

Indian Medical Journal

Aug. 1935



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THE Indian Medical Journal

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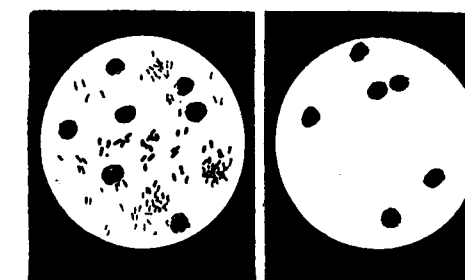
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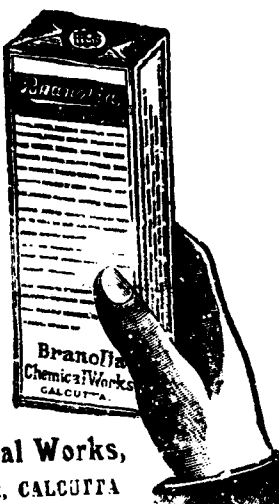
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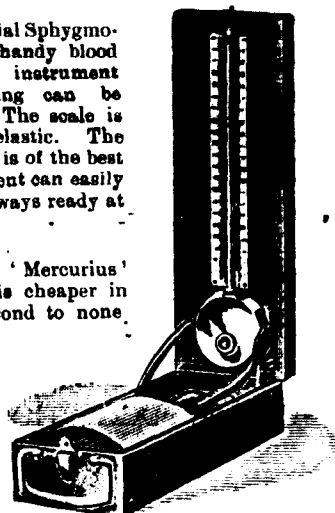
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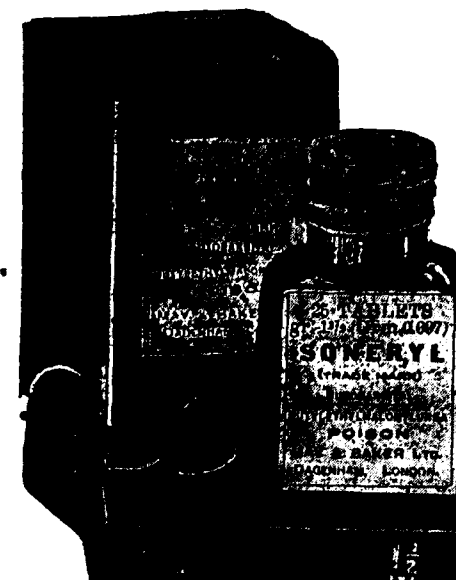
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Original Articles

LABORATORY METHODS OF DIAGNOSIS—THEIR VALUE, LIMITATIONS AND CLINICAL APPLICATIONS IN GENERAL MEDICAL PRACTICE

DR. P. MURUGESAN

Hony. Bacteriologist (Research)

Govt. Pathological Institute,

Medical College, Madras

Every one knows that the Laboratory method of diagnosis serves only as an aid to the clinician. It is only occasional that the physicians resort to Laboratory aid in their daily practice. They do so when they want for their own satisfaction to get their clinical investigations confirmed by a laboratory test, or when they are confronted with a difficulty to arrive at a definite conclusion as regards any diagnosis with the clinical evidences before them; or if any of their patient desires to know whether the treatment given to him is radical and thorough such as in the case of antisyphilitic treatment where one wishes to know whether the Wassermann's reaction of the blood serum after a course of treatment is negative or not. Again in simulating diseases such as the Enteric fever or the Typhoid form of Kala Azar when the physician wants to exclude one or the other by a serological test, there is a necessity of going in for a blood test. Now-a-days in cases of malarial infection hardly any physician seeks the laboratory help except when he wants to exclude it in clinically suspected cases of typhoid fever, kala azar or pulmonary tuberculosis and suppurative affections, etc. But very often occasion arises to seek the laboratory help in cases of lung affections for the detection of T. B. in the sputum in clinically suspected cases of tuberculosis of the lungs.

In my opinion a laboratory intended for medical diagnosis serves a most useful purpose in not only maintaining the reputation of a physician but also very often saves a patient from falling a victim to the evils of erroneous diagnosis which is likely to occur in certain instances in spite of great care. Wherever clinical evidences are obscure for a correct diagnosis, it is most advisable both in the interest of the physician and the patient to get the diagnosis already arrived at by clinical evidences, confirmed or excluded by a laboratory

test such as the case may require. I know of instances where it so happened in hospital and private practice in spite of great care that cases that were being treated for Typhoid fever for a fairly long period, say a month or 40 days, were later on proved to be after all cases of early Kala Azar by serum tests. Therefore in such cases of suspected typhoid fever not exhibiting clear clinical evidences (*i.e.*, atypical forms) and also in clinically confirmed cases of typhoid fever, it is most desirable, I think, to have the widal reaction done on the blood serum of such cases and the clinical diagnosis confirmed as a rule before proceeding with the routine treatment.

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Apart from the valuable aid rendered by the laboratory in diagnosis, a physician can also utilize it as a guide to judge whether a certain line of treatment adopted by him in a certain case is doing good to the patient or not, in checking the disease such as in cases of antisyphilitic treatment, in the treatment of diabetes mellitus and tuberculosis of the lungs etc., where a clinician may not be able to gauge the results of the treatment by way of clinical signs only—I mean while aiming at a radical cure.

I may mention another valuable help rendered by the laboratory in diagnosis. Specimens of faeces are sent to the laboratory often on the suspicion of Ankylostomiasis for the detection of the ova of the worms. While searching for the ova under the microscope, cysts of amoeba histolytica are seen instead of the ova of worms. But for the microscopic examination, such cases often go undiagnosed since chronic amoebiasis presents various clinical manifestations mostly perplexing to the physician.

Again laboratory help is really indispensable in the diagnosis and differentiation of anaemias primary and secondary; and to differentiate malarial enlargement of the spleen from leukaemic spleen, etc.

Now coming to the limitations of laboratory methods in practice.—In certain cases the laboratory will be the last thing to be resorted to and at times even useless to think of as an aid to diagnosis, *e.g.*, in cases of pulmonary tuberculosis in its early stages if the physician could only depend upon the negative report of a microscopic examination of sputum for T. B. and exclude tubercular infection on the strength of such findings as all in all, he will be doing harm to the patient. Similarly absence of malarial parasites or L. D. bodies in a few fields of a blood film under the microscope or at times even in a few slides of blood films examined, especially in the case of kala azar,

does neither exclude chronic malaria nor kala azar altogether. To be satisfied with a blood film examination and rely on a negative report in the diagnosis of kala azar is utterly useless. A physician might do better by confining to his clinical data for the diagnosis than to resort to such film examination in kala azar or chronic malaria.

Similarly, in the face of definite clinical evidences and a history of infection, a negative Wassermann's reaction report of a laboratory on the blood serum of a patient is greatly disputed and might be ignored. Better give your patient the benefit of your clinical doubts than to rely on such a reaction whether it arises from a wrong technique in the laboratory or as the usual fallacy of the reaction itself. But, on the other hand, a positive report of W. R. on the blood serum of a patient even with the denial of a history of exposure to infection, and in the presence of certain clinical signs suggestive of syphilis is really valuable as a guide to diagnosis and might be relied on and the treatment be proceeded with.

Again when more than one laboratory test are available in the laboratory diagnosis of a certain disease, the physician has every right or at least he should insist on the application of all the available tests before reporting on the results of the laboratory investigations, especially in the case of serological tests. If one of the test available is applied in a certain case and is negative, the other available tests for the diagnosis of same disease are to be applied before the laboratory report is concluded by the bacteriologist, *i. e.*, the results of all the tests are to be taken into consideration before arriving at the positive (+), negative (—) or a doubtful (+) nature of the reactions is made out, *e.g.*, in the case of serological tests for the diagnosis of kala azar there are three laboratory tests, *viz.*, the Aldehyde Test (Napier), the Precipitation (Globulin) test (Brahmachari) and the Ureastibamine test (Chopra). These tests are all based upon a *specific Globulin precipitation* and they behave differently with the different stages of the disease.

The Laboratory Bacteriologist who, already labouring under the difficulty of not being provided with the history of the case the specimen of which is sent for the test, will not be able to guess the stage of the disease so as to apply the required test; hence a history of the case is necessary for laboratory diagnosis. The Aldehyde test for kala azar is not always positive in the very early stage of the disease. There have been pucca cases of early kala azar proved negative by Aldehyde test but had shown strongly

positive (+ +) reaction with the other two tests, *viz.*, Brahmachari's and Chopra's. These were no doubt early cases and proved to be so by specific treatment and subsequent cure. If a detailed history of the case was available and the stage of the disease could be known the required test might be applied straightaway which could have saved much time and labour. If only Aldehyde test was done in a case of early kala azar and a negative report obtained, and if the clinical diagnosis was set aside by the physician on the strength of this report both the bacteriologist and the physician would have committed a great blunder and harmed the patient.

The recent introduction of biochemical tests into the laboratories in India has brought the general practitioner in closer touch with the laboratories and it might be possible in the long run to make the laboratory aid more frequently resorted to than ever before as the biochemist advances in his discoveries of quicker, less complicated and above all cheaper methods of laboratory diagnosis, as Napier's Aldehyde test and Chopra's Ureastibamine test for the diagnosis of early kala azar and Kahn's precipitation test for syphilis. Tests like these have not only rendered it possible to diagnose the disease quicker but also at a moderate cost for our patients. These tests are so simple that they might be carried on in every headquarter hospital and in some cases at the bed side of the patient as the reagents and appliances required are either a chemical or reagent like "an antigen" and few test tubes, etc., easily procurable. Besides such advantages these new biochemical tests have increased largely the scope of their application in a large number of cases by a larger number of practitioners, considering the cheapness and the quickness with which the tests are finished. We owe a great deal to the biochemist for such advances made in the serological diagnostic tests and we hope for further discoveries of the kind.

The practical application of microscopic methods of Laboratory Diagnosis to clinical medicine.—Microscopic examination of blood films for the detection of parasites in acute malaria and the study of the characteristic blood pictures under the microscope, peculiar to certain diseases, are of immense value to the physician. A routine examination of blood films in all cases of fever and a study of the blood picture in a number of diseases like chronic malaria, pneumonia, tropical abscess of the liver, other inflammatory and suppurative affections, meningitis, septicæmia, endocarditis, measles, chronic

tuberculosis, etc., etc., each of which presenting certain specific changes in the leucocytes, the morphology of R. B. C's and similar changes, are really of great value in the diagnosis and also in the prognosis and in judging the course of certain diseases. In the absence of malarial parasites in the peripheral blood after quinine administration or in chronic malaria, the characteristic blood changes (a picture as it is called) consequent on the infection serve as a useful guide in the diagnosis of malarial infection.

Again in hospitals and in private medical institutions where there are no facilities for Vidal (agglutination) test for the diagnosis of typhoid fever, if only a high power microscope is available, a close study of the blood picture during the first and second weeks of the illness is really of great value in confirming the clinical diagnosis.

The practical application of the serological tests like the complement fixation reaction, the gellification and precipitation tests and the agglutination reaction will be discussed in the second section of the paper in connection with the sero-diagnosis of syphilis, kala azar and typhoid fever.

II

KALA AZAR

The following is a regular history of the development of the diagnostic methods from the beginning of our scientific investigation of kala azar. For some years before Col. Donovan discovered the *Leishman Donovan* bodies in the peripheral blood of kala azar the laboratory methods of confirming clinically suspected cases of Kala Azar were:—

I. (1) *Blood picture.*—A differential leucocyte count showing a marked polymorphonuclear leukopenia and a *large Mononuclear increase*, with occasional eosinophilia. Presence of endothelial cells and fragility of large monos etc. (eosinophilia was attributed to ankylostomiasis or other helminthic infections often associated with kala azar cases).

(2) An absolute W. B. C. count showing nearly always 3000 to 4000 W. B. C.'s per c.m.m. of blood.

(3) A fairly high hæmoglobin estimation unlike in malaria.

(4) Increased time of the coagulability of the blood.

(5) Diminished alkalinity of the blood.

II. *Microscopic.*—Since the discovery of the parasites in peripheral blood, we were going on with this laborious method

of detecting the parasites. *We had to hunt slide after slide* to find a parasite and that with negative results in most cases except in cases with inflammatory complications, when the leucocytosis produced by the inflammatory processes, enabled us to come across a larger number of leucocytes in peripheral blood and thus increased our chances to detect the parasites.

III. *Spleen puncture.*—When the method of microscopic examination of peripheral blood was a tiresome one and was not of much use to the physicians, the *spleen puncture* was resorted to, which, owing to the unnecessary fear of hæmorrhage created in the minds of the junior practitioners was limited only to selected inpatient cases in selected institutions and by selected specialists. I said 'unnecessary fear,' for, the spleen puncture diagnosis was of late a routine method in the out-door department of the Calcutta Tropical school by Dr. Napier prior to the discovery of his Aldehyde test, without any untoward results.

IV. *Culture.*—When spleen puncture smears failed to show parasites in clinically suspected cases, *culture method* of diagnosis on the special blood agar media (the N. N. N. media and Row's media) was adopted. Unfortunately this method of diagnosis was not possible to be done in ordinary hospitals except with the help of a protozoologist or at least a man with laboratory experience of growing the parasites and so was limited to big institutions.

V. *Globulin Test.*—Later Dr. Brahmachari published his discovery of the *specific Globulin precipitation test* wherein by the addition of Kala Azar serum to distilled water the specific globulin precipitated. This was of some service to a large number of practitioners in the diagnosis of Kala Azar. This is a characteristic precipitation forming an opaque colloidal solution in distilled water and gross particles of globulin sticking to the sides of the test tube and the bottom of the tube. This again was found to possess certain fallacies. As Globulin precipitation occurred in certain other febrile conditions such as severe typhoid infections, etc., it was not considered to be a specific test.

VI. *Formol Gel test.*—Then came the "Formol Gel" test to replace the Globulin precipitation test. This is a simple test and consists in putting a drop of clear suspected serum on a dry slide and gently inverting it over a watch glass containing commercial formalin or directly on to the mouth of the bottle containing the formalin so as to put the drop hanging at the centre of the mouth,

without touching its edges, when immediate gellification of the serum takes place with varying degree of opacity due to the precipitation according to the stage of the disease.

VII. *Aldehyde test*.—Later on came the *Aldehyde test of Napier*. This was after the model of Gate and Papagasta's gellification test for syphilis, viz., the addition of a fairly big drop of commercial (40%) formalin to about 1 or 1.5 c. c. of clear blood serum of a suspected case of kala azar. A positive reaction is indicated by quick precipitation and a simultaneous gellification binding the precipitate thus formed and the serum tested is converted into an opaque gelly-like mass. The degree of reaction, viz., the gellification and precipitation depends upon the stage of the disease. The serum remains unaltered in negative cases. The positive reactions are noted by signs $\pm$, +, ++, +++, and ++++ according to the intensity of the reaction. The time taken for the complete gellification and precipitation is also of importance because in early cases and in Kala Azar of children generally the reaction is not manifest before 24 hours. This test is not of much use in early and very early cases.

VIII. *Ureastibamine test*.—Very recently *Chopra's Ureastibamine* test was introduced and it is a more reliable test in early and very early cases of kala azar. This test consists in gently adding a solution of ureastibamine to the serum to be tested, preferably to 1—5 or 1—10 dilution of the serum in saline. Positive reactions are indicated by a cloudy precipitate at the junction of the two fluids. This test has one difficulty. Some experience and skill of observation are required, for, in non-kala azar cases especially in prolonged febrile conditions like typhoid fever, a certain amount of precipitation takes place, but by experience we can exclude it. In kala azar we get a cloudy precipitate while the other is a flocculent fine precipitate; the precaution being that on no account is an undiluted serum to be used in the test. *Summing up* the results and observations we will find in the Chopra's and Brahmachari's precipitation tests useful guides for the detection of the disease early even within a month of the illness while the Aldehyde test is reliable in fairly advanced cases of more than three or four months duration.

In the typhoid form of kala azar a weak ($\pm$) Chopra's and Brahmachari's tests will be of great service in the diagnosis of kala azar early, especially when a negative Widal's reaction for B. Typhosus is also obtained in such cases.

As the cases of kala azar referred to in private practice are invariably early or very early ones, I find it expedient to carry on all the three tests in every case before reporting. On the investigations of the serum, which I term the A. B. C. test for kala azar (A. for Aldehyde test, B. for Brahmachari's and C. Chopra's), I sum up the results obtained in the three tests and then report on the case. This way I have been able to pronounce my results very accurately in my laboratory practice. A number of clinically atypical typhoid cases were proved to be early kala azar by serum tests.

In fact all these reactions consist in the detection of a specific Golbulin in the serum of kala azar patients. In one case we throw it down in distilled water, in another we bind it into an opaque gelly and in the third we accelerate the precipitation and float it on the top of a fluid.

A few specimens of the results obtained by the three serological tests for Kala Azar in varying stages of the disease are given here so as to present a picture reading:—

Case I.—*Very early case of K. A.*

Test 'A' = —
Test 'B' = +
Test 'C' = +

Case II.—*Early case.*

Test 'A' = +
Test 'B' = +
Test 'C' = ++

Case III.—*Fairly advanced case.*

Test 'A' = +
Test 'B' = ++
Test 'C' = ++

Case IV.—*Moderately advanced case.*

Test 'A' = ++
Test 'B' = ++
Test 'C' = +++

Case V.—*Very well advanced case with complications.*

Test 'A' = +++
Test 'B' = +++
Test 'C' = ++++

(A. Aldehyde test. B. Brahmachari's precipitation test. C. Chopra's ureastibamine test.)

