations of Dhatura included only in the schedule of poisonous preparation of the 1914 edition of the British Pharmacopoeia).

Government Judicial (Criminal) Department. Miscellaneous Notification No. 1562-VI-1776-1930 dated September 3, 1936. No. 1562-VI-1776-1930.—The Governor in Council is pleased to cancel the following notifications issued under section 2 of the Poison Act, 1919 (XII of 1919), to the extent shown against each.

1. No. 1237-VI-1776-1930 dated the 29th September 1933.—Item (1) Under “Amendments”.
2. No. 1000-VI-1776-1930, dated the 15th April 1935.—Item 1 (a) and (b) Under “Amendments”.

The following Press Communiqué was issued from Nainital, as published in the National Call, Aug. 19, 1936.

REGULATING USE OF POISONS BY MEDICAL PRACTITIONERS

It is notified for general information that the rules framed by the Local Government in certain notifications issued since 1934 to regulate the dealings of Medical practitioners in British Pharmacopoeia poisons have been rescinded to the extent that they apply to qualified medical practitioners whether registered or not. A conference which considered these rules at Nainital recently advised Government that the rules except in their application to practitioners without registrable qualifications should be cancelled and Government have decided to accept the recommendation.

The conference recommended further that the question of issuing fresh rules upon the subject in strict accordance with the rules which apply to medical practitioners in Great Britain should be taken up. Government have accepted this recommendation also and the question will be referred shortly to the Medical Council for their opinion and advice.

SERVICE NOTES

- U. P. (P. S. M. S.) April-1940
- Dr. Narayan Sharma, Reserve duty, Mainpuri, to J. and P. Hospitals, Mainpuri.
- .. Hawi Shankar, granted leave.
- .. Rasik Behari Lal, Sadar Hospital, Bara Banki to Daryabad, Bara Banki.
- .. Damodar Singh, Daryabad, Bara Banki to Reserve duty, Bara Banki.
- .. Narayan Sharma, Shikohabad, Mainpuri to Reserve duty, Mainpuri.
- .. Bhagwati Sahai, Sadar Hospital, Etawah, to Bharthane, Etawah.
- .. Zainul Abdeen, (Tempy. P. S. M. S.), Bharthana, Etawah, to Reserve duty, Etawah.
- .. Bindeshwari Singh, Dist. Jail Ghazipur, to Reserve duty, Ghazipur.
- .. S. M. Patankar, from leave to Dist. Jail, Ghazipur.
- .. S. K. Dwivedi, J. and P. Agra, to Reserve duty, Cawnpore.
- .. M. B. Nigam, from leave to J. and P., Cawnpore.
- .. A. B. Endlaw, Mental Hospital, Agra, to Reserve duty, Naini Tal.
- .. S. S. Pandey, Utraula, Gonda to leave.
- .. P. C. Sharma, Reserve duty, Bulandshahar, to Utraula, Gonda.
- .. Gopal Krishna Jhingran (Tempy. P. S. M. S) Mental Hospital, Agra to Reserve duty, Agra.
- .. Ishwari Prasad, Tajganj, Agra to leave (pr.)
- .. S. Allauddin, Police Hospital, Agra to Tajganj, Agra.
- .. Shiv Lal, Reserve duty, Meerut, to Reserve duty, Agra.
- .. do do. Agra to Police Hospital, Agra.
- .. Hazura Singh, Reserve duty, Lucknow to Gangoh, Saharanpur.
- Bengal (P. S. M. S.)-15-3-40 to 14-4-40
- Dr. Mohini Mohan Goswami, Supy. duty, S. N. P. Hospital, Bhowanipur to Eastern Frontier Rifle Hospital, Dum Dum.
- .. Mohini Mohan Roy Choudhury, Eastern Frontier Rifles Hospital, Dum Dum, to Supy. S. N. P. Hospital, Bhowanipur.
- .. Suresh Chandra Choudhury, 2nd S. A. S. Central Jail, Alipore, to 1st S. A. S., Central Jail, Alipore.
- .. Saroj Bandhab Ghosh, Supy. duty, Sadar Hospital, Chittagong, to 2nd S. A. S. Central Jail, Alipore.
- .. Haran Chandra Sen, from leave to Supy. Mitford Hospital, Dacca.
- .. Jamini Kumar Mukherjee, granted leave from 3-1-40 to 16-3-40.
- ombay (S. M. S)-16-3-40 to 15-4-40
- Dr. S. R. Ambike, Ahmednagar to Ratnagiri.
- .. P. M. Talati, Jhalod to Kapadvanj.
- .. S. H. Prabhu, G. T. Hosp., Bombay to Civil Hospital, Thana.
- .. D. N. Joshi, Sangamner to Rahuri, Ahmednagar.
- .. M. D. Bokil, Ratnagiri to Nasik.