If only a systematic serological test be carried on in cases of repeated attacks of fever that are quinine resistant with enlargement of spleen, in cases of fever of unknown origin and in mild, ambulatory or atypical forms of typhoid-like cases before treating them in our daily practice, we could surely

detect and fish out a number of early and very early cases of kala azar among such patients.

III

SEROLOGICAL METHODS OF DIAGNOSIS IN SYPHILIS

Noguchi's modification of Wassermann Reaction.—As already pointed out a negative W. R. is not undisputed while a positive W. R. is a strong presumptive evidence of syphilis and an absolute indication for antisyphilitic treatment. But a negative reaction is indeed of great value as a guide after treatment in cases which showed a positive reaction before treatment.

If in cases clinically suspected to be syphilis, a negative reaction is reported from a laboratory at one examination it is advisable that the blood should be examined at a later interval before the treatment is decided upon, for, in certain instances in spite of great care on the part of the laboratory worker, it so happened that subsequent examination proved positive.

Modification of Noguchi's test.—This is an innovation devised by me at the Coonoor Pasteur Institute in 1915-16. It consists in substituting the human corpuscles suspension from an altogether different and apparently healthy individual for corpuscles from the patient's blood itself. All that is required is to draw an extra quantity of blood from the patient whose blood is to be tested a portion of which being utilized for preparing the corpuscle suspension and a portion for the serum for the test. This is strictly speaking a simplification of the Noguchi's test and the test is possible where anti-human hæmolytic serum is adopted in the procedure.

Kahn's precipitation test.—This test was recently introduced into the laboratories in India. Dr. R. L. Khan (U. S. A.) says, that in parallel tests over 300,000 sera he found a close agreement between Kahn and Wassermann tests for syphilis. He considers his test as highly specific in the sero-diagnosis of syphilis and is further claimed to be more reliable than W. R. test in early cases of syphilis. It is indeed more economical and the report can be obtained quicker than in the case of W. R. test. The only special reagent used in this test is an antigen prepared by Ethereal extract from Bacto Beef heart and preserved in alcohol after cholesterinization. A strong positive reaction is indicated by a heavy precipitate, the antigen control and the negative reactions showing mere opalescence; vary-

ing strength of antigen is used in varying quantities of the serum to be tested so as to obtain the intensity of the reaction.

I have my own doubts as to the specificity and especially the sensitiveness of reaction in this test.

Wassermann's and Kahn's Sero-diagnosis.—Instead of suddenly replacing this time honoured biological test, viz., Wassermann's, by a recently introduced biochemical test like the Kahn's, on the consideration of the cheapness or the simplicity of the technique in the Kahn's test, I would suggest that a close study of the exact nature of the so-called puzzling substances of the serum, viz., the complement and amboceptor or antibodies and further researches from a biochemical point of view might be carried on and the biochemical processes, if any, that underlie the phenomenon of hæmolysis and that of Bordet-Gengou might be revealed in the light of the modern scientific observations.

In fact there is a close analogy between the Wassermann's and the Khan's tests, viz., we have (1) *the positive serum*, (2) *the special antigens* (perhaps this differs in the improved and cholesterinized form in the latter test) and (3) *the Normal saline* in common to both these tests in the positive tubes. The vital difference between the two tests is that in one we have a specific precipitate and in the other hæmolysis as our indicator of the nature of the reaction. In Wassermann we read the reaction through hæmolysis as an indicator as it were. To put it clearer, what I think is that a kind of fine characteristic biochemical precipitation taking place simultaneously in the positive tube in W. R. renders the R.B.C's in the suspension less susceptible to the influence of the hæmolysing agents and consequently there is inhibition of hæmolysis. This is evident from the fact that in tubes showing a very strongly positive reaction, i.e., complete inhibition of hæmolysis, we often notice the corpuscles thrown down the bottom of the tube in clumps or in a sticky mass at times difficult to break by lightly shaking the tube, unlike the ordinary suspension of corpuscles in normal Saline which could be evenly and quickly distributed, after once allowed to go in sedimentation by gentle shaking. This is only my theoretical guess from my observations. I can't assert it unless experimentally proved. I am further led to believe that such a precipitation in the positive Wassermann tube is accelerated in the Kahn's test by the cholesterinization of the Kahn's specific antigen.

For a positive W. R. we count upon the degree of inhibition of hæmolysis. The theory tells us that it is due to the so-called deviation of complement. If only a close and very careful investigation of the nature and the cause of the inhibition is made by the biochemist I would safely presume that he might come to the conclusion that the so-called deviation of complement is nothing but a change in the chemical environment in the mixture which is purely responsible for the inhibition. What I conjecture is that the chemical environment of the mixture in the positive tubes containing the antigen might be so altered in its salt contents as well as the H ion or the Hydroxylion concentration as the case might be, that the conditions favourable for the occurrence of hæmolysis might thereby be removed on the addition of the immune serum to the antigen mixture. The antigen solution used in W. R. test, being prepared from acetone insoluble lipoids after extraction with ether and preserved in alcohol, is evidently capable of altering the chemical environment. In support of this statement we have certain chemical agencies actually bringing about the process of hæmolysis. Why not the inhibition of such a process be brought on by a chemical environment contrary to the one capable of producing hæmolysis? So long as the exact nature and the composition of the serum elements are not known to us and if further researches based on the chemical theories such as those I conjecture, are carried on, I am sure the biochemist will find his way to explain the exact nature of these substances of the serum and do away with such vague terms as complement, amboceptor or antibody and so on.

The originators of these biological theories were content with such terms like complement etc., because the science of biochemistry or pathological chemistry was not so well developed in their days. Now that the services of biochemistry and chemical pathology are so far advanced that the workers in these fields might explore into such theories and render them modern and scientific.

As far as my knowledge of the application of Wassermann test to the sero-diagnosis of syphilis goes, I believe that Wassermann's test, as it is, is second to none except any modification of it based on the discovery of the exact nature of the serum elements pertaining to original Wassermann and the real cause of the inhibition of hæmolysis in the positive tube. There are a good many biochemical substances like the "specific Globulins" being discovered day by day possessing peculiar properties of their own.

These are my own views on these tests and I leave it to the scientists in the field for further researches. I earnestly hope that this contribution of mine will be of ultimate use, in the advancement of the serological tests in the right direction.

IV

RECENT ADVANCES IN VACCINE THERAPY

Lastly I would like to put before the readers a few conclusions that I have been able to draw from my own experience and observations regarding the *most abused and neglected subject of vaccine therapy* and with special reference to the (1) *specific and non-specific methods of immunization by vaccine treatment*, (2) *the foreign protein theory* as applied to vaccine therapy and (3) *the biochemical aspect of the treatment* with bacterial vaccines and the vaccines themselves according to the recent advances made in vaccine therapy. Originally at the beginning of vaccine therapy as one of the specific methods of combating bacterial infections, much importance was attached to the use of autogenous vaccine in bacterial infections. It was thought after very careful experiments in vitro and in vivo, the immunization by vaccine treatment was strictly specific. In the absence of facilities for the preparation of autogenous vaccines, stock vaccines, corresponding to the microbes with which the patients are infected were used with certain amount of success in all cases as auxiliary to other medical and surgical measures pertaining to a particular affection.

After the last European war owing to their war experiences, the pioneers of vaccine therapy had to change their own views with regard to the specificity of vaccine treatment. I think I will do well to put their views in their own words. About the year 1919 the originator of vaccine therapy, Sir Almroth E. Wright writing on "the lessons of the (European) war" recorded certain instances of collateral immunization and confessed openly the failures of his own theories of vaccine therapy. He said in the course of his lecture "I confess to having shared the conviction that immunization is strictly specific." "20 years ago" he continued "when it was alleged before the Indian Plague Commission that Antiplague inoculation had cured Eczema, Gonorrhœa and other miscellaneous infections (because his belief about the specificity of vaccine therapy was strong then) I thought the matter was underserving of examination. I

took the same view when it was reported in connection with antityphoid inoculations that it rendered the patients much less susceptible to malaria." He further added "Among thousands of patients treated by vaccine therapy in private practice and in hospitals, it happened every now and then that a patient was treated with a vaccine which did not correspond with his infection and that the patient was indubitably benefited." This was specially the case in field hospitals during the war time, as they could not get the stock of all the vaccines, the wounded were treated with any vaccine then in stock irrespective of the infection with, no doubt, good results. Cases of gonorrhœal complications were treated by intravenous injections of typhoid polyvalent vaccine with remarkable results. This non-specific method of immunization was later introduced into the Civil Hospitals and private practice and gradually in several institutions, useful spheres for the practical application of this novel method were thought of, and a large number of cases of gonorrhœal complications were treated successfully by the intravenous injections of T. A. B. vaccine. Best results were obtained with old vaccines preserved in glass bulbs for more than 6 months and nearly a year. Originally the idea of preferring old vaccines to new ones was that the toxicity would have been reduced by keeping and for this reason Thomson's detoxicated vaccines were commonly used for intravenous injections. Rheumatic affections due to oral sepsis and joint affections due to similar causes were also successfully treated with T. A. B. Vaccine given intravenously.

Acute cases yield to this method very quickly in two or three injections. The effusion in the joints and the urethral discharges dry up quickly. But the disadvantage of this method though absolutely harmless, is that it is unfit for private practice owing to the alarming general reaction, such as very high temperature, severe rigors, etc. Symptoms of cystitis disappear under this treatment without any other medical measures such as drugging or washing, etc. In fact gonorrhœal complications intractable to all medical and surgical measures are very successfully treated.

Great caution is required in selecting the initial dose for intravenous injection as in some cases even 25 millions have produced severe general reaction. In chronic cases up to 200 millions may be injected at intervals of six or seven days and not earlier though the negative phase is generally shorter in this method than in the subcutaneous method.

Another instance of non-specific immunization is that a number of filarial complications are treated with bacterial vaccines, generally by a mixed Staphylo and Strepto stock vaccine with much benefit.

The specificity of the vaccine therapy having been thus discredited the question arose as to how the cure is brought about by the non-specific method of immunization by bacterial vaccines. To this no satisfactory answer could come to us from the vaccine therapists in the field. We turned to the biochemist and he held the theory that the aminoacids of bacterial origin naturally produced in the old vaccines, by keeping, would have been responsible for a mental shock when the stuff is injected into the vein and which by giving rise to high temperature was responsible for bringing about a drying up of the effusion and discharges and consequently killing the causative organisms (Pyrotherapy as this was called for the time being).

While discussing about this method of treatment with some prominent biochemists they suggested that a biochemical or chemical analysis of the *old stuff in the bulbs* be done.

On analysing the *stuff* chemically it was found that the chemists detected minute traces of silicates and double salts of potassium and sodium suspended as it were in a colloidal form in the original vaccine emulsion in the presence of amino-acids of bacterial origin.

I prefer to call the contents of the bulb a *stuff* because I was convinced that we were then carrying on a most empirical line of treatment, especially in view of the fact that the specificity established with regard to vaccine therapy has been experimentally and therapeutically disproved and confessed as such by its author himself.

I did believe in this analysis and the source of these inorganic salts is evidently the glass tubing out of which the bulbs are manufactured and also probably from the test tubes used in the process of preparing the stuff. As we keep on shaking and shaking the stuff for hours together in test tubes of glass it is quite likely that these products enter the emulsion in such minute quantities as is generally the case with such products if kept in glass-ware for a long time. These *inorganic salts* in their *infinitesimal doses* quite possibly contributed to a great extent along with the *amino acids* present in them in effecting the cure. In support of this I might men-

tion here the fact that certain preparations of colloidal metals are now-a-days claimed to possess similar therapeutic values independently of the bacterial vaccine.

The real value of the Prophylatic use of vaccines is yet to be proved. I think it is Proyhylaxis by mere suggestion.

Before I close this part of my paper I like to briefly mention in a few lines about the laboratory methods of diagnosing a few other diseases such as typhoid, early leprosy, long standing chronic gonorrhoea, urethritis, filariasis and amœbiasis.

In typhoid fever a positive Widal is always reliable. A negative reaction does not always exclude typhoid infections.

The absence of the specific organisms by the microscopical examination even if repeatedly done does not absolutely exclude any of these diseases. Better no importance is attached to the negative report on microscopical findings in such diseases in preference to clinical evidences.

In the absence of positive microscopic findings in the aforesaid diseases, complement fixation tests in leprosy and old gonorrhoeal infections with the respective specific antigens, a typical blood picture in filariasis and the presence of cysts in the fœces of suspected cases of amœbiasis are of really great value to get one's clinical diagnosis confirmed or excluded according to the positive or negative reports from a laboratory.

V

CONCLUSIONS

1. A close co-operation of the general Practitioner and the Bacteriologist is always necessary in Laboratory Practice.

2. In order that the full benefit of the laboratory method of diagnosis be enjoyed by the general practitioner a short history of the case mentioning the duration of the illness and the prominent signs and symptoms or at least the provisional diagnosis of the case should accompany each specimen sent to the laboratory especially in case of serological tests.

3. Laboratory aid in diagnosis is indispensable to the general practitioner in his daily practice.

4. The reputation in laboratory practice depends upon the conscientious work of the laboratory practitioner unbiased by the clinical

history of the case furnished with each specimen.

5. As a rule the Negative reports on laboratory diagnosis should not be applied to the cases referred to unless corroborative of the clinical evidence.

6. Wassermann's or the Noguchi's Modification of W. R. test is second to none in the diagnosis of syphilis with regard to its sensitiveness and specificity of reaction.

7. On no account should a newly introduced biochemical test in serological diagnosis be adopted in a laboratory in preference to any of the existing equally useful biological tests such as W. R. test before every laboratory practitioner is convinced of its efficacy and on no account should such replacement be done merely for the consideration of its cheapness or the simplicity of the technique or at least till we are well advanced in our knowledge of biochemistry as applied to medical science.

8. It might be safely presumed that almost all our biological theories were based on certain biochemical processes which the orginators of such theories were unaware of as the science of biochemistry was not then so developed as at present.

9. A good deal of chemical and biochemical research is yet to be done on the chemical and biochemical aspects of our biological theories and the exact nature of the elements of the sera is yet to be studied and worked out on modern biochemical lines of research.

10. The close co-operation of the bacteriologist, the physician, the chemist and the biochemist is greatly needed for the scientific advancement of laboratory diagnostic methods.

11. Vaccines are not so specific as they have been hitherto considered and "confident dogmatic belief that immunization is strictly specific" should be given up.

12. The superiority of a vaccine either auto-genous or stock is judged by the immunizing properties it possesses rather than by its source. The intravenous method is the most effective and the only method of overcoming systemic infections by old vaccines. The subcutaneous method of injecting vaccines in systemic infections should be discouraged as a therapeutic measure wherever possible.

A REVIEW OF BLOOD SLIDES WITH SPECIAL REFERENCE TO MALARIA*

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SUMMARY OF TABLE I					
M.P.		Total M.P.	Other than M.P.		Grand Total
pos.	neg.		pos.	neg.	
1392	4295	5687	16	211	227
					5914

These slides were examined in the Pathological laboratory attached to the Berry-white school of medicine, Dibrugarh, Assam, during last 10 years from March 1924 to October 1933 and the following figures were collected from the records of that laboratory.

It will be noticed that 5914 blood slides were examined during the period under consideration, out of which 5687 films were for malaria. 1392 of them were found positive or 13.92%; 227 slides were examined for other diseases and the result noted at the bottom of page 401.

TABLE I
MONTHLY STATEMENT SHOWING, YEAR BY YEAR, ALL BLOOD SLIDES SENT FOR EXAMINATION WITH THEIR RESULTS

Year	Blood Slides	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total	G. Tol. M. P.
1924	B. T. ...			4	5	12	6	19	17	11	10	9	9	102	
	Positive Q. T. M. P. ...										1	1		2	217
	M. T. ...			16	12	8	6	22	14	14	11	8	2	113	
	Neg. M. P. ...			11	18	22	26	41	30	42	21	31	37	279	496
	Positive } L. D. Body			13	14	04	03	05	02	03	01	03	05		
	Negative }													33	
1925	B. T. ...	4	11	3	11	18	13	6	12	12	4	5	4	103	
	Positive M. P. Q. T. ...		1	1			4	3				1		10	
	M. T. ...	2	4	5	10	11	12	22	29	14	12	9	12	142	
	Neg. M. P. ...	28	19	28	23	15	21	38	52	43	62	53	53	435	
	Pos. ...		0	0	0	0	0	0	1	1	1	0	0	3	255
	L. D. Body														
	Neg. ...		1	6	2	4	3	4	6	4	4	5	5	44	690
	Pos. ...		0											0	
1926	Microfilaria														
	Neg. ...		1											1	
	Pos. ...														
	Pos. ...														
	Neg. ...														
	Pos. ...														
	Neg. ...														
	Pos. ...														
	Neg. ...														
	Pos. ...														
	Neg. ...														

* Received for publication on 5-4-35.

Year	Blood slides	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Tot.	G. Tot. M. P.
1927	Positive B. T.	2	2	1	1		2	5	1	5	8	2	4	28	70
	Q. T.	2		1									2	5	
	M. P.	8	1		1	4	4	10	6	8	8	2	2	57	
	Negative M. P.	51	80	40	20	16	49	54	28	48	47	56	46	480	
	pos.	8	0	1			0	8	0	0	0	0		7	
	L. D. body	7	3	5			2	10	1	1	8	1		88	
1928	Microfilaria neg.	1		1	1	1								4	98
	Positive B. T.		1	2		1	8	10	6	4	8		1	81	
	Q. T.		3	2					1	1	8	8		14	
	M. P.	2	2	1	3	2	11	15	2	5	5	3	6	53	
	Negative M. P.	35	34	23	13	20	32	47	55	39	36	40	42	416	
	pos.	0	0	0			0			0	0	0	0	0	
1929	L. D. body	1	8	4			1			2	8	1	2	17	64
	Microfilaria neg.													2	
	Positive B. T.		1		1			2	4		4	1		18	
	Q. T.			2							1		1	4	
	M. P.	2	2	1	1	1	1	5	11	2	5	8	8	47	
	Negative M. P.	41	31	18	30	12	37	48	22	31	28	29	24	351	
1930	pos.	1	0		0				0	0				1	108
	L. D. body	1	1		1				1	1				7	
	Microfilaria neg.							1				1		2	
	Positive B. T.	1		1	1		1	7	3	4	5	3	2	27	
	Q. T.	2		1	1		6	3	2	1	1	2	1	12	
	M. P.	18	15	9	9	5	25	42	46	46	35	44	31	325	
1931	Negative M. P.				1		0	0						1	438
	pos.				8		1	1						5	
	L. D. body													1	
	Microfilaria neg.													1	
	Lepa bacilli neg.							1						1	
	Positive B. T.	2	3		1	2	8	6	5	5	8	10	8	48	151
1932	Q. T.	3			2	3			1	5	3	2	3	22	
	M. P.	4	1	3	6	17	13	10	10	6	13	8	8	86	
	Negative M. P.	20	26	21	24	28	39	57	56	68	38	56	19	452	
	L. B. body	1						2				1	1	5	
	Microfilaria neg.										2			4	
	Piroplasm neg.				1									1	
1933	Positive B. T.	6	4	1			2	8	7	4	6	7	4	48	129
	Q. T.	5		1				2			2	2		13	
	M. P.	25	21	27	14	9	4	11	8	9	18	9	11	78	
	Negative M. P.						28	39	53	66	55	72	50	459	
	L. B. body			1			1							2	
	Microfilaria neg.													1	
1934	Lepa bacilli neg.				1	2								8	588
	Acid fast bac.			1		1								2	
	Piroplasm pos.			1										1	
	Positive B. T.														
	Q. T.														
	M. P.														

Year	Blood slides	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Tot.	G. Tot. M. P.
1933	Positive B. T.	5	2	2		3	7	9	10	4	10			52	185
	Q. T.	4				1	2	1	1	2	1			12	
	M. P.	1	1	1	4	4	11	17	10	20	2			71	
	Negative M. P.	36	35	38	42	58	71	81	95	72	65			593	
	pos.		0	1			0			0	0			1	
	L. D. body														
1934	Microfilaria neg.														728
	Positive B. T.		2	2			2			1	1			8	
	Q. T.		3											7	
	M. P.														
	Negative M. P.														
	pos.														

TABLE II

MONTHLY STATEMENT OF RAINFALL AT DIBRUGARH, ASSAM, FROM 1924—1933
(Collected from the Meteorological Observatory)

Years	January	February	March	April	May	June	July	August	September	October	November	December	
1924	0.92	1.7	1.97	5.34	15.59	16.71	34.9	22.98	13.97	8.12	2.59	0.0	124.79
1925	1.26	2.05	4.59	5.87	19.2	18.27	22.12	20.33	17.5	2.59	0.09	0.0	113.87
1926	0.88	0.81	4.21	7.01	12.02	15.61	27.77	10.18	7.0	11.58	2.41	0.36	99.84
1927	1.58	2.94	5.47	11.74	6.92	16.27	21.29	16.7	27.1	12.11	0.56	0.0	122.68
1928	0.59	1.34	4.81	5.88	16.01	22.35	19.91	21.8	18.69	7.92	1.71	0.41	120.87
1929	8.53	0.79	2.53	8.28	25.99	17.07	15.2	14.46	10.99	4.11	2.6	4.39	109.84
1930	0.94	0.9	2.89	13.67	3.18	18.82	8.53	19.64	26.17	13.6	3.5	0.39	112.23
1931	0.76	3.99	1.84	18.26	11.23	27.11	26.97	11.48	12.6	6.1	0.98	2.41	123.73
1932	2.99	2.37	2.94	4.85	20.61	26.89	18.23	21.58	12.56	7.09	5.08	1.88	127.07
1933	1.22	3.56	2.0	10.06	9.9	23.71	15.81	27.91	6.48	8.17	0.17	0.27	104.26
Total Monthly	18.49	27.46	27.38	118.64	183.09	252.88	275.5	244.45	205.47	98.58	21.29	11.91	

1. Total slides for L. D. body 197, out of which positive 16 or 8%.

2. Total slides for Microfilaria 21, out of which all negative.

3. Total slides for Piroplasm 3, out of which all negative.

4. Total slides for Lepa bacilli 4, out of which all negative.

5. Total slides for Acid-fast bacilli 2, out of which all negative.

Statement of 1392 positive cases of malaria of different types with their percentages.

B.T.	505	36'2%
Q.T.	100	7'1%
M.T.	787	56'5%

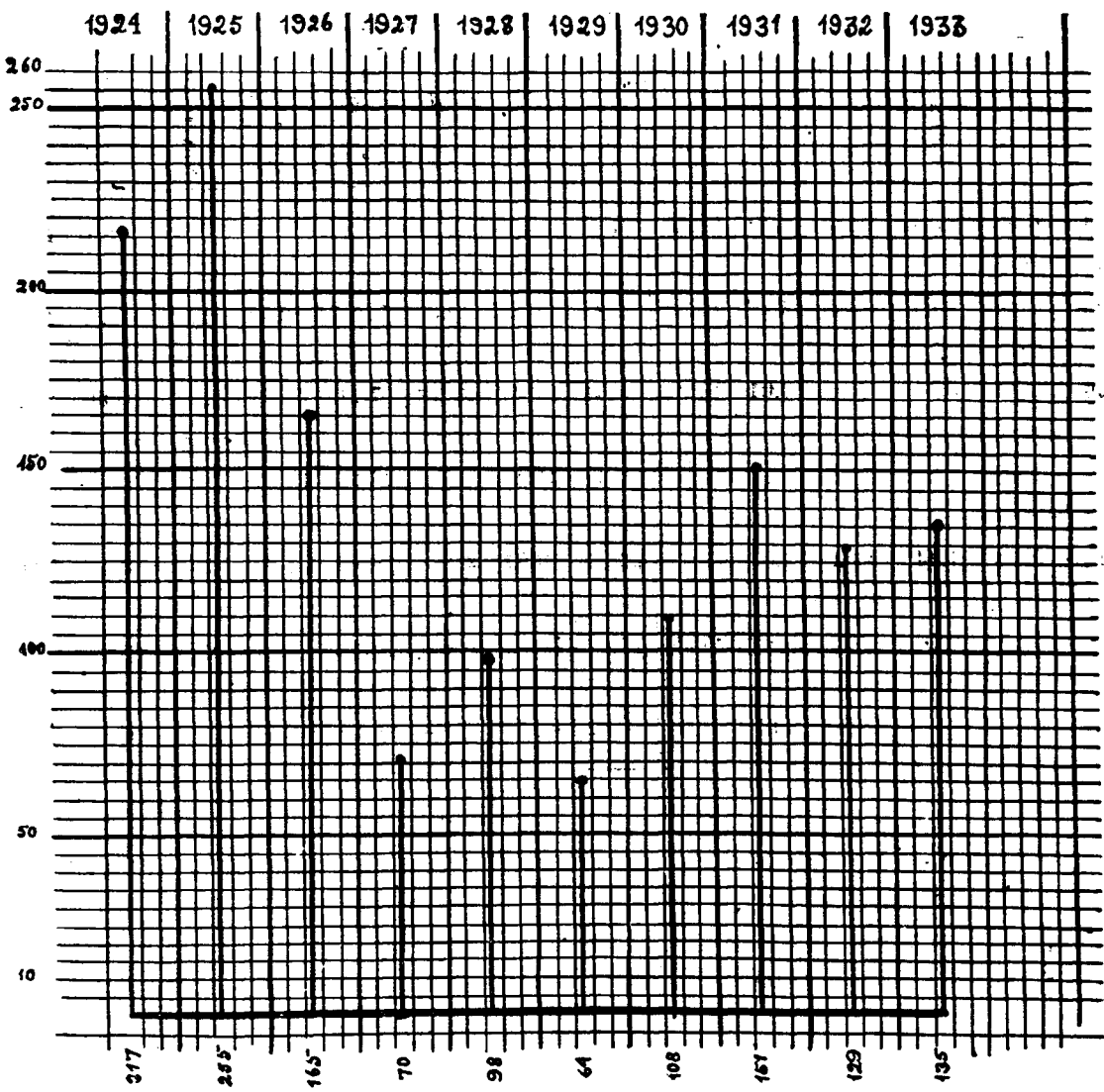
Malaria M.T. shows the highest figure and Quartan the lowest.

Comment of Graph 1

Highest in 1925, lowest in 1929. These figures approximately give the incidence of malaria in the subdivision of Dibrugarh from which the inmates of the hospitals are drawn. A reference to the rainfall (table 2) shows that

there was little difference in rainfall in 1927, 1931 and 1932. So, the low incidence of malaria in 1927 is probably due to some factors other than rainfall. Similarly comparison of rainfall figures of 1929, 1930 and 1933 point to factors other than rainfall as causing the lowest incidence of the disease in 1929.

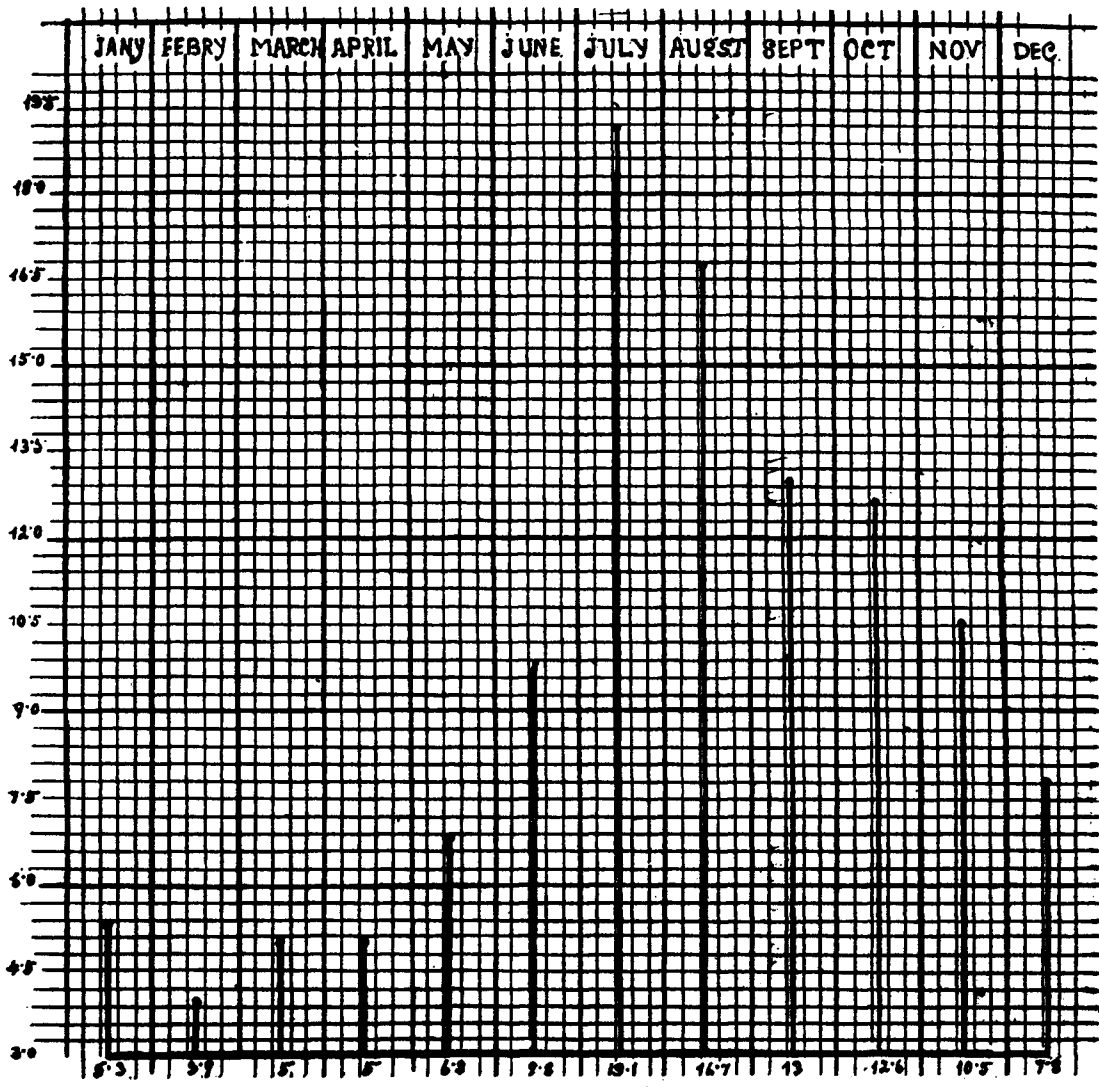
The highest rainfall does not tally exactly with the highest incidence of malaria. But roughly speaking highest incidence goes with pretty high rainfall. These facts are also borne out by comparing rainfall (table 2) with this graph.



Graph 1. Annual analysis of positive cases of Malaria year by year for 10 years (1924-32)

Comment of Graph 2

Highest in July. From February it gradually rises up to July and then falls gradually till December. Lowest in February. This is borne out by clinical experience.



Graph 2. Showing incidence of malaria month by month on an average of 10 years from 1924 to 1933

Comment of Graph 3

B. T. highest in July, lowest in January.
Q. T. " " January " " February.
April and May.
M. T. " " July " " February.

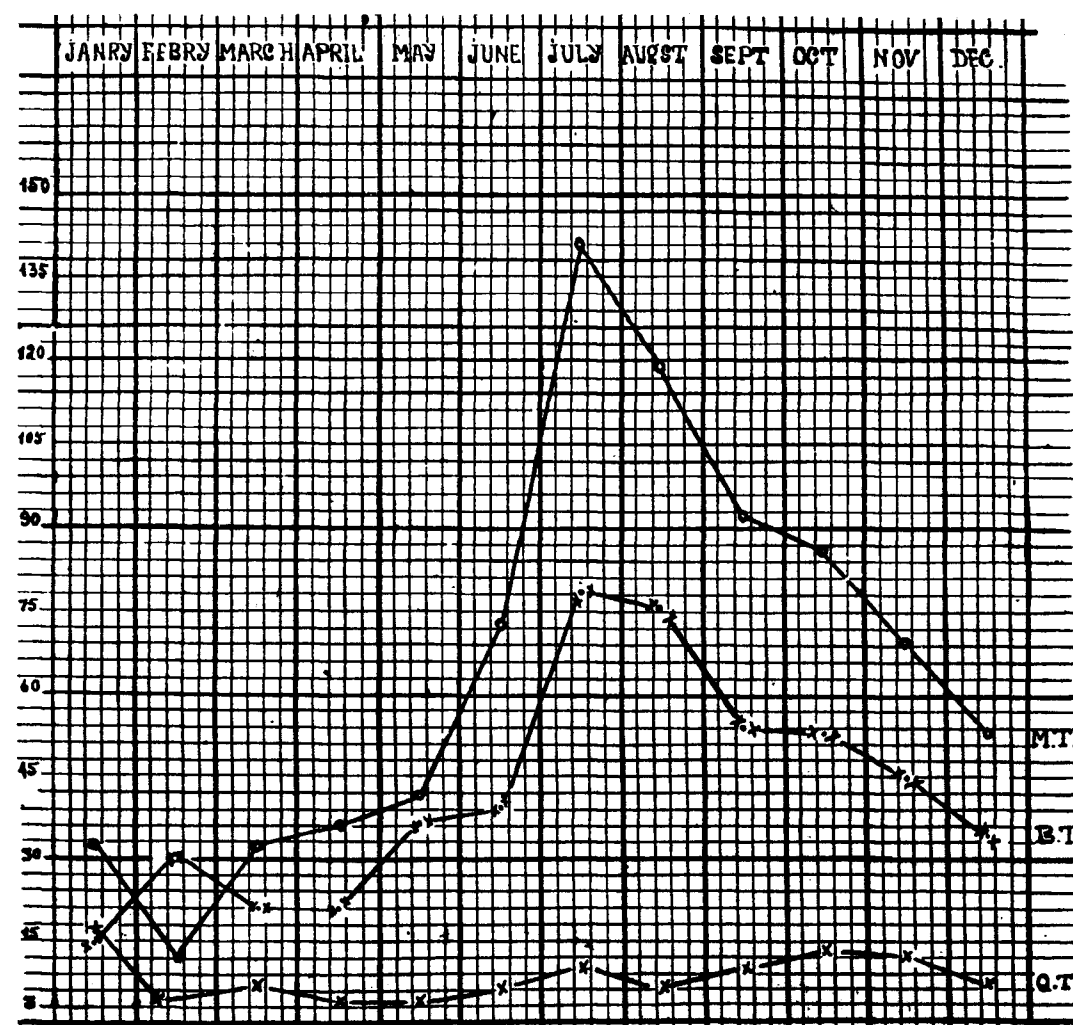
Comparison of these findings with the monthly total rainfall (table 2,) shows that there is a definite relation between rainfall and malaria in Dibrugarh. The highest rainfall is in July and the highest incidence of B. T. and M. T. infections run parallel with it. The lowest rainfall is in December and in the next two months we find the lowest incidence of all the three varieties of malaria. Quartan infection stands alone as an

exception by flaring up in the month following the driest one and dropping down to the lowest level in the next month of February. So we may roughly conclude that positive blood findings in malaria varies directly with the rainfall.