- Dr. Fakirullah Fathedin, 2nd Asstt. Civil Hospital, Nasik to General Duty of the same Hospital.
- .. B. S. Neurgaonkar, Nasik to Akalkuwa, W. Khandesh.
- .. S. P. Desai, Ratnagiri to Poona.
- .. B. S. Tote, Akalkuwa to leave for 45 days.
- .. P. S. Babre, St. George's Hospital, Bombay, to G.T. Hospital, Bombay.
- .. Mrs. K. P. Makasari, Nasik, leave for 1 month.
- .. B. R. Sathe, Ahmednagar, to Alibag.
- .. R. D. D'Souza, Alibag, granted leave for 15 days.
- .. A. H. Taqui, Edlabad, E. Khandesh to Junnar, E. Khandash.
- .. V. V. Mahajani, Wai, Dist. Satara to Sholapur.
- .. K. S. Avachat, Junnar to Wai, Dist. Satara.
- .. V. S. Kelkar, Sholapur to Edlabad, E. Khandesh.
- .. P. S. Babre, G. T. Hospital, Bombay, to H. M.'s House of Correction, Bombay.
- .. P. M. Talati, Kapadvanj to Modasa, Ahmedabad.
- .. V. C. Parikh, Mandal, Ahmedabad, to Civil Hospital, Ahmedabad.
- .. J. M. Bhagat, Dholera, to Ahmedabad, Civil Hospital, Ahmedabad.
- .. P. R. Gunaji, Agricultural College Dispy., Poona to Sassoon Hospital, Poona.
- .. P. M. Joshi, from leave to Ankleshwar.
- Khan Sahib Dr. A. D. Patel, Ankleshwar to Bai Motlibai and Petit Hospitals, Bombay.

- The following candidates have been taken up in the S.M.S.
- Dr. M. A. Patel, General duty, Civil Hospital, Ahmedabad.
- .. Y. T. Bhalerao, General Duty, Civil Hospital, Broach.
- .. S. S. Ranade, General duty, Civil Hospital, Belgaum.
- .. G. V. Kulkarni, 2nd Asstt. Mental Hospital, Dharwar.
- .. B. S. Vaze, General duty, Civil Hospital, Kaira.
- The following S. M. S. Officers have expired during February and March 1940.
- Dr. B. M. Kasture, died on 5-2-40.
- .. W. H. Rahalkar died on 14-2-40.
- .. M. P. Tripathi died on 29-3-40.

Thirtieth Conference of the All-India Medical Licentiates' Association meets at Ahmedabad during Christmas Week, 1940.

- Meet your Colleagues there and solve your problems by consultation.
- Equip yourself with renewed strength to serve your country and your profession.
- The Association would indicate your rights and obligations. Cherish them with faith, and act your part without fear.

ASSOCIATION NOTES

[The proceedings printed below refer to the Branches and Committees of the A. I. M. L. A unless otherwise stated.]

Nadia (Bengal). Meeting held on 3-3-1940. 11 members were present.

The welcome address of the chairman, R. C. and agenda of the Conference were read and discussed.

Minutes of the last meeting discussed and confirmed.

Branch accounts for the month of February 1940 were examined and passed.

Burdwan (Bengal). Meeting held on 8-3-40. 5 doctors were present.

Unanimously resolved that Drs. Ahi Bhusan Mukherjee, Satya Charan Maitra, Gunananda Mukherjee, Atul Pati Banerjee, B. Basu and Baidya Nath Sen Gupta be elected as delegates to the ensuing Provincial Conference to be held at Krishnagar (Nadia) on the 24th and 25th Mar. '40.

Unanimously resolved that Rs. 5 only be sanctioned as contribution of this branch to the ensuing Provincial Conference.

Unanimously resolved that the contingent bill amounting to Rs. 1-10-3 only for the months from October 1939 to February 1940 be passed.

Chittagong (Bengal). Annual General meeting held on 4-3-40 with Dr. J. C. Mitter in the chair. 20 members were present.

Proceedings of the last meeting read and confirmed.

Accounts of the last year audited and passed.

Resignation letter of Secretary, Dr. S. B. Ghose, which was kept in abeyance till 14-12-39 was accepted and Dr. A. Quasim was elected to act in his place.

Office-bearers for 1940:—Drs. J. C. Mitter—President, Drs. D. C. Das Gupta and D. B. Das—Vice-Presidents, Dr. A. Quasim—Secretary and Treasurer, Dr. A. L. Chowdhury—Joint Secretary, Dr. J. C. Chakravarty—Auditor.

Members of the Executive Committee:—Drs. J. P. Biswas, D. M. Chanda, M. Barua, Miss A. Paul, S. L. Khastagir with powers to co-opt.

Resolved that Dr. A. Quasim be elected as Treasurer of the Branch.

Recorded the meritorious services of the out-going Secretary, Dr. S. B. Ghose.

Resolved to issue appeals to all the doctors for donating to the Bengal Provincial Conference.

Resolved to inform the District Magistrate, Chittagong, the Association's willingness to help the Sitakunda Mela with medical unit.

Resolved to nominate Dr. Ahi Bhusan Mukherjee for the presidency of the Bengal Provincial Conference.

Resolved to appoint a peon for the office of the Secretary.

24 Parganas (Bengal). Monthly meeting held on 5-3-40. 10 doctors were present.

The death of Dr. Nilmony Das, Barnagore, was condoled.

Proceedings of the last meeting read and confirmed.

Appealed to members to work for increasing the membership of the Association.

Resolutions for the coming Bengal Provincial Conference were discussed.

Mymensingh (Bengal). Annual General meeting held on 15-3-40. 24 members were present.

Branch annual report was read.

Office bearers for 1940-41: Drs. H. Bagchi—President, M. N. Ray—Vice-President, B. Chaudhuri—Secretary, S. Bagchi—Joint Secretary, M. C. Aich—Auditor.

Members of the Executive Committee: Drs. H. Bagchi, M. N. Ray, B. Chaudhuri, S. Bagchi, T. N. Bhattacharjee, M. C. Aich, M. Rahman, S. Bhowmik, J. K. Chakravarty.

Interesting paper on "Foreign bodies in the eye" was read by Dr. A. Talukdar.

A lecture on the "Application of radiology in general practice" was given by Dr. T. N. Bhattacharjee.

Annual Report.—During the year, the membership increased from 40 to 61, owing to the help of all members,

Drs. T. N. Bhattacharjee and J. K. Chakravarty represented this Branch during the last Prov. Conference. This Branch felt glad at the successful election of Dr. T. N. Bhattacharjee as a member of the Bengal Council of Medical Registration and complimented him for his help to the Branch. Lastly, the Secretary appealed for the co-operation of all members to help the Association in all ways.

Dibrugarh (Assam). Annual General meeting held on 3-3-40. 9 doctors were present. Dr. M. Barooa was in the chair.

Minutes of the last meeting were read and confirmed.

Accounts from 1-9-39 to 29-2-40 were checked and passed.

Circular No. 3 of G. S. was read and members were requested to send notices of any change in the constitution to be considered at the next meeting.

Annual report was read and adopted.