Averages of 10 years' monthly statements showing total and positive blood slides of malaria were examined in the Laboratory during the period from march 1924 to october 1933.

47'4% of blood slides were examined and 11'6% were found positive to malaria.

Some of the negative slides might have been clinically malaria. Negative results were possibly due to the following factors.—



Graph 3. Showing the aggregate monthly total of different types of malaria for 10 years from (1924-33)

M.T. 0-0
B.T. x.x-x.x
Q.T. x-x

1. Previous administration of quinine
2. Improper and poor films.
3. Improper staining.
4. Insufficient search.

A paper read in the annual general meeting of the Assam branch of the I. P. M. S. A. in 1931 by Dr. P. N. Mitra, M. B., D. T. M., and published in the *Indian Journal of Medicine Vol. XII part iv, Aug. 1931*, gives statistics of incidence of malaria based on examination of 1923 blood films from 1924-30 inclusive, with the exception of the year 1929.

This paper shows quarterly incidence of

malaria and Dr. Mitra's findings tally with ours also.

Thanks are due to Lt. Col. J. L. Sen, M.C., I.M.S. Superintendent, B. W. Medical School, Dibrugarh, Assam and Dr. R. M. Deb, M.B. Pathologist, B.W.M. School, for their kind permission to compile the figures from the records of the pathological laboratory attached to the B.W.M. School, Dibrugarh, Assam.

I am also indebted to my revered teacher Dr. N. N. Ghosh, teacher of medicine, B.W.M. School, Dibrugarh, for kindly going through this paper.

Clinical Memoranda

BACTERIOPHAGE IN CHOLERA

By AMRITA NATH ROY, B.A., L.M.F.

20, Suri Lane Back, Calcutta

When I worked on behalf of The Bihar Central Relief Committee in the villages of the district of Monghyr I had the opportunity of treating a few cases of Cholera with Cholera-Bacteriophage. My previous experience with this method of treatment in the Campbell Hospital, Calcutta, led me to try the same here. The result I obtained was *not unsatisfactory*, as the following illustrative cases would show.

I believe that the primary treatment of an advanced case of cholera should be to combat dehydration and secondly to eliminate the toxins and the lytic products produced by Cholera Vibrios. But the early cases do not show marked fluid loss and may therefore be safely treated with the specific bacteriophage.

The number of cases treated by me is small and I venture to report the same with a view to induce other workers from different fields to report their observations on the results of bacteriophage treatment of cholera. If those results are favourable the treatment of cholera will be much simplified and shortened.

Case 1.—Palah, M.M. aged 42, Native of Baldaur in Monghyr district went to Jamalpur on 19-9-34 where cholera was prevalent in epidemic form. He returned to his native place on the evening of 20-9-34 and started purging and vomiting at about midnight of the same day. I was called to see him early next morning and found him in a prostrated condition, his pulse thready, eyes sunken, tongue dry, fingers shrivelled and heart sounds faintly audible. He had severe cramps in the legs and was very thirsty. Specific gravity of blood and blood pressure could not be taken owing to the want of necessary apparatus. The case was clinically diagnosed as cholera. He was given saline immediately. Two "soloids" of sodium chloride (Burroughs Wellcome & Co.), each containing 40 grains, were dissolved in a pint of distilled water boiled to 100°C. to make an isotonic saline for subcutaneous injection. The saline was cooled to body temperature and given under the skin below the axilla. At the same

time a hypertonic saline solution made by dissolving 4 tabloids of calcium chloride compound (B. W. & Co.) in a pint of distilled water was given intravenously. Cholera Bacteriophage (B. I.) in 2 c. c. ampoules dissolved in an ounce of cold water containing 10 grains of soda-bicarb was given by mouth every two hours. The patient came round without requiring any further injection of saline, though purging in a lesser degree continued till next day. No other medicine was given to this patient during the course of this treatment. In this case 2 pints of saline made good the loss of body fluid and 10 ampoules of Bacteriophage perhaps helped to bring about lysis of the Cholera Vibrios. The patient was put on barley water only during treatment.

Case 2.—Ramdhari, H. M. aged 40, Native of Maina, six miles from Beldaur Bazar, started purging on the morning of 25-9-34. I was called to see him at 2 p. m. He passed "Rice water" stool, his pulse was rapid and feeble, had air hunger, but cramps less marked. The loss of body fluid was not much and therefore there was no necessity for saline infusion; I put him on Bacteriophage only at two hourly intervals. The patient recovered after two days' treatment.

Case 3.—A Hindu boy aged about 8, living in the same house as that of Case 2 was also attacked with cholera. He was given the same treatment as above and he recovered.

Two more cases in other villages were also treated with Bacteriophage with good results. They were not typical cases of cholera but might have been early cases of choleraic diarrhoea.

Remarks.—(1) In villages cholera can only be diagnosed symptomatically. Dehydration may be considered as a characteristic symptom of cholera, as in no other intestinal disease the loss of fluid is so marked, except perhaps in acute bacillary dysentery. The only method of combating dehydration is by saline infusion.

(2) Bacteriophage is specific for the particular bacteria from which it is prepared. In cases which are not cholera, Cholera Bacteriophage cannot produce any result.

(3) The curative and prophylactic treatment of cholera with Cholera Bacteriophage requires a more extensive trial.

A CASE OF APHASIA

BY DR. DEBENDRA NATH BANERJEE,

B.A., L.M.F.

P. O. and Village. Pantihal, District Howrah

I was called in to see a case of Aphasia of two days' duration. The patient was about 60 years of age and was addicted to toddy drinking. On the day of occurrence he took liquor at noon and at 4 o'clock he found himself suddenly unable to speak in spite of several attempts. He could however swallow liquid or solid food without any difficulty. Bowels moved regularly and urine passed normally.

I examined the case thoroughly. There was no history of fall or injury on head; nor was the blood pressure marked. When I examined the throat I was astonished to find the *uvula* totally obliterated. A chronic pharyngitis was present for which the patient had no treatment. *There was no previous history of aphasia.* Guessing that the aphasia might be due to the spasmodic contraction of the *uvula*, I pressed the tongue with a spatula and asked the patient to speak. Whenever he tried I noticed that the *uvula* protruded a little. After several efforts, he was able to produce a little vocal sound. I cleansed the throat with a swab and asked him to rest a little. I tried the same procedure once or twice and he was finally able to talk normally. The *uvula* regained its normal size.

This is no doubt a rare case and it is quite possible that the spasmodic contraction of *uvula* may have produced a temporary aphasia.

A CASE OF GLUTEAL ABSCESS CAUSED BY A FOREIGN BODY (A SWAB STICK OF 1½ INCHES LONG) PASSING THROUGH THE ISCHIO-RECTAL FOSSA

BY DR. M. M. HAZRA

Chief Medical Officer, Jashpur State, E.S.A.

Mohan Ram, a police sepoy, aged about 35 years was admitted into the hospital on 30-7-30, for the treatment of fever of three months' duration. No Malarial parasite was found and his blood pressure, systolic, was 120. He was put on expectant treatment for a week. One day when I was standing by his bed, I smelt a fetid odour. I thoroughly examined him and to my surprise found a big gluteal abscess on his right buttock. He was hiding it all along in fear that he will be operated.

The abscess was opened, drained and scraped a little and during this process was recovered a piece of swab stick 1½ inches long from within the necrosed tissues.

How did this stick enter the right gluteus muscle? There was no previous history of a fall or injury over that site. He was accustomed to take his meals on the leaves of *sal* tree, being stitched together with sticks of the kind as removed from the abscess. There is sufficient reason to suggest that the stick might have been swallowed by him without his knowledge while taking his food from the *sal* leaves and that this stick, passing through stomach and intestines, might have entered the Ischio-rectal fossa by piercing the rectal mucus membrane. In no other way can the similarity between the stick removed from the abscess and the one used to stitch *sal* leaves be explained satisfactorily. My presumption that he might have swallowed the stick while eating and that it had entered the Ischio-rectal fossa after piercing the rectal mucus membrane inside, is therefore, quite tenable.

Practical Suggestions and Reminders

(Continued from the previous issue)

13. *Negative and positive phase.*—These terms are ill-understood. Negative phase may be defined as initial lowering of the opsonic index following the injections of vaccine or bacteria and is an expression of a period of hyper-susceptibility to infection. Positive phase follows the negative phase when there is a rise in the opsonic index and the anti-bodies are formed effectively. Opsonins are substances in immune sera or vaccine which so act on the bacteria that phagocytosis is made possible.

The determination of the extent of this phagocytic phenomenon is termed the opsonic index. Thus, in counting 100 cells, if we find 500 phagocytised cocci in the patient's blood which gives an average of 5 ($\frac{500}{100}$) and in the normal individual blood if we get 1000, an average of 10 ($\frac{1000}{100}$) the opsonic index would be $\frac{1}{2}$ or $\frac{1}{5}$. Wright was the first to point out the dangers of the negative phase in the therapeutic application of vaccine in the year 1901 and his subsequent contribution to the subject has dispelled some of the fears which he himself raised in his

earlier work. He concluded that the extent and duration of the negative phase—i.e., of diminished bactericidal power—correspond to a phase of diminished resistance and that these may be augmented by a heavy initial dose of the vaccine. In other words it should be small and should not produce severe constitutional reaction. The possible dangers of a negative phase in prophylactic inoculations for cholera, plague, small-pox and typhoid—especially during the period of epidemics—that they may increase the susceptibility to infection are rather over-estimated and are probably negligible. The success that attends prophylactic inoculations in this country gives a direct lie to this theory. On the contrary, in therapeutic vaccine, as the negative phase may give a set back to progress it would be wise on our part to minimise its extent and duration by a guarded initial dose. Clinical experience can bear out the futility and dangers of a heavy initial dose. This is probably one of the reasons why vaccine therapy has fallen into an undeserved repute, as a result of our injudicious use of it in improper time and doses.

14. *Urinary Antiseptics.*—Many antiseptics—proprietary and pharmaceutical—for use in urethral lavage are in vogue. Each physician has got his own favourite drug: Argyrol, Protargol, Acriflavin, Mercurochrome, Targisin, Boracic acid, Silver nitrate, or Hydrargyri per chloride, etc. But none of these have established a better and more enduring reputation than zinc permanganate or potassium permanganate. If this drug is to give the best effect it ought to be used as a very dilute solution (1 in 10,000) when the urethral lavage is commenced and brought up to the strength of 1 in 500 gradually. Strong solution sets up urethral irritation, increases the already existing inflammation and paves the way for posterior infection and septic cystitis.

15. *Pathogenic Bacteria in the Faeces.*

- (1) Typhoid and Para—Typhoid group: Their presence in the faeces even after convalescence gives rise to the "carrier state." Diagnosis of this group of disease is not usually made by the examination of the faeces but by blood culture and Widal's test
- (2) Bacilli of Flexner and Shiga: They are found only in acute cases, very rarely in chronic cases. They are found in the mucus portion of the stools.
- (3) Para-dysenteric bacillus, such as Morgan's No. 1., the causative agent of summer diarrhoea in children;

Bacillus Enteritidis of Gærtner in cases of food poisoning.

- (4) Tubercle Bacilli may be found in the faeces, especially in intestinal tuberculosis. In infantile phthisis it is found in the faeces as the children usually swallow the sputum. As a rule we find T. B. in faeces only in well-advanced cases of Tuberculosis. Otherwise, its finding must be confirmed by guinea-pig inoculation.
- (5) Presence of staphylococci in the faeces means in many cases local infection of rectum and anus, such as fistula-in-ano. Staphylococci are not normal inhabitants of the intestines.
- (6) Streptococci are normal inhabitants of the intestinal flora and there are several varieties which may become pathogenic. There are two types: the Hæmolytic and the Non-Hæmolytic. The Hæmolytic streptococci may produce severe constitutional symptoms if they enter the general circulation. The non-hæmolytic, of which enterococcus is the best example, may become pathogenic at times and produce mild degree of fever, colitis, etc., and at times gives rise to diagnostic confusion.
- (7) Cholera Vibrios are found in the faeces only when they invade the intestinal mucosa and when, as a result of such an invasion, they give rise to typical "rice-water" stools. They can be isolated from the "rice-grain" particles floating in the watery evacuation. This type soon changes into a non-agglutinating and non-virulent ones, perhaps non-pathogenic also. It is this type which we find during convalescence. Both the types do not persist long in the stools. The agglutinating type is soon converted into the non-agglutinating one. Even these non-agglutinating vibrios do not persist long in the stools for more than a fortnight after convalescence. Hence there are no "Cholera-carriers" in the sense we understand the "typhoid carrier." The reversibility of non-agglutinating vibrio into the agglutinating is not yet established conclusively. Prof. D'Herelle believes that this reversibility never occurs. Others, however, differ from him.

A. V.

(To be Continued)

Indian Medical Journal

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AUGUST 1935

BERI-BERI GROUP OF DISEASES III

CLINICAL AND EPIDEMIOLOGICAL OBSERVATIONS

Let us dismiss briefly the dry type of beri-beri with polyneuritis and paralysis, cardiac and muscular atrophy due to complete absence of vitamin B in the food and to chronic poverty of other proximate principles. The incidence of such a type in endemic areas of beri-beri in India forms a small percentage, probably because such a total deprivation is not a regular feature in the dietaries of even the poorer population.

It is the wet (dropsy) type of beri-beri which is more common, at least in this country, than the former, as a result of insufficiency of vitamin B; and it is so because the normal diet of poor folks is not completely devoid of vitamins and other food principles. Let us assume hypothetically that epidemic dropsy is a clinical variant of the wet type with certain peculiar and uncommon features and probably with a superimposed specific infection. There are certain endemic areas of beri-beri in India and it is mostly in these areas that epidemic dropsy also occurs, though there are a few epidemics chronicled where epidemic dropsy is said to have been introduced by a human carrier. Wet beri-beri is not usually explosive, takes some months to develop and occurs sporadically throughout the year. Epidemic dropsy is usually explosive and occurs in seasons when there is heavy rainfall, high relative humidity and spells of storms. It is acknowledged by all workers that rice is a common aetiological factor in both, but with this difference in interpretation: namely, one set of workers, chiefly MacCarrison, assert that the intoxication is due to the vitamin insufficiency, another set of workers, chiefly Acton, Chopra and Megaw, believe that though vitamin insufficiency may play a part, yet there are clear evidences of external infection of rice which produce the toxæmia. There is yet another

common factor between both: they tend to occur in families, institutions, and in specified areas in a certain place.

Besides, the age-incidence also is practically the same in both—infantile dropsy or infantile beri-beri being very uncommon. Apart from the fact that epidemic dropsy is often explosive, the symptoms in both are practically identical, the difference being in the variations of the degree of severity rather than difference in types. Thus, fever, gastro-intestinal disturbances, œdema, loss of knee jerks, tenderness of calf muscles, patchy erythema of extremities, tendency to hæmorrhage, palpitation, dyspnoea, cardio-vascular changes with hypertrophy, dilatation and fatty degeneration are common to both, as much as variations in these symptoms. Neither do the features of morbid anatomy differ very much. Dilatation or hypertrophy of the heart with or without pericardial effusion; hyperæmic enlargement of liver and spleen, hyperæmia, ecchymosis and catarrh of stomach, duodenum and intestines: œdema of the lungs and even serous pleural effusions; congestion of the kidneys; ascites; hypertrophy of the adrenals; atrophy and œdema of muscles; hyperæmia of the meninges and the cord—all these are alike in beri-beri and epidemic dropsy.

Writes Megaw: "we have not yet found any clinician or research worker who has been able to supply a criterion by which the average case of moist beri-beri can be distinguished from a typical case of epidemic dropsy; it is pretty certain that a case which would be called moist beri-beri in the far east would be called epidemic dropsy in Calcutta and vice-versa."