Office bearers: Dr. P. K. Bose—President, Dr. B. K. Das Gupta—Vice-President, Dr. S. P. Nath—Secretary and Treasurer, Dr. S. R. Das—Auditor. *Standing Committee Members:* Drs. M. Barooa, K. L. Ghosh, Md. K. Rahman, Miss P. Sahu, A. C. Das. The Committee appreciated the services of the out-going office-bearers.

Drs. S. P. Nath and K. L. Ghosh were re-elected as members of the Provincial Standing Committee from this Branch.

Resolved that the Provincial Secretary be requested to invite the kind attention of the Secretary, Assam Branch of the Indian Tea Association to the fact that unregistered doctors are still being employed in tea garden hospitals although there is no dearth of duly qualified and registered doctors.

Further resolved that the Provincial Secretary be requested to ask for and to obtain a copy of the registered and unregistered A. M. Os. in tea garden service from the Tea Association collected by them in the year 1939 and that he be requested to forward a copy to this Branch.

Annual Report. Last annual meeting was held on 18-9-1938. There were 13 meetings:—1 special and 1 standing committee. Scientific papers were read and discussed.

During the period under review, a memorial was sent to the Government protesting against the policy of replacing the S. A. Ss. by the Local Board doctors. Assam Medical College Education Committee was formed in a special meeting. A deputation waited on the Hon'ble Premier and the Health Minister and discussed with them about the raising of the status of the B. W. Medical School, replacement of S. A. Ss. by L. B. doctors, independent charge of sub-divisional hospitals and the house rent allowance of P. H. doctors. Assam Medical College Day was observed. Report of the Medical College Education Committee was prepared by 2 members of this Branch. Protested against the unjustifiable remarks Dr. Cursetji about the medical licentiates as published in the *Insurance World*. Anti-Indian Medical Council Act Day was observed.

Propaganda work was carried on by correspondence. There were 40 members, including 14 student members on the roll.

Tinsukia (Assam). Ordinary meeting held on 25-2-40. 7 doctors were present. Dr. K. M. Ganguli was in the chair.

Minutes of the last meeting were read and confirmed.

Read G. S. Circular No. 3 of 5-2-40, and G. S.'s letters: re-Gauhati Conference resolution No. 16 of Assam Tea garden medical service; Read also Jorhat Branch proceedings regarding the new scheme of tea garden medical services; Provincial Secretary's appeal regarding medical education in Assam.

4 new members were enlisted to the Branch.

Gauhati (Assam). Meeting held on 4-3-30. Dr. U. M. Lahiri presided.

Minutes of the last meeting read and confirmed.

Appeal from the Secretary, Assam Provincial Branch, was read and resolved to observe Assam Medical College Education Day.

Resolved that the subsidy given to the medical Officers in subsidized dispensaries be raised to Rs. 50 per mensem and further an additional grant for treatment of malaria be made to such dispensaries over and above the usual grant for medicines and equipment, etc.

Tingri Valley (Assam). Scientific meeting held on 25-2-40 with Dr. D. D. Sarma Baruah in the chair.

Minutes of the last meeting read and confirmed.

Scientific papers—"Planning of an ordinary tea estate hospital diet" by Dr. B. N. Chowdhury, "Common defects in the tea garden coolies' diet and suggestions for overcoming them" by Dr. K. C. Bhattacharjee and "Diet as a factor in the treatment of diseases" by Dr. S. C. Dutta were read.

Fyzabad (U. P.) 1. Ordinary meeting held at the residence of Dr. Mrs. R. I. Buck, Lady doctor at Ajodhya. R. S. Dr. Brij Mohan was in the chair. 9 doctors were present.

Minutes of the last meeting read and confirmed.

Accounts upto July 1939 with a balance of Rs. 44-15-6 were passed.

G. S. Circular No. 19 of 21-6-39 read and resolved that an enquiry be made in what form memorial of late R. B. Dr. Sarju Prasad is being proposed to be commemorated.

G. S. Circular No. 20 read and resolved that the General Secretary be informed that efforts are being made to enlist new members.

G. S. Circular No. 21 read and resolved that this District Branch is not in a position to invite A. I. M. I. A. Conference at Fyzabad.

Read Provincial Secretary's letter for holding U. P. S. C. meeting at Fyzabad and was resolved that this Branch cannot invite S. C. meeting at such a short notice.

Resignation letter of Dr. Syed Ahmed: Resolved that as Dr. Syed Ahmed is not a member of the Mother Association he cannot remain a member of this Branch, as pointed out by G. S., and he be informed accordingly.

Resignation letter of Dr. S. L. Basi: the matter was postponed.

Government press report re. introduction of 5 years' course with Inter. Science was read. Resolved that Agra Medical School be affiliated to Agra University by converting the School into a College.

Resolved that Rs. 9/10/0, realised in the month of May 1939 by the absconded peon, may be adjusted towards peon's pay.

2. Ordinary meeting held on 20-9-39. 8 doctors were present. Dr. B. M. Lall was in the chair.

Minutes of the last meeting read and confirmed.

Consideration of Accounts was postponed.

G. S. Circular No. 35 of 17-9-39 along with appeal about "War and our duty" was approved by the members.

G. S. Circular No. 28 of 14-8-39 was read. The meeting condemned the policy of the Government in not amending the Indian Medical Council Act so as to include in its purview the medical licentiates.

G. S. Circular No. 32 was read. This meeting approved the enlistment of new members without admission fees during September 1939.

Provincial Secretary's letter about the epidemic advisory boards, U. P. was read and resolved to send a copy of the same to all the members for opinion.

G. S. Circular No. 31 was read along with his reply to this Branch's resolution on the memorial of late R. B. Dr. Sarju Prasad. Resolved that in the opinion of this Branch the said memorial should take the form of a post-graduate training for medical licentiates. Also approved the suggestion of G. S. about the starting of an Insurance Company by our Association.

Resolved that the I. G. C. H., U. P., be requested through the Provincial Secretary, U. P. to raise the percentage of promotion of P. S. M. S. to P. M. S. from 3 to 10 per cent.

3. Scientific meeting was held on 29-10-39. 15 doctors were present.

Capt. Said Ahmed, F. R. C. S., I. M. S. presided and spoke on the "General Infection".

4. Annual meeting held at the residence of Dr. S. A. Quraishi. R. S. Dr. B. M. Lall was in the chair. 10 doctors were present.

Minutes of the last meeting read and confirmed.

Annual report for 1938-39 was read by the Secretary and approved.

Accounts up to 13-12-39 with a balance of Rs. 29-13-6 was checked and passed.

Provincial Secretary's letter with resolutions marked were read.

The question of inviting the Provincial Conference was discussed.

Bareilly Branch's resolution was considered and decided that there was no use in pressing the resolution.

This meeting strongly protested against resolution No. 8 of Jan. 1935 of Countess Dufferin Fund, U. P. and resolved to make a representation to the Dufferin Hospital authorities.

Provincial Secretary's circular about subscription was read.

Consideration of Dr. Buck's resignation was postponed. But Dr. Basi's resignation was accepted.

Office-bearers: Dr. B. M. Lal (Rai Sahib)—President, Dr. S. A. Qureshi—Vice-President, Dr. I. N. Saxena—Secretary, Dr. Dinesh Verma—Asst. Secretary and Treasurer. Executive Committee: Drs. Mahood Ali, S. L. Dubey, Idocola Singh, Gurdial Singh Lady doctor P. J. Chandy, H. L. Gupta.

Sialkot (Punjab). Meeting held on 25-2-40. Dr. Tala Ram was in the chair. 15 doctors were present.

Chhabil Das gave an account of the Association and licentiates, and requested the non-members to become members of the Association.

Office-bearers: Dr. Chhabil Das—President, Dr. Tala Ram—Senior Vice-President, Dr. Abdul Hamid—Joint Vice-President, Dr. Mulk Raj Jandial—Secretary, Dr. Sultan—Joint Secretary, Dr. Kedar Nath—Treasurer. Executive Committee members: Drs. Kanaya Lall, Behari Lall, Kirpal Singh, Gurdial Singh, Arur Singh, Chaman Lall, Mohd. Abdulla.