Regarding these findings there are no differences of opinion between the school of thought of which MacCarrison is the chief exponent and that of the Calcutta School of Tropical Medicine, of which Acton and Chopra are the chief observers. The difference arises in the interpretation of these facts and findings. We have already mentioned the factors common to both these types, namely; rice, seasonal incid-

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BERI-BERI GROUP OF DISEASES

409

Analysis of a few Reports of Epidemic Dropsy for the years 1927 to 1931 :—

Name of the Investigator	Place of Occurrence	Article Suspected	Remarks.
1. Anderson (1927)	Kulna (Non-endemic)	Contact	(1) Epidemic localised. (2) No previous epidemic in that area. (3) Followed immediately on the arrival of people suffering from epidemic dropsy (4) Evidence of person to person infection.
2. Banerji (1927)	Allahabad (Non-endemic)	Partly rice and partly mustard oil.	(1) Only the Bengalee residents were affected. Cases occurred in every quarter of the town wherever the Bengalees resided. (2) Previous to the epidemic, rice was imported from Calcutta by a Bengalee merchant. (3) Some Mahomedans who used the same rice were not affected. (4) Probably a "Toxin-infection".
3. Megaw, Battachari, and Paul (1927)	Howrah.	Mustard oil	Accidental poisoning by contaminated mustard oil.
4. Do. (1927)	Entally (Endemic)	Rice and mustard oil from a common store	Houses investigated were 50. Total population 332. 297 attacked. Exceptionally high incidence in young children.
5. A. V. Kamath (1928)	Ganjam (Endemic)	Infection of food in a majority of cases; Contact in a few cases.	(1) No doubt of being infective. (2) There were 2 centres of infection where the disease spread around. (Infection to rice was not traced).
6. K. G. Banerji	Birbhum (Endemic)	Mustard oil	(1) Particular consignment of mustard oil was responsible. (2) Being explosive, not likely to be due solely to vitamin B deficiency. (3) Rice infection also is not tenable, because in every instance the rice used came from the family store and not from a common source.
7. Mahadevan and Raman (1930)	Guntur. (Endemic)	Infection of Rice	(1) Beri-beri present here before the introduction of rice mills. (2) Rice is not stored for long time. It occurs in coolies and poorer people who use under-milled rice which is not defective in vitamin B. (3) If it is due to endo-gastritis (MacCarrison), why should it be restricted to endemic area? Spirochæte as a probable causative factor, since 5 cases recovered with Salvarsan.
8. Sarkar (1931)	Sandwip Islands (Endemic)	Infected rice from Barisal	Compares it to the epidemic of 1927 when the local people were affected as a result of storing the local rice in gunny bags in which Barisal rice had been brought. At that time epidemic dropsy was raging in Barisal.

ence, geographical distribution, clinical and pathological findings. Where, then, arises all this bother whether epidemic dropsy can legitimately be classified under beri-beri? To realise this difficulty one has carefully to study how this epidemic arises and spreads. We have tabulated (see page 409) all such epidemics as are reported in the literature from the year 1927 to 1931, a perusal of which will show the following outstanding features.—

- (1) The epidemics are explosive, pointing to a quickly acting cause.
- (2) The disease seems to be communicable, but the means of communication, as a rule, seems to be rice, though mustard oil contamination also has been reported.
- (3) The disease seems to affect indiscriminately those whose diet is poor in vitamin B or otherwise.
- (4) There seems to be a common source of infection; that is to say, the people who buy their rice supply from a common store either imported infected rice or infected at the store itself as a result of exposure to dampness.
- (5) Bad weather conditions, such as heavy rains, storms and high relative humidity, seem to favour infection of rice.

As mentioned earlier, Acton and Chopra maintain that this bacterial infection with what they term "Rice bacillus" produces two kinds of toxins, water-soluble toxins and neurotoxins. The former is responsible for the dropsical symptoms and the latter for multiple neuritis, paralysis, etc. They claim to have isolated these organisms in a few cases: identical organisms both in the rice consumed and in the stools of those who consume such a rice. They also seem to suggest that variations in symptoms are due to the variations in the water-soluble toxins and neurotoxins, or to the action of the same organisms on different types or culture media, polished rice in one case and parboiled rice in another. We have already mentioned the view of MacCarrison and that of Gloster who strongly believe that since the experiments with feeds containing the suspected "Rice bacillus" do not produce the classic symptoms without the optimum insufficiency factor of vitamin, the question of external bacterial infection is unimportant in the aetiology of beri-beri. Gloster, on analysis of various samples of rice from both endemic and non-endemic regions in India and Burma, does not find bacterial contamination in anything like a large scale infection as to point

to it as a causal factor. It is not only rice that is found so contaminated but also wheat, flour, milk, water, oil, canned foods containing fruits, vegetables, meat and milk. One can, therefore, legitimately question why it is that infected rice is incriminated to the exclusion of other food stuffs which are also likely to be infected. Suppose one buys rice from a store where infection is suspected; there is an equal probability of his buying dhal and oil which may also get contaminated not directly from nature, but through the hands of the shopkeeper by his indiscriminate handling of materials. Then again, why should it be so preponderantly prevalent in beri-beri areas only, though the infection is not specially partial to rice? In the Punjab, where beri-beri is neither endemic nor sporadic, where the methods of storage of wheat are no whit better than storage of rice, equally susceptible to monsoon rains and winds and high humidity and, therefore, equally capable of being infected, beri-beri and epidemic dropsy are uncommon. It is said that since even those who take such diet which cannot be said to be defective in vitamins and proximate principles of food are affected, it is difficult to exclude the factor of a specific causation. Epidemic dropsy has been found to occur in those using parboiled, undermilled, home-pounded and not-long stored rice, and such an incidence seems strongly to revolt against the theory of vitamin B insufficiency and the resultant endogenous toxæmia, intrinsic to a condition of disordered metabolism. If the theory of MacCarrison is more probable, Mahadevan questions why it should be restricted to endemic areas. In the course of his observations at Guntur (1930) he particularly draws attention to the fact that "too much emphasis is laid on the fact that over-milled rice forms the main article of diet among the ordinary coolies; our experience is that it is under-milled rice," and that the disease is more rampant in those using under-milled rice than otherwise and that it is confined to endemic areas because the organism is lying dormant there, only to become active under favourable conditions of weather. This kind of argument arises, because of the assumption that under-milled or parboiled rice is not deficient in vitamin B and that even if deficient, is made up by the addition of dhal and vegetables rich in vitamin B; that therefore insufficiency cannot be the cause and the causative factor is elsewhere, as for example in some external infecting organism attacking rice and rejuvenated to a state of activity under favourable atmospheric conditions. If it is proved in those cases that there is absorption of vitamin

B in optimum quantities and still the disease breaks out, then it looks more reasonable to postulate the theory of external infection of rice. No such investigation has till now been made or recorded in the many reports that are appearing about epidemic dropsy in the current medical literature. If the infection is independent of vitamin and food values, why is the disease rare in the Punjab where these spore-bearing aerobic organisms are common or as uncommon as in certain portions of Bengal, Madras and United Provinces? If the infection is superadded to that of vitamin insufficiency factor, how is it that there is a close similarity of clinical and pathological manifestations between a case bacteriologically negative and a case bacteriologically positive? As regards endemicity of these organisms in the endemic areas of beri-beri, that may not be improbable. During the season of the alleged epidemic virulence of these organisms which largely coincide with the monsoon there is also a larger incidence of intestinal diseases due to various causes. Could not the intestinal catarrh reduce and limit the powers of intestinal absorption to such a degree in a large number of people—whose number may be greater than those suffering from epidemic dropsy if one attempts to record them—and thereby accentuate a progressive insufficiency of vitamin B absorption in a larger scale than what is common in non-monsoon seasons of the year? We are inclined to believe that MacCarrison's hypothesis is more in consonance with the recorded facts and observations than the theory of external bacterial contamination, plus the vitamin insufficiency propounded by the School of Tropical Medicine. The one thing that beats hard against MacCarrison's theory is that occasionally the disease spreads by contact, as in the epidemic related by Anderson (1927) and by Mahadevan (1930). Then, there is the factor of epidemicity, characteristic of epidemic dropsy as contrasted with the endemic nature of ordinary human beri-beri. Sometimes these epidemics are very virulent and dramatic in their spread and manifestations, as the Calcutta epidemic of 1926 which claimed a heavy mortality of 40 to 50 per cent. In connection with that epidemic Sir Nilratan Sircar observed that the bacterial infection view had not satisfied Koch's postulates, that no theories had yet reached the stage of proof and that "in future it might be found, some views are partly right, others partly wrong." B. C. Roy considered that a large number of *B. Coli* in the water-supply might produce this disease in conditions of avitami-

nosis. Basu maintained that epidemic dropsy had nothing to do with beri-beri, that diet had limited scope in treatment and that infection might belong to the typhoid group of organisms. On the contrary, the Health Officer was of opinion that stoppage of rice controlled the spread of the disease. Most of them employed vaccines of *B. Coli* and streptococci and electrargol injections with apparent benefit. Mahadevan tried with some success in two cases salvarsan and the favourable therapeutic result tempted him to suggest a spirochaetal infection. Somehow or other, we feel, that much capital should not be made of the therapeutic method in determining the causation of disease.

In spite of all these discordant notes and observations it looks more probable and is more largely in consonance with experimental, epidemiological and clinical findings, that beri-beri and epidemic dropsy are not aetiologically different entities and that the latter may be taken as an expression of an epidemic exacerbation of an endemic disease, brought about by a concatenation of predisposing causes at one given time such as severe monsoon, post-diarrhoeic diminution of intestinal functions, overcrowding, insanitation, and poverty, more acute in the rainy season than otherwise, than the theory of specific causation.

TUBERCULOSIS IN INDIA*

Tuberculosis is one of the chief causes of largest mortality in India. It is not merely that mortality causes us anxiety but the number of young adults who, on account of this infliction, lead invalid and disappointed lives is probably much greater than the mortality figures and is not less disconcerting than the percentage of mortality. As the report puts it:

"It is not only the annual toll of life that is appalling, but the long-drawn-out suffering of young adult patients, who number many times the actual total of deaths, that is the terrible tragedy! This untold misery in thousands of homes is preventible and unnecessary, though a just revenge of nature for our negligence and incompetency to tackle the tuberculosis problem in India."

The practical preventive measures suggested in the report are:

*The fourth annual report (1934) of the King George Thanks-giving (Anti-tuberculosis) fund.

(1) The removal of ignorance by educating the public as to the causes and preventive measures necessary to fight the disease.

(2) The betterment of conditions of living, town planning, better housing, sanitary improvements.

(3) The removal of certain social customs and vices.

(4) The provision of tuberculosis dispensaries for early diagnosis of cases. Where possible, sanatoria, hospitals, colonies, etc., should be established for the patients who cannot be treated properly in their own homes.

The report continues :

"The attitude of the people towards the disease, is the same as it was in France and England a few generations ago. But whereas as soon as the people of those countries understood the nature of the disease and circumstances under which it flourished and took prompt and thorough preventive measures, we on the other hand permit bad housing, overcrowding, insanitary conditions and the like not only to exist, but to grow !

Owing to the conspiracy of circumstances, India affords a favourable soil for the spread of this terrible disease. She is proverbially poor, at least for the last 3 or 4 centuries and she is getting poorer than ever before. As such, over crowding, insanitary conditions, starvation and other attendant ills of poverty devitalise the nation and make her subject to many preventable diseases—not to mention tuberculosis alone. Not only the chronic poverty of the people, but also the growing number of cities and factories of various kinds contribute their share in the increasing spread of this disease. Mere mention of the causes that make this disease flourish in its malignant fertility may satisfy our intellectual hunger, but does not solve the problem. If the labouring class demands higher wages to maintain a minimum standard of living, which is a reasonable guarantee against disease, the capitalist consults his balance sheet and finds it impossible to satisfy the demands of his labourers. Then comes the lock-out and ugly sequences. The office clerk bends his back during the greater part of the day and finds his monthly wages are not sufficient to keep his body and soul together. The agricultural labourer tills and tills but finds himself under-paid by his land-lord, who, honestly enough, cannot

pay higher wages, as he himself is subject to the subtle fluctuations of tariff, exchange and market. Thus the vicious circle is perpetuated.

We are not competent to deal with the cause and cure of the above mentioned conditions. But this much we can say medically that unless the standard of living is raised and the wolf that prowls about the poor man is given a good chase, the many preventable diseases, will, in spite of our best efforts, ever remain unprevented. All the educative propaganda illustrating to the people the evil nature of this disease is bound to be futile, till the average man is armed with the bare necessities of life—namely two good meals, a decent, well ventilated hut and some occupation which will fetch the above two.

As the report observes, the people of this country are now more conscious about the necessity of preventing this disease and the aim of The King George Thanks-giving (Anti-tuberculosis) Fund is to arouse public opinion and enthusiasm to fight tuberculosis. We wish this fund a real success, as it richly deserves to have and we are sure that every medical man will do his little bit in this humanitarian cause of The Fund.

In this connection we would like to draw our readers' attention to the rural reconstruction scheme of Mahatma Gandhi and we personally believe that if it is worked properly as outlined by him, it will be a solid preventive measure against many of the preventable diseases. The two salient features of his scheme are :

- (1) To raise the level of nutrition of the ordinary Indian diet, without extra cost.
- (2) to make the Villager engage himself in profitable rural home industries which can give him a decent livelihood.

There is no doubt that this practical scheme, if followed and practised, would solve the problem of prevention of Tuberculosis in India within a period of 30 years at the most. Tuberculosis clinics and colonies, Sanatoria and hospitals are all good in their own way and ought to be encouraged; but they do not strike at the root causes of the disease as the Scheme of Mahatma Gandhi.

Current Comments

"Minimum standard of medical education" is a phrase which we have very often heard in connection with the replies given to the medical licentiates when they claim equality of status in the Indian medical profession. We do not for a moment question the need of such a minimum but when vested interest tries to play the hoax that the licentiates do not get that minimum standard of medical education in the recognised medical schools of India, and when, on account of this, they are kept down, we have to protest against the official definition of the minimum standard.

The pre-requisite of "the minimum standard" is five years of medical curriculum. The rest is a question of detail. The irony of the situation is that most of the medical schools in India, except those in the Madras Province, have got only 4 years' course and it is therefore said that they all fall short of "the minimum standard".

The All India Medical Licentiates' Association has been clamouring for a five years' course since its very inception in 1906. Between 1906 and this year of grace, nothing tangible has yet been achieved in this direction, though the curriculum of medical studies has been sufficiently increased and can stand comparison with any other medical institutions in this country and elsewhere. The pre-requisite condition of 'the minimum standard' alone remains yet unfulfilled. That is a convenient brush with which to paint the medical licentiates with the colour they want to show us out.

But to be just, no provincial government has ever said that it is averse to five years' course but that the finances do not permit this enhancement of the course and that when better times come they will give due consideration to this question. Circumstantial evidences force us to swallow these statements, *Cum grano Salis*. For, we cannot believe, that a powerful British Indian government, with many costly financial ventures to its credit, even during these days of financial depression, cannot spare a moiety in furtherance of the scheme of 5 years' course. After all, it will cost each provincial government not more

than a lakh of rupees at a most generous calculation.

The anticipations of the leaders of the A. I. M. L. A. have proved too true. When some 20 years ago they wanted a five years' course, they were told "you are intended to be subordinates; the course you get is sufficient; why bother yourselves". In the next decade they were told "you are so clever; you are the 'nickle coin'; without you, the epidemics would have swallowed the whole population of India; when the State and the Public have given you such a recognition, why do you still cry aloud for a five years' course." In recent times, when no such shibboleths can carry conviction, they are told "you want a five years' course. That means more cost to the government. We get the medical graduates on the same terms as we have been getting you. If you want an increase in course, wait for better times." That is the brief history of the agitation for five years' course. All along the medical licentiates have been damned for the want of one years' extra course. The British Medical Council refuses to recognise these institutions; the provincial medical councils have got a special method of classification; the recently formed All-India Medical Council does not include these institutions within its purview—all, chiefly, for the want of one years' extra course. Thus the anticipations of the leaders of the A. I. M. L. A. have proved true, in spite of their precautionary demand of a five years' course for the last 20 years.

Let us now come to the question of minimum medical educational standard in so far as it applies to the details of medical education. This is fixed by the medical councils of each country. Without going into the question of the quality of the medical education itself, it cannot be said that the medical schools of India are run without the approval of the curricula, the efficiency of teaching and the sufficiency of equipment by the provincial medical councils. The fact that the diplomas granted to the medical licentiates are registrable shows that the provincial medical councils are satisfied with the minimum standard of medical education in the medical schools of this country.

And yet, these medical councils classify them separately. We are therefore justified in commenting that *Vested Interests* stand in the way of the reformation of these medical councils.

It may plausibly be said that the resolutions of the Medical councils, in so far at least as the educational standard and the period of training given in the medical schools are concerned have no binding effect on the government. *That is true enough.* But it is also true to say that, if, for a moment, the medical councils refuse recognition of the diplomas granted by the schools, the Government has either to put an end to the medical schools or improve them in the manner asked by the medical councils. The medical councils have been going on from time immemorial in the line of least resistance. They have never been bold enough to assert their rights and privileges. The consequences

have been disastrous to the onward progress of medical education in this country.