It was decided that 5 shall be the quorum of the Executive Committee.

Rohtak (Punjab). Meeting held on 11-2-40 with Dr. Hukam Chand Khosla in the chair. 9 doctors were present. Resolved to recruit more members to the Association.

Resolved that Dr. R. S. S. Khara to act as Treasurer and copy of this be sent to Dr. Handa, the previous Treasurer, to send all accounts and amounts with him to Dr. R. S. S. Khara, M. O. Madina.

It is proposed that the President and the Secretary should approach the Provincial Secretary in connection with certain matters.

Accounts (expenditure) for Rs. 4-8-0 were approved. Resolved that the following doctors should wait upon the Chairman, District Board, Rohtak, in connection with 5 and 10% cut on the medical officers of the rural dispensaries:

Drs. Hukam Chand Khosla, A. R. Luthra, Bishambar Das Malhan, Lekh Singh, Lakhi Ram.

Saran (Bihar). Annual General Meeting held on 2-3-40. 5 doctors were present.

The following office-bearers were elected: Drs. Mrs. K. Banerjee—President, B. Gupta—Secretary.

Madras. Committee meeting held on 31-3-40 with Dr. D. V. Venkappa in the chair. 10 doctors were present. Minutes of the previous meeting read and confirmed.

Accounts for the Mayor Dinner was approved and the deficit of Rs. 7-2-6 to be recovered from the local fund.

Accounts for January, February and March 1940 for Rs. 4-11-0, Rs. 12-2-0 and Rs. 6-10-0 were approved.

Resolved to give a dinner to Drs. G. Subbarayudu, Y. Suryanarayana Rao, and Gopalkrishna Rao on their transfers to mofussil stations from the city of Madras and further requests the Hon. Secretary to make the necessary arrangements for the said function.

Ahmedabad (Bombay). First meeting of the Managing Committee held on 18-1-40 with Dr. J. B. Desai in the chair.

Proceedings of the last meeting read and confirmed. G. S. Circular No. 41 of 30-12-39 was read and resolved to hold the 30th Annual Conference in the X-mas week and that the dates be so fixed as not to coincide with the dates of holding the Indian Medical Association's Annual conference.

Resolved that the Reception Committee members should pay at least Rs. 10/-.

Resolved that the Reception Committee and the Managing Committee for the Conference be elected in the next general meeting to be held on 28-1-40 and collecting donations and scientific papers be started therefrom.



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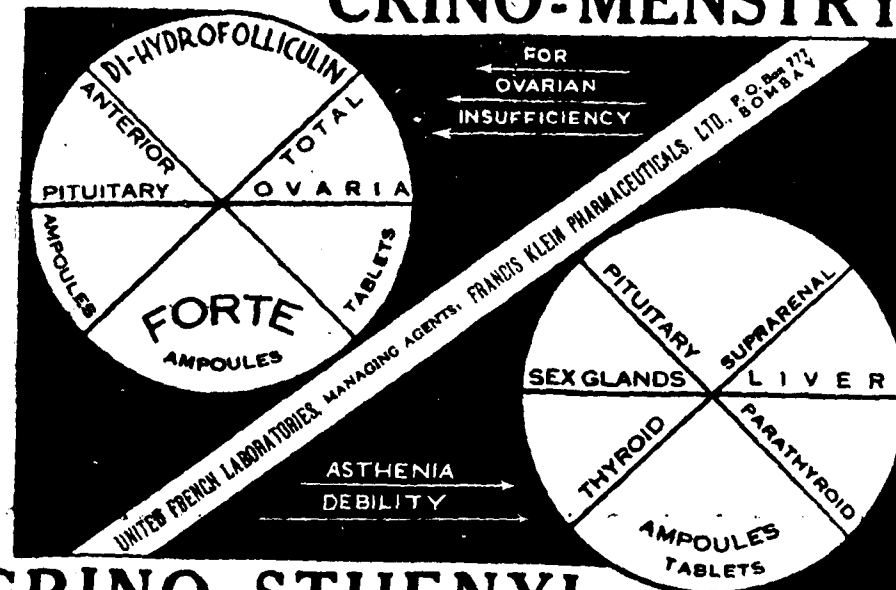
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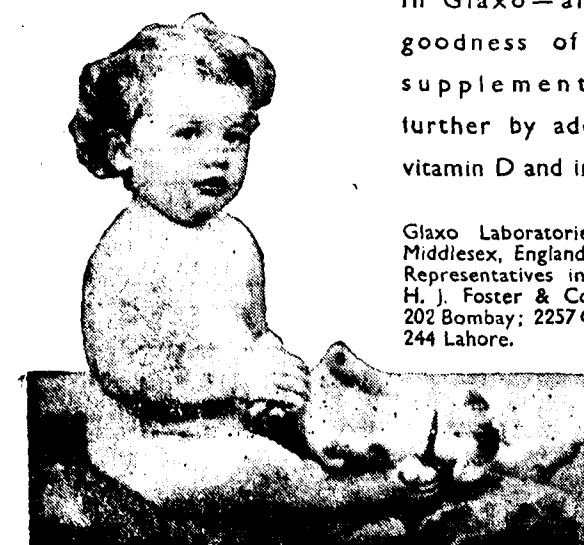
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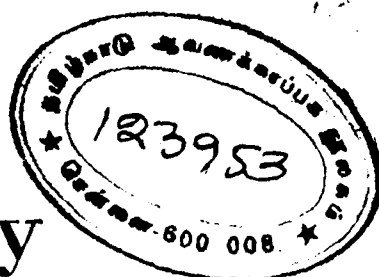
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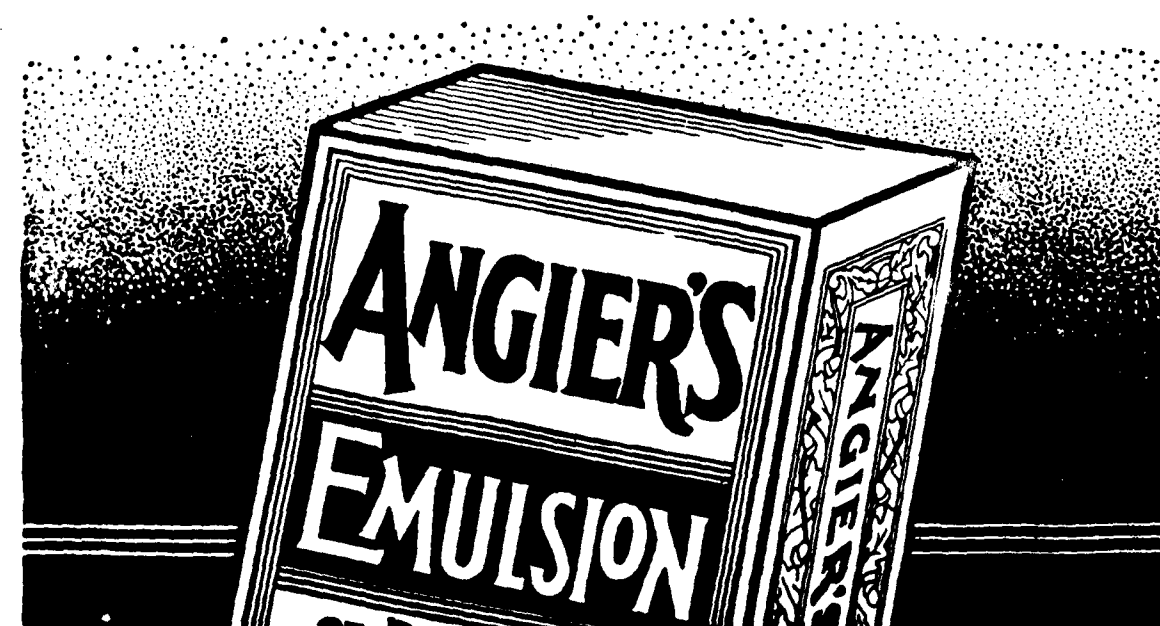
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