We will end these cursory comments by appealing to the medical councils *to be up and doing.* We have offered these criticisms with much good will and honest intention. We have particularly refrained from making destructive criticisms. If what we have said awakens in them a sense of fair play and the urge to do better, we will feel we have not written these words in vain. It is high time that at least the divisions in the medical register are scored out at a very early date. *These divisions are unpopular.*

Notes and News

Berry White Medical School

Following is a list of candidates who are declared to have passed the final examination for the *Licence of the Board* held in April 1935 from Berry White Medical School, Dibrugarh, Assam.

1. Harendra Kumar Das, With Honours
2. Biresh Chandra Sircar, First Division
3. Puspadhar Sarma, "
4. Nripendra Mohan Ganguly, "
5. Nirod Behari Das, Second Division
6. Md. Sujjaduddin Ahmed, "
7. Md. Abdul Quader, "
8. Promode R. Sengupta, "
9. Bhupesh Ch. Dasgupta, "
10. Harendra Ch. Goswami, "
11. Naresh Ch. Bhattacharayya, "
12. Abdus Subhan Choudhury, "
13. Prabat Ch. Bhattacharrya, "
14. Kaumudikante Bhattacharrya, "
15. Narendra Nath Barooa, "
16. Harendra Nath Borpuzari, "
17. Mohini Kumar Chowki, "
18. Chandradhar Choudhury, "
19. Kr. Satendranarayan Deb, "
20. Karunakanta Datta, "
21. Muhibuddin Ahmd Hazerika, "
22. Sorindrao Mohan Roy Bonney Division
23. Sachindranath Sircar, "
24. Sibnath Senchua, "
25. Umesh Chandra Dhar, "

Dr. S. L. Sharma Honoured

Dr. S. A. Qureshi, President of the Fyzabad Branch of the A. I. M. L. A. while welcoming the

guest, Dr. S. L. Sharma, on behalf of the members of the branch, said, in the course of his speech :—

It gives me greatest pleasure to be able to welcome our real benefactor, Dr. S. L. Sharma, this evening. I believe he needs no introduction to you all. His services in the cause of Sub Asstt. Surgeons are too well known to you to need any recital. You all know the stupendous amount of work that he has put in as President of the All India Medical Licentiate's Association of the U.P. Branch and it is gratifying to know that he is in this city to organise the Branch here. I can confidently assure him on your behalf that whatever little we can do to help him in the cause we will do willingly and he can always confidently rely on our co-operation. His work as a Member of the U.P. State Medical Faculty is known to all of us. I thank him for all that he has done and for what he proposes to do for us in future. In spite of the fact that he is suffering from gout his activities are manifold and humanitarian.

We wish him all success in his labours and a long life of usefulness.

The Chettinad Medical Association

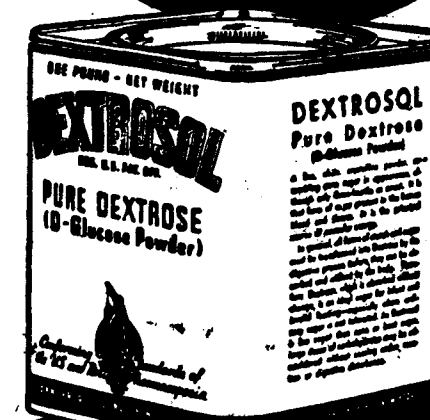
At a clinical meeting of the above Association held during the month of July, 1935 under the presidency of Dr. Mangalam Pillai, Dr. T. S. Shetty gave three interesting case reports—two of Diphtheria and one of cerebellar abscess in a case of neglected mastoid infection. One case of diphtheria was in a child 8 years old, coming from Madura and the other was in an adult of 85 years hailing from Ramnad. He said that it was curious that both the cases should come to him on the same day for treatment and enquired whether such cases occur in the practice of those present at the meeting. Dr. F. Y. Sanders, M. D. said that cases of Diphtheria are not uncommon. Discussing the relative advantages of Tracheotomy

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essential to
its antitoxin
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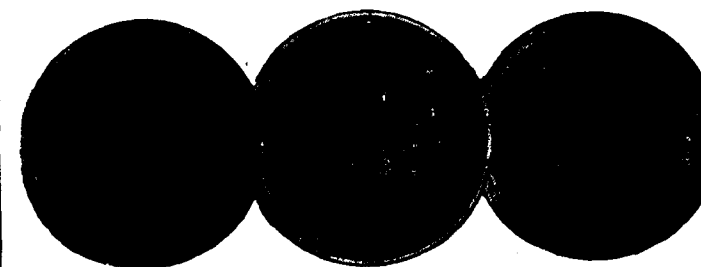
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and Intubation in advanced cases of breathing trouble Dr. F. Y. Sanders suggested that Intubation is a better method and easily done but that hospitalisation is essential lest the tube be coughed out. He also demonstrated some interesting X-ray films of the gastro-intestinal tract. Dr. D. O. Sendel, M.B., M.R.C.S. delivered an interesting lecture on "Record Keeping."

Dental Profession in India

"Dental Profession as it is practised in India" was the subject of keen discussion that arose among the Medical men of Madras, that gathered at a Clinical Meeting held under the auspices of the Madras Branch, A.I.M.L.A. on Wednesday the 10th July at No. 10, Thambu Chetty Street.

Dr. S. R. Bhat, M.B., B.S., L.D.Sc., was the Lecturer and Major G. R. MacRobert I.M.S., presided.

The Lecturer in the course of his speech pointed out that out of 5,000 men practising dentistry in India, 90% are unqualified and the consequences to the public due to improper handling of dental cases are untold and unimaginable. The so-called dentists from China and Japan and others without any preliminary qualification whatsoever are treating dental cases in Madras in places open to all sorts of infection unmindful of the principle of aseptic surgery. While tracing the history, the progress and the high standard of efficiency of dental surgery in America and the Continent, the learned lecturer stressed on the necessity of legislation to prevent unqualified hands practising dentistry in India. He also pointed out the comments in The British Medical Journal which brought to the notice of the Government of India

the need for well organised dental institutions to train qualified medical dentists in order to eradicate the evils of quack surgery in India.

The President while concurring with the views expressed by several of the speakers such as, that only qualified medical men should practise dentistry with special qualification and that they should do propaganda among the ignorant masses against the dangers of quack surgery, laid stress on the necessity for more qualified dentists to meet the demands of the people. He opined from his experience in Burma where also there are very few qualified dental surgeons, that medical organisations in India should do the needful to combat this great problem of quack dentistry in India.

Dr. Ram Singh Saxena of Aligarh writes under date 22-7-35.

"Dr. S. L. Sharma F. S. M. F. (Hon.) and Dr. (Miss) Ganga Bai Sharma M.O. I/C Dufferin Hospital Mussoorie have been elected as the members of the Governing body of the U.P. State Medical Faculty by the U.P. Branch of All-India Medical Licentiate's Association. I congratulate them on their success and hope they will try their level best to improve the standard of the education imparted at the Agra Medical School."

We draw the attention of our readers to the notice in our NOTICE COLUMN announcing the award of a gold medal for the best essay on "A practical scheme for rural reconstruction with special reference to matters pertaining to public health." The essay is to be written in Hindi.

Special Article

SUB-ACUTE INFECTIONS OF THE HIP AND KNEE JOINTS*

By DR. N. S. NARASIMHAM, L.M.P. (Mad.)
M.R.C.S., L.R.C.P., F.R.C.S. (I).

Tutor in Operative Surgery, Medical College,
Madras

Cases are not described under this heading in books. I have purposely named them as such, by which the very acute emergencies as acute arthritis

and the neglected chronic types are excluded from consideration.

"I am not speaking of cases of advanced disease about the joint nor cases of dislocation from disease. These symptoms are indicative of hip joint disease are not the early symptoms. When we see such symptoms we may be sure that the disease has made considerable progress. It seems to me therefore that we should search for the local symptoms which precede the period referred to; for, when the symptoms stand out so prominently and distinctly as to be recognisable by anybody, the local mischief must be great and there can be but little professional credit in

* Published by the permission of the author: being a lecture delivered under the auspices of the Madras University Extension Board on 25-1-35.

making out the cause of the symptoms. It is highly important that the surgeon should recognise the diseased condition of the joint previous to that period; for, that is the time when the most beneficial effects will follow a steady and long pursued plan of treatment by rest." So said John Hilton in 1860. The above is as true to-day as when John Hilton wrote it.

The all-important point is the early recognition of the first deviation from a healthy state.

Articular cartilage is hyaline, is 3 mm. in thickness, is smooth, hard and highly polished; cartilage grows from its cells on the deeper aspect; surface layers continuously undergo arthritis. The degenerated cells and matrix may be liquefied and take part in the formation of synovial fluid.

Nutrition of cartilage: In the bone deep to the cartilage there is a rich plexus of blood vessels and it seems likely that this forms the chief source of nourishment which reaches the cartilage by a process of imbibition. Since the blood supply is most copious near the margins of the cartilage, this part when irritated frequently proliferates, e.g., in osteo-arthritis, whereas the central part of the cartilage is less adequately nourished and is more liable to degeneration. If a small fragment of cartilage is set free in a joint, it may live and actually grow. In health the synovial fluid has a very low protein content, its nutritive value is very small.

Repair in a cartilage is a very slow process; cartilage cells have very little proliferative power. A wound of the cartilage is always repaired by fibrous tissue and for this reason may lead to serious interference with joint function and often to fibrous ankylosis.

Synovial membrane is a highly specialised structure, secretes synovia, has end bulbs and subserves a most useful protective mechanism.

Hip Joint

The head of the femur is an epiphysis having a separate circulation and joined to the neck of the femur by temporary cartilage. This might necrose completely.

Pain. The muscles that surround the hip joint perform their functions in groups and each group has a trunk nerve of its own and each nerve contributes a branch to the hip joint itself. A branch of the anterior crural nerve passes to the hip joint and a branch of the obturator goes to the capsular ligament and to the ligamentum teres. A branch proceeds to the posterior aspect of the hip joint from the sacral plexus which supplies the gemelli, quadratus femoris and the obturator internus. This nerve distribution is necessary as very often the patient complains of

pain within the knee or in the inner side of the knee joint. The obturator nerve which contributes a branch to the ligamentum teres sends a branch to the interior of the knee joint, to the inner side of it and sometimes even lower down. The frequency of this knee pain, whether within the knee joint or on its inner side, indicates that the ligamentum teres is the most common seat of early disease. The same pain may be complained of by old people with slight injury to the hip; in them the ligamentum teres softens down and disappears. If the anterior part of the capsular ligament (which receives a branch from the anterior crural) is inflamed, the patient with a diseased hip joint may have pain on the front of the knee or on the inner side of the ankle, because the anterior crural nerve sends branches to the particular spots. If the inflammation or injury begins at the posterior part of the capsular ligament which receives a branch or branches from the sacral plexus then the patient may have pain at the heel or in the foot.

Local Heat. The hip joint lies very deeply and therefore one of the earliest symptoms of an inflammatory condition—a sense of heat in the part—is not likely to be recognised early in the disease except by careful manipulation. The importance of local heat as an early symptom of inflammation was brought to notice by Sir J. Paget and Howard Marsh. Local increase of temperature is usual in the evening and after walking exercise. But by a few hours rest in the night, it may disappear in the morning.

Systematic examination of the Hip joint.—Gently grasp above the knee and roll the limb in all directions.

(2) Note any limp or lameness in walking.

(3) Ascertain if there is difference in local heat: compare both sides.

(4) Flexion at hip. When a joint is inflamed the movable part of it is obedient to the more powerful muscular action. Do the Thomas' test.

(5) Look for pain on pressure over or upon the trochanter major.

(6) Pain on pressure upon the front of the hip joint and nerve pain in and near the hip joint when the foot is struck upon its sole may be present.

(7) Watch for any slight degree of febrile excitement during night, a little restlessness at night, with occasional startling of the limb, the suspected limb being more flexed and more adducted during sleep (an almost constant occurrence).

Differential Diagnosis of early hip joint conditions:—(1) Knee joint disease. (2) Sacro-iliac joint disease. (3) Neuromimetic. (4) Spinal disease. (5) Fixation of hip joint by psoas spasm or from fixation

of spasm due to arthritis. (6) Transient arthritis of the hip is the most difficult differential diagnosis of tubercular arthritis of the hip in childhood.

Transitory Arthritis of Hip joint in Childhood: We have had several cases of transitory arthritis in our wards, two cases of which have been followed by me for several years. All the patients were admitted and observed; of 25 cases, 8 were definitely tuberculous, 1 sub-acute pyogenic arthritis, 1 pseudo-coxalgia, 1 chondroma of acetabular roof and 19 finally settling with a return of normal function, i.e., some form of transitory arthritis. I think it is the inclusion of these cases that makes the prognosis so helpful and is so much at variance with the results obtained by others. These cases were followed up for 8 years. One case proved to be congenital syphilis, 2 were hysterical (thought by some to be encephalitis lethargica). All the children had limitation of movement at the hip joint by spasm and a limp; seven had pain in the hip, six had pyrexia, the average time during which muscular spasm persisted varied from 6 weeks to 11 months. There is no x-ray abnormality. There has been some wasting of the muscles.

What was the cause?

(1) (a) Trauma (as traumatic synovitis)

(b) Traumatic osteo-chondritis.

(2) (a) Low grade infection entering the blood stream and localizing primarily in some part of the joint.

(b) Metastatic infection from some other focus.

Any primary infection must have been a low grade one as no destruction took place and recovery was complete.

Distinguish transitory arthritis from pseudo-coxalgia by X-Ray and clinical examination—early tuberculous arthritis of the hip observed for the last 10 years by the same author showed some bone atrophy about the affected joint, most of them with loss of joint space as well, and many with bone destruction already progressing.

Compare both hip joints. Do not put the patient to bed and rest till diagnosis is settled as some rarefaction of bone will be noted if the patient rests.

Knee Joint Conditions

A chronically inflamed knee may exhibit five essentially different conditions each one of which has its own problem of diagnosis:—

(1) Joint crepitus. Creaking is present in chronic articular rheumatism and not in tubercle.

(2) Chronic articular effusion—Effusion may be due to;

(a) Acute rheumatism.

(b) Congenital syphilis. Wassermann test of blood and of effusion is required.

(c) Haemorrhagic effusion, often intermittent.

(d) Chronic traumatic effusion. Has no evident thickening of capsule and this constitutes the distinction from tubercle supervening after an injury.

(e) T. B. and dislocation of semilunar cartilages.

(f) Gonorrhoea.

(g) Proximity of focus of osteo-myelitis.

(h) Tertiary syphilis.

(i) Neuropathic joint.

(j) New growths of synovial membrane and

(k) Chronic hypertrophic papillary synovitis.

(3) Thickening of the capsule including the synovial membrane and fibrous capsule.

(4) Rigidity of the joint.

(5) Bony changes.

Local heat: Effusions due to gonorrhoea, osteo-myelitis and recent injury show some local elevation of temperature but this vanishes much more rapidly than in tubercle where the same amount of heat can be detected for many months at each examination.

Early limitation of movement and the excursion of the knee may be absent even in tubercular synovitis of many years standing so long as the joint is not overdistended by the effusion. In such cases muscular atrophy does not supervene so soon as it does in tubercle with early ankylosis.

"Every mono-articular chronic serous inflammation of the knee, wherein there is definite thickening of the reflected folds of the capsule and wherein there is a persistent definite local elevation of temperature must be regarded as tubercular, even if mobility still remains and pronounced muscular atrophy is absent. Nothing but any clear evidence to the contrary warrants us in departing from this rule of diagnosis." (De Quervain.)

Foreign bodies moving in a small circle may be felt in polypoid form of tubercular knee. The polypi consist of hard connective tissue more or less abundantly permeated by tubercles.

The various forms of tuberculous disease of the knee are:

A. Serous inflammation: Synovial membrane slightly thickened, invaded by tubercles; serous effusion is present.

B. Polypoid inflammation: Synovial membrane has large fibrous polypi with tubercles.

C. Fungating inflammation: Slight exudation much thickening of synovial membrane:

- D. Fungating and caseating inflammation; Caseous thickening of fungating masses.
- E. The same as D but cartilage removed and destroyed by tubercular proliferation.
- F. Primary disease of bone in the form of a wedge-shaped area with sequestrum.

The four signs of impaired mobility in joints are :

- (1) Rigidity—Fixation of joint by involuntary contraction of muscle, a sign of disease in deep seated joints.
- (2) Contracture: Fixation due to permanent contraction of soft parts around a joint—muscles, tendons, ligaments, fascia, skin.
- (3) Ankylosis results from changes involving articular surfaces—fibrous, cartilaginous and bony. The occurrence of ankylosis in a joint before the skeleton has attained maturity does not appear to impair the growth in the length of the bones affected. When there is arrest of growth accompanying ankylosis it usually depends on changes in the ossifying junctions caused by the original disease.

If the capsule is greatly thickened in a diffuse manner the case is tubercle or a rare condition of gummatous arthritis, whether there be effusion present or not.

Localised fungating degeneration of capsule is to be distinguished from sarcoma of the articular capsule if the joint is movable. The bony lesion is often secondary as shown by the existence of numerous similar foci on the articular surface of bone especially where the capsule is reflected. We should only assume that the disease in the bone is primary if an extra-articular lesion is clinically demonstrable in a case where the joint is but slightly affected or if the skiagram reveals a large localised lesion. Cases which we think clinically have serous effusion and thickening of capsule, are found on exploration, to be lipoma arborescens, neither effusion nor thickening being present.

This may be of the dry or hydropic form. The dry form is usually polyarticular, of low virulence; peri-articular fibrosis usually occurs, and fibrous ankylosis occurs in the small and large joints. The hydropic form usually affects the knees, movements of the joints are relatively painless and comparatively unrestricted.

All chronic affections of joints for which no cause is known fall under two groups :

- (1) Rheumatoid arthritis (Synovial or proliferative type—chronic infective arthritis.)
- (2) Osteo-arthritis. (Chondro-osseous or degenerative type.)

Clinical types of gonorrhoeal infection are :

- (1) An acute synovitis with peri-articular phlegmon may end in fibrous ankylosis.
- (2) Suppurative arthritis ending in bony ankylosis.
- (3) Acute polyarthritis.
- (4) Chronic synovitis or hydrops. Often the knee joint is affected. There are no reactive changes in the synovial membrane, cellular tissue or skin; nor is there any fever or disturbance of health. The movements are free except in so far they are restricted by the amount of fluid in the joint.
- (5) Subacute arthritis with peri-articular changes. The peri-articular tissues become thickened, the cartilage becomes eroded and adhesions lead to deformity. Muscular atrophy is a marked feature of all chronic types.

In gonorrhoea the peri-articular tissues and especially the tendon sheaths are involved. Movements must be instituted before organisation of plastic exudate occurs.

Arthroscopy is used for :

- (1) Diagnosis.—To see the joint, to get the material for the bacteriologist before deciding on years of treatment or serious operations. Fluid for smears, for cultures and for guinea-pigs, and synovial membrane for histological and bacteriological examination or in the absence of fluid, for transferring to the guinea-pig either by injection after masking up or perhaps intact as a graft.
- (2) In adults whenever the diagnosis is uncertain.
- (3) In children there is no hurry.
- (4) For the hip. (Smith-Peterson approach).
- (5) The pathologist wants all the tissue we can safely give him.

This is practised by me, and, of course, ought to be done in a theatre with care. We are satisfied that this is a safe diagnostic measure.

Treatment. Arthrodesis of hip, shoulder and knee are as a rule practised by me for tubercle in its various stages and for ankle, arthrodesis combined with astraglectomy.

Children.—Under efficient conservative treatment, they heal with good mobility too. But there is a great risk of relapse. Extra-articular arthrodesis in children too is indicated when at the end of the period in hospital, necessary for general treatment, X-ray shows a badly damaged joint.

In adults.—Is extra-articular arthrodesis enough or is excision also to be combined? It is better to combine excision because—

- (1) the extensive granulomatous tissue is removed,
- (2) the great trochanter is brought close to the ilium, (This shortens the span of any bridging graft which is therefore less likely to be absorbed), and
- (3) the strain of preventing movement between the femur and ilium is shortened between the raw surfaces of bone which result from excision.

If the disease is still active and the hip is already fixed in bad position, both correction of deformity and arthrodesis are necessary and one can stabilize by an arthrodesis and do an osteotomy later or begin by correcting the deformity either by osteotomy or excision and postpone the arthrodesis to a later stage.

"Grumbling disease".—The patient's disease has been fully arrested and the chief complaint is that there is persistent aching in the region of the hip. X-ray shows an unsound ankylosis, for the strains imposed through the long femoral lever have kept up persistent low grade inflammation. Relief can be afforded either by extra-articular arthrodesis or by pseudo-arthritis without excision of the joint.

When the hip is unsoundly fixed in bad position three methods are applicable.—

- (1) Distant pseudo-arthritis.
- (2) Osteotomy and extra-articular arthrodesis.
- (3) Excision and extra-articular arthrodesis.

Deformity with disease soundly healed: Never do an arthroplasty. When the hip is fixed the choice lies between osteotomy and distant pseudo-arthritis.

Intra-articular arthrodesis is probably never successful in producing bony union in the neighbourhood of active tubercle bacilli or in the years closely following active tuberculosis of the hip, for tuberculous toxins depress the osteoblasts in the neighbourhood and that depression apparently lasts some years.

Yet extra-articular arthrodesis by a single short wide graft (Hibbs' method) may be useful in uniting femur and ilium. It is noteworthy that in a series

of cases of hip fusion published by Hibbs, the average length of history of successful cases was more than nine years and that in the only two cases with less than a year's hip fusion, it failed.

Toxic and infective synovitis and chronic arthritis: This leads in many cases to a certain amount of painful limitation of movement due to intra and peri-articular adhesions. The symptoms are usually mistaken for some pyogenic disease. When such a joint is fixed it is physiologically placed at a great disadvantage to combat any smouldering infection that may be present in the circulation of not only blood but lymph and secretion and absorption of the synovial fluid depends upon regular movement. When complete rest is enjoined, the formation of synovial fluid is very markedly diminished and the amount of fresh blood bearing phagocytes and anti-bodies is reduced to a minimum. One of the main complaints in this disease is stiffness and discomfort of the joint after the night's rest or after sitting still for some time, but this disappears after exercise. Do not completely immobilise the joint in this type.

When to move a joint? Prevent a joint from becoming stiff and if stiffness has occurred try to indicate whether rest or movement is necessary. A joint stiffened by simple adhesions, whether intra or extra-articular, should be moved actively or passively or even forcibly if necessary. A joint stiffened by arthritis should be kept at rest until heat and pain have subsided, when movements of a special kind may be allowed. A joint whose movement is limited in all directions is or has been subject to arthritis, while a joint which is limited in certain directions only, movement being normal in other, is not arthritic. Definite localised pain is experienced when adhesions are put on stretch and the tenderness can be generally localised on pressure. It is more diffuse in arthritis. An adhesion is most painful when a joint is moved and least so when the joint surfaces are pressed together. In arthritis pain is more pronounced when pain is brought to bear on the bone surfaces. Temperature of an arthritic joint is increased over the whole articulation while adhesions may produce localised surface temperature; usually there is none. In arthritis the stiffness is progressive; in adhesions it is stationary or retrogressive.

Gonorrhoeal joints.—Passive hyperaemia will prevent adhesions. When the acute pain has subsided, passive and active movements of the limb should be encouraged with a view to prevent the formation of adhesions. Vaccines, protein-shock therapy, and local urethral treatment are always

done. In the Special Department of our hospital, encouragement of active movements is the rule.

Active movements are to be preferred to passive ones. Active movements being voluntary are sure to

be gentle, being limited by pain, while the muscle is truly exercised. If passive movement is adopted, it should be confined to one single movement in each direction once a day.

Correspondence

MEDICAL LICENTIATES AND THE CORPORATION OF MADRAS

To

THE EDITOR,

THE INDIAN MEDICAL JOURNAL

Sir,

One cannot fail to observe the most useful and hard work that is being turned out by the medical licentiates under Madras Corporation Service. They attend to the medical needs of the suffering public of the city with great care and perseverance. In addition to this work, other duties such as of cholera and vaccination are also being done by them regardless of the status and salary assigned to such duties.

How far the Corporation authorities have recognised the good work turned out by the medical licentiates under its service and how their pay and prospects are proportional to the nature of the work turned out are questions which one interested in the welfare of the medical licentiates would be eager to get answered.

As far as my information goes, I am led to believe that the pay and prospects of the medical licentiates under the corporation service are not at par with the qualifications they possess. The authorities seem to ignore the gulf of difference between the qualifications of a L.M.P. and a sanitary inspector.

Appointment of medical licentiates on cholera and vaccination work on a salary similar to, sometimes less than, that of a sanitary inspector has become a matter of routine in the Corporation.

In the matter of appointment of Medical Inspector of Schools, though there is nothing in the rules to prevent medical licentiates to hold such posts, practically others are being chosen except in places where lady medical licentiates are required.

To give the designation of a medical vaccinator to a L.M.P. is rather unknown and uncommon.

Facilities for post graduate study and study leave for higher qualifications, as it is in vogue in government service, seem to be unknown to the Corporation administration.

It may not be out of place if I were to point to the authorities concerned that one of the objects of the All-India Medical Licentiates' Association, which has been in existence for over a quarter of a century, is to uphold and promote the interests of medical licentiates. Hence, on behalf of the Madras Branch of the A.I.M.L.A., I, while bringing to the notice of the authorities concerned the foregoing points which go against the dignity of the profession to which the medical licentiates belong, earnestly hope that their status and service would be rightly appreciated by the authorities of the corporation and that proper steps would be taken to remedy their just grievances.

U. D. Gopal Rao,

22-7-35.

Secretary, A.I.M.L.A., Madras.

ASAFOETIDA IN EPIDEMIC DROPSY

To

THE EDITOR,

THE INDIAN MEDICAL JOURNAL

Sir,

I have read your editorial on Beri-Beri Group of Diseases with keen interest, particularly because these are much prevalent in these parts.

I have been using Asafoetida in some cases of epidemic dropsy with much success. It may be given in 4 grain doses, once a day after meals with little water; or it may be advantageously combined with "Ajawan" and "Soonth." Of course, the condition of the heart requires attention, for which digitalis or ephedrin has to be administered.

The Marwaris take plenty of Asafoetida and they rarely contract this disease. This struck me as something curious and led me to try Asafoetida in the case of my maid-servant who had developed epidemic dropsy in January 1935. She recovered completely.

It is very difficult to say how Asafoetida produces such good results in this disease. I believe it deserves a more extensive trial.

Benares,

22-7-35.

Bimal Chandra Sen

ELECTION TO THE U. P. MEDICAL COUNCIL

To

THE EDITOR,

THE INDIAN MEDICAL JOURNAL

Sir,

It is a matter of congratulation and pride to our class that, on the persuasion of friends and members of the U.P. Standing Committee which met at the Mohan Eye Hospital, Aligarh, Doctor T. C. Basu Chowdhary has very kindly withdrawn his candidature to the U.P. Medical Council, thus allowing Dr. Kunj Behari Lal Varma to be returned unopposed to fight the poison rules. This action on his part will be remembered with gratitude by the medical licentiates in whose cause he has made this sacrifice.

In order to appreciate this action on the part of Dr. Basu, it has been mutually agreed that Doctor Kunj Behari Lal Varma will retire from the council after fighting the poison rules and that every effort will be made to support the election of Dr. T. C. Basu Chowdhary to the medical council and it will be the duty of every one of us to see that he is returned unopposed as soon as the occasion arises.

S. L. Sharma,

27-6-35.

Kunj Behari Lal Varma.

Our Contemporaries

THE BLEEDING TENDENCY IN JAUNDICE

By A. C. IVY, M.D., PH.D., P. F. SHAPIRO, M.D., and P. MELNICK, M.D.

(Extracted from *Surgery, Gynecology and Obstetrics*, Vol. 60, No. 4, April 1935)

The surgical and medical risks of infections and other pathological processes in and about the liver are seriously augmented by the possibility of hepatic insufficiency. One of the most striking surgical features associated with these cases of liver damage is their tendency to bleed. According to the results obtained in several clinics, 50 per cent of all post-operative deaths in patients with jaundice or liver insufficiency are a result of Haemorrhage.

Determination of bleeding tendency.—The first objective was to devise a reliable clinical method that would disclose the latent haemorrhagic tendency in jaundiced patients. The great variability of bleeding tendency in jaundice is well-known. Patients with a normal Duke's bleeding time, normal coagulation time, and blood coagulating factors will frequently bleed abnormally, and patients with abnormal findings will frequently not bleed. There is no definite method, so far known as yet, for the evaluation of bleeding tendency in jaundice.

1. Blood coagulation factors.—Changes in blood calcium, fibrinogen, platelets, prothrombin, anti thrombin, sedimentation rate etc., are observed just as frequently without as with a haemorrhagic diathesis in jaundice.

a. Calcium.—There is undoubtedly a disturbed calcium metabolism in jaundice, such as

altered calcium balance, osteoporosis, etc. The general weight of experimental evidence seems to uphold that although a functional deficiency of calcium exists, it has no relation to the bleeding tendency. It is true that in jaundice intravenous calcium improves coagulation *in vitro*, but the mechanism by which it does so is not clear. Furthermore extravascular clotting has little relation to bleeding tendency. Intravenous calcium has not solved the problem of haemorrhage in jaundice. Blood calcium determinations, therefore, are of no value in determining the bleeding tendency.

b. Other blood coagulation factors.—Bancroft and others in a study of 200 surgical cases concluded that one factor can be isolated as a cause of bleeding or clotting. They devised a "clotting index" calculated from a composite of the determinations of the pro-thrombin content, fibrinogen content, platelet count, degree of platelet lysis and antithrombin. But there are two factors operating against the utilisation of "clotting index." The one is, that the clotting time can be determined reliably only after operation, but not before, because when a latent bleeding tendency exists, the ether damage to the liver and operative shock make it manifest. The other is that for clinical use, such a clotting index is entirely too elaborate.

2. Coagulation time.—Even this seems to have relatively little value. Moreover, the numerous

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factors affecting the clotting time of shed blood, such as contact with air, glass etc., make the interpretation very difficult. Besides, the prolonged coagulation time in jaundice is not so much an index of bleeding tendency as of liver damage.

3. *Bleeding Time*.—In bleeding conditions, the simple fact is that the patient bleeds. The problem is how to demonstrate beforehand that he is going to bleed. Though Duke's bleeding time is used universally, yet, it has been disappointing, to a large extent in jaundice. The latent bleeding tendency, such as is found in many cases of jaundice is not revealed by the ordinary puncture of the skin.

A factor which has received little attention in bleeding studies is the state of *tonicity* of the capillaries. In small vessels it is the retraction of their walls to a large extent which stops bleeding. No other factor can explain the fact that the normal bleeding time of 30 to 180 seconds is much less than the normal coagulation time. In a case of *Hæmophilia*, Von Bermuth found that the capillaries did not contract after being cut, but remained patent and continued to bleed. In a case of Werlhof's disease,* however, the capillaries reacted in the normal manner. This field offers fascinating possibilities for study and should be investigated further.

It was felt that if the factor of capillary tonus could be eliminated and the capillaries kept wide open, the situation would be simplified and a latent bleeding tendency revealed, if present. Such a situation is comparable clinically when ether, shock, operative trauma, etc., result in capillary paresis and bleeding.

The skin of the fore-arm near the elbow over the pronator muscles was selected as being uniformly thin without the disturbing factor of differences in hornification present on the finger tips. Ordinary Duke's puncture gave the usual bleeding time as 30 seconds to 3 minutes. Heat was then applied and another puncture done. No constant change was noted. Cold was then used; no dependable difference could be noted. Histamine was then injected intra-dermally to produce capillary paresis. No constant changes were found. 80 cases were studied in this manner.

One of us (A.C.I.) then suggested applying the cuff of sphygmo-manometer around the arm, with a pressure of about 40 millimeters of mercury, enough to cut off effectively the venous return. By increasing the pressure in the capillaries and arterioles in this manner, the factor of "capillary tonus" might be eliminated. This was done with most gratifying

results. After many trials the upper limit of normal for the venous pressure bleeding time was fixed at 240 seconds; it was rarely over 180 seconds.

But when the method was tried in a number of cases of jaundice, it was found that often, when the Duke's bleeding time was normal, the venous pressure bleeding time was definitely prolonged.

These cases with a prolonged venous bleeding time were almost always found to be the cases that bled, either spontaneously or after operation. In a study of 810 pathological cases, this fact was demonstrated repeatedly. We are not prepared to say just what is the mechanism involved but we do feel convinced that the method is of distinct value in predicting a haemorrhagic diathesis in jaundice.

THE PROBLEM OF DRAINING THE ABDOMINAL CAVITY IN CASES OF GENERAL PERITONITIS.

By M. G. BREITMAN, M.D. (of Moscow), W.S.S.R.

(Extracted from *Annals of Surgery*, Part 506, Feb. 1935.)†

When considering the question of when to drain the abdominal cavity in cases of acute peritonitis, it is difficult not to touch upon another no less important problem, how to drain it. The surgeons of all countries have reached some partial agreement, but there is no complete unity on this question.

Wegner defended the thesis that the peritoneum is able to fight infection—within certain limits. More recent investigators have agreed with Wegner's conclusion—but not however without some reservations. Wegner considered the absorbing capacity of the peritoneum as the chief means of struggle against infection; while at present it is generally accepted that the victorious struggle against bacteria takes place within the abdominal cavity. Besides this, Wegner looked upon the beneficial effect of absorption as a mechanical process, believing that the bacteria were simply carried away by the process of absorption; while to day we see the cause of destruction of the bacteria transferred into the blood circulation—in the germicidal power of the serum.

There are definite rules for the treatment of general acute peritonitis;

- (1) removal of the source of infection,
- (2) removal of the infected exudate, and prevention of its further generation,
- (3) restoration of normal conditions of circulation.

In connection with the first and third points, we may say briefly: it is necessary to operate cleanly and aseptically, suturing with great care, and finding and removing the nidus of infection, namely removal of the diseased appendix or in cases of perforated ulcers of the stomach or duodenum suturing, performing a gastro-enterostomy or resection; in cases of gangrenous cholecystitis removing the gall bladder etc. In all cases it is necessary to strive to remove the inflammatory nidus by means of resection or extirpation, or extra-peritonealization or finally by attaching the unsafely closed or isolated organ to the peritoneum. Rhen deems the most complete closure possible of the abdominal wound of great importance for the restoration of the abdominal pressure. This is, however, considered questionable after Horman's research work and Sprengel's objections. In any case, the closure of the abdominal wound is doubtless a technical improvement, resulting in better circulation in the abdominal cavity and breathing.

As to the second point, it must be said that although the majority of surgeons in all countries consider the removal of the exudate from the abdominal cavity as essential for the treatment of peritonitis, there are differences of opinion on the subject. Well says that, "peritoneal exudation is evidently the sole means of defence possessed by the abdominal cavity". Murphy considers the removal of exudate from the abdominal cavity a great error as the necessary defensive anti-bodies are also removed together with the exudate. He believes that purulent exudation contains defensive elements, and that its removal is harmful for the patient. After the removal of the diseased appendix Murphy leaves everything else to drainage and the curative powers of nature. He attaches great importance to the care after the operation and to Fowlers' position. Murphy has achieved good results through this method of treating peritonitis.

Exudation may be removed by drying or by irrigation of the abdominal cavity. Dry wiping has the merit that it cleanses the abdominal cavity quickly, and that the danger of spreading the pus is small. The demerits of this system are that it is very difficult to clean out everything, that it is a very rough method, and produces traumatic effects upon the serous membrane and that the wiping removes the fibrin which, on the one hand plays a certain role in the struggle with infection and the removal of which on the other hand, may cause later on adhesions and obstruction.

The opponents of irrigation of the abdominal cavity claim that it is impossible to achieve a real

disinfection of the abdominal cavity by means of irrigation; that on the contrary, the irrigation may bring infections to parts of the cavity previously free from it. Besides, Murphy thinks that irrigation injures the defensive powers of the peritoneum, hurts the serous membrane, and washes out the beneficial exudation while the bacteria remain.

Different antiseptic liquids have been used for irrigation, such as, solutions of salicylic acid and boric acid, rivanol etc. But antiseptic liquids have not become popular for the reason that in order to become effective the solutions must be strong—in which case they would result in a destruction of the tissues.

Different opinions are held as regards the utility of drainage of the abdominal cavity in peritonitis. To sum up briefly, it may be stated that there are undoubtedly cases when the abdominal cavity has to be drained—it depends on the opinion, decision and experience of the surgeon.

As far as the technique of drainage is concerned, the majority of surgeons, after proper manipulations, merely insert a rubber tube wrapped in one layer of gauze into Douglas pouch, according to Madelung. Some surgeons insert 2 or 3 drainage tubes. Moynihan inserts two tubes: one on the right, the other on the left side; Panchet inserts three tubes: one into the Douglas' pouch, one at the spot of the removed appendix and the third to the left.

The question arises, is it not possible to find a method of draining the abdominal cavity, in cases of acute peritonitis, which would on the one hand lessen the dangers connected with the drainage and on the other hand, be capable of accomplishing the task assigned to it.

It seems to me that the removal of exudate may be achieved in a sufficient measure, avoiding the dangers and complications connected with drainage, by applying the latter in the following manner. After the usual manipulations, the gastrocolic omentum, if it has not been already destroyed by some inflammatory process, is spread over the intestinal loops, the drainage tube wrapped in gauze is laid upon the omentum, then the abdominal wall is sutured by layers with the exception of the lower end of the wound, which serves as an outlet for the drainage tube. A sufficiently thick bandage is applied, so that it would absorb the exudate discharged through the drainage tube. On the next day the wet top layers of the bandage are changed. Applied in this manner the drainage tube is not located amid the intestinal loops, being isolated from the latter by the omentum. Consequently we may

* Purpura Haemorrhagica Ed.—I.M.J.

hope that there will be neither adhesions of the intestinal loops, nor injury to the intestinal walls due to the action of the tube. I am, of course, far from considering this method of draining a panacea for the treatment of peritonitis. It still lacks experimental data and the number of observations (six cases) is too few to draw conclusions from. I simply consider this method, the working hypothesis of a practical surgeon, which, it seems to me, deserves a certain amount of attention, and should be verified on a larger amount of material.

OVARIAN DYSFUNCTION AND STERILITY

(Extracted from the *B.M.J.* of 23-2-1935)

In a paper read before a meeting of the Liverpool Medical Institution in December 1934, Dr. T. N. A. Jeffcoate, M.D., F.R.C.S., etc., deals with the subject as follows. In some 10 to 20 per cent of cases of sterility, some abnormality will be present in spermatogenesis. It is more likely that an equal if not a greater number of cases of sterility is due to the absence of ovulation. There will be some interference with the formation and liberation of ova in the production of the above condition. Before proceeding on further, he very properly deals with the normal physiology of the normal ovarian and uterine cycles according to the modern conceptions, as follows:

The development of the Graffian follicle is brought about by Prolan A which is secreted by the anterior lobe of the Pituitary. The Corpus Luteum is formed as a result of the action of Prolan B, a second pituitary factor. The same pituitary gland causes the rupture of the Graffian follicle and also the liberation of the ripe ovum. The particular hormone that is responsible for the latter is not yet known. The cessation of Prolan A, or the onset of Prolan B may also be a possible cause of the rupture of the follicle. The ovum is set free between the 8 and 18th day of the menstrual cycle, especially 12 to 14th day. After the ovum is liberated, the follicle is converted into a corpus luteum.

The cyclical changes in the endometrium of the Uterus are due to hormones, Oestrin and Progesterin, which are liberated during the ovarian cycle. Oestrin is secreted by the cells of the developing Graffian follicle and after ovulation, by the central portion of the corpus luteum. This induces growth of the endometrium from the post-menstrual to the interval phase. Progesterin is derived from the corpus luteum. It produces further enlargement of the

endometrial glands and also responsible for the secretory activity of the endometrium.

It is known that a uterus which has been under the influence of Oestrin and Progesterin bleeds when the above influence is withdrawn. The removal of these two substances from the circulation precipitates hæmorrhage indirectly, by stimulating the production of a "bleeding factor," by the anterior lobe of the Pituitary. From 4th to 28th day the amount of Oestrin in the body gradually increases and reaches its maximum prior to the onset of menstruation. When the quantity of oestrin reaches a certain level, the secretion of Prolan ceases and corpus luteum degenerates immediately. The sudden decrease of Oestrin during the menstruation stimulates the Pituitary and this ensures the ripening of the Graffian follicle of the next ovarian cycle.

Sterility Associated with Menstrual Troubles

In 12 per cent of the author's cases, sterility was accompanied by menstrual upset varying in some cases from amenorrhoea to continued metrostaxis. The functional changes were accompanied by endometrites or hyperplasia of the uterine mucosa. This hyperplasia produces sterility since it interferes with the implantation of the ovum. The types of menstrual upset that were usually found in his cases were:—Secondary amenorrhoea; scanty menstruation; infrequent menses with periods of amenorrhoea; epimenorrhoea; epimenorrhagia; menorrhagia; metrostaxis; and cystic ovary.

The additional lesions that were found along with the above were, acute antifixion of the uterus; retrodisplacement of the uterus rigid introitus; pinhole os; erosion of the cervix; vaginites; thyroid dysfunction etc.

Secondary amenorrhoea and infrequent menses are due to the temporary suspension of the liberation of the "bleeding factor" from the anterior pituitary. They are also associated with some disorder of the secretion of the ovarian hormones.

Metrostaxis. In this condition, ovulation does not occur for long periods of time. The Graffian follicle, instead of ripening, continues to grow. The ovum dies. But the cells of the follicle remain active. Follicular cyst is formed. During this time, the endometrium is subjected to the prolonged stimulation of the follicular hormone, which induces hyperplasia. After varying lengths of time bleeding occurs.

Menorrhagia is due to the same causes as the above, that is, it is a form of anovular menstruation.

Epimenorrhoea and epimenorrhagia. In these types, the menstrual cycle is normal in every way

except that every phase of it is shortened. Ovulation occurs; 2 or more follicles rupture simultaneously. Fertility may take place in these types.

Scanty menstruation is probably due to primary under activity of the hypophysis.

There may also be some fault in, or the absence of ovarian rhythm. Menstruation may occur without ovulation. Hence in these cases sterility occurs.

The methods proposed for investigation are:—
1. Examination of the semen in all cases, 2. Insufflation of the fallopian tubes with air or carbon dioxide, 3. Curettage of the uterus between 21st and 28th day of the cycle to find out the condition of the endometrium, 4. Dilatation of the cervix as a therapeutic measure after curetting since stenosis of the cervix is often present in such cases.

Treatment of sterility due to absence of Ovulation this is always due to the absence of the Pituitary hormone. Therefore it should be administered. Pituitary may also be stimulated by small doses of x-rays. The administration of the active principle of thyroid gland may also be found useful.

Y.S.R.

A CHAPTER OF ACCIDENTS IN A CASE OF KALA-AZAR.

By A. PINEY, M.D. (Birm.), M.R.C.P. (Lond.)
(Extracted from the *Lancet*, Vol. CCXXVIII
dated, April 6, 1935)

There is a modern prejudice against the publication of single cases, but there are occasions when a patient presents so many points of interest that it is improbable that a series of similar observations could even be collected. In the present case there was such a concatenation of accidents as is never likely to be repeated.

Mrs. A., aged 39, whom I saw at the request of Major J. R. Yourell, R.A.M.C. (ret.), had been in India in 1929 and again in 1932. During her stay there she had not suffered from any disability other than slight concussion, due to a fall from her horse. When I saw her on July 29th, 1934, she said that she had been feeling unwell for about twelve months, and that she had had an almost persistent evening temperature in the region of 100.6°F. For a time she had been treated for colitis, and in April, 1934, there had been some argument about the palpability of her spleen, but this discussion was stopped because she apparently developed an acute cholecystitis, which was operated on by Mr. E. K. Martin, who found only a distended gall-bladder with no signs of calculus or infection. She was gravely ill

but recovered relatively rapidly, although the evening rise of temperature persisted.

When I saw her she was extremely pale: there were a few pigmented patches on the inner sides of the arms, the spleen was firm and slightly tender, extending down as far as the umbilicus. The liver was also enlarged, extending three fingers-breadth below the costal margin. The blood showed:—

Red Corpuscles	...	2,300,000	per c. mm.
Leucocytes	...	2,000	" "
Haemoglobin	...	88	per cent.
Neutrophils	...	70	" "
Monocytes	...	20	" "
Lymphocytes	...	10	" "

The clinical and hæmatological characters suggested the possibility of kala-azar, and the patient was seen by Dr. Carmichael Low. A liver puncture was performed but although many endothelial cells were found in films, no definite Leishman-Donovan bodies were recognised.

Treatment with intravenous Neostibosan was started, and by the end of a week there was distinct decrease in the size of the spleen. On the eighth day there developed great abdominal distension, and enemas, acetylcholine, and Prostigmin failed to cause any improvement. As the condition became definitely worse, Mr. A. L. Abel performed a laparotomy on August 9th, 1934, and found a volvulus on the pelvic colon. At operation there was a small amount of clear fluid in the peritoneum and a peculiar semi-gelatinous thickening of the mesentery. The cæcum was brought to the surface but not opened as we thought that a "safety-valve" might be needed later. She did very well after the operation, although the temperature never settled. At this time, there was slight oedema of the ankles. Treatment with neostibosan was continued until 3.0 g. had been given, and on August 29th the spleen was not palpable and the liver did not appear to be enlarged. The oedema of the ankles had slightly increased and, indeed, extended half-way up the calves. The temperature was normal and all looked very promising, especially as the hæmoglobin was now 69 per cent.

On August 10th the temperature started to rise again and oedema of the legs extended right up to the thighs, and at the same time there was much fluid in the abdomen. The next day the right side of the chest was full of fluid, but even so the amount of urine passed was not decreased and there was no albuminuria. The blood-urea level was normal. There was now so much respiratory embarrassment that she was seen by Dr. G. E. Beaumont,

at whose suggestion she was given a transfusion and an injection of Salyrgan. It was difficult to find a vein for the transfusion, as so many had been used for neostibosan and for pre and post-operative transfusions, but nevertheless it was done. The urine output fell and nothing influenced it. The oedema became enormous, the abdomen was distended with fluid, and both sides of the chest were full. The prognosis seemed hopeless, and this view was confirmed by Lord Horder. So convinced were the nurses of her impending death that the matron of the nursing-home, who was short of space, let my patient's room: In a despairing attempt I injected 5 c. cm. of salyrgan intravenously at a time when the patient was almost unconscious, and within twelve hours she had passed 6 pints of urine and was feeling better. All this time the blood-urea was only slightly raised and there was only the faintest haze of albumin in the urine; casts were absent. She was put on ammonium nitrate and was given several more injections of salyrgan until the oedema had disappeared and she was feeling well; but the temperature never became quite steady, although the evening rise was never above 100°.

For a month all seemed to be going well, although slight oedema of the ankles had recurred. The patient was being kept in the nursing-home only because she was so thin and weak that it was felt better to prolong her stay. Her hæmoglobin was 72 per cent. and her leucocyte count, total and differential, was normal.

Suddenly, exactly one month after her last collapse, she had a violent fit without any prodromata. The nurse was taking her pulse when Mrs. A. cried out, went through a clonic stage into a tonic one, and remained unconscious. I saw her three-quarters of an hour later when she had had two more fits. She was deeply unconscious, and while I was examining her had another seizure, which was a typical epileptiform one. Dr. F. M. R. Walshe kindly saw her in consultation with me within two hours of the first fit and could find no explanation. Soluble Luminal was given, and after three more slight fits in the night no more occurred, although the patient remained unconscious. After 24 hours I did a lumbar puncture: the fluid was not under pressure, was clear, and chemically and cytologically normal. Within two hours there were signs of returning consciousness. No urine was passed for 36 hours, and only 2 oz. could be drawn off by catheter. This was loaded with albumin, but there were only a few hyaline casts present. There was now enormous

anasarca, but the blood-urea was never above 50 m.g. per 100 c. cm. The blood pressure was 150/100, which was surprising, for it had never been raised before the first fit. The chest was again full of fluid, which, on Dr. F. G. Chandler's advice, was not aspirated.

The signs of returning consciousness were so encouraging that I once more tried salyrgan, giving 3 c. cm. intramuscularly, and in the following 24 hours she passed 296 oz. of urine! By the time she had passed 100 oz. consciousness had returned. And after three more doses of salyrgan all oedema had gone, the blood pressure was normal, and she felt well. But the temperature still ranged between 99° and 101°, and no cause for this could be discovered. So, on purely empirical grounds, I gave her a series of subcutaneous injections of arsenious acid (rising from 1 mg. to 10 mg. and down again), and her temperature became normal and stayed so.

She returned home in time for Christmas, 1934, still being thin and weak on the legs, and still having an extensor plantar reflex on the right side. Since then she has continued to regain strength, the plantar reflex has become normal, and her temperature has not been above 98.4°. Her blood is normal and one may presume that after having been given up three times she is now cured. But what was the nature of her renal lesion is indeed a mystery.

The case seemed to be worthy of record because one so often tries to encourage relatives by saying "while there is life there is hope", but it is rare to meet a case in which this tentative optimism is justified.

Notices

1. A gold medal called the "Rai Shambhu Dayal Sahib Gold Medal" will be presented for the best prize essay on a public health subject to be announced each year.
2. The subject of the next essay is "A practical scheme for rural reconstruction with special reference to matters pertaining to public health."
3. The competition will be open to the general public, including the medical and the public health workers in the United Provinces.
4. The essay is to be written in Hindi and should not exceed 8,000 words in length.

5. Essays should reach the Medical Officer Incharge, Provincial Hygiene Institute, United Provinces, Lucknow, by Nov. 30, 1935.

6. The name and address of the competitor must be distinctly written on each essay submitted and the envelope should have the words "Prize Essay" in the top left-hand corner.

7. The Director of Public Health, United Provinces, shall judge the merit of the essay and his decision with regard to the award of the medal shall be final.

8. No correspondence will be entered into on the subject of competition.

9. No essay will be returned.

THE LUXEMBURG POSTAGE STAMPS IN AID OF PROFESSIONAL WORKERS

In these days of profound upheavals, political insecurity and economic depression, professional workers have been exceptionally hard hit by the general tendency to debase intellectual values. Political events have deprived innumerable professional workers in many countries of the possibility of carrying on their professional activities and earning of living. They were compelled to leave their country and seek a new start abroad. Professors, journalists, artists, lawyers, physicians, most of whom have not become rich in the course of their previous career, have taken refuge in foreign countries where they are struggling desperately for a living, more desperately indeed than would perhaps manual workers or businessmen in a similar position, for it takes a very long time for the work of a professional worker to bear fruit.

Meanwhile, these displaced professional workers are in danger of actual starvation. International assistance and organisations have done their utmost to help them to bridge over until they can find work; but time goes on, private funds are exhausted, while the distress of the professional workers who have as yet failed to find some means of livelihood abroad, is getting worse every day.

Nor for the first time a European Government has initiated a broad international relief action to alleviate the distress of the displaced scientists, artists and other professional workers, and afford them a waiting spell. The Government of Luxemburg has just issued a special set of postage stamps bearing a surplus tax, the amount of which will be devoted to the assistance of refugee professional workers of all countries, who were forced to leave their homes as a result of political events, and who would perish if no help were forthcoming.

The stamps are of exceptional interest, for they display symbolic images of those whom the issue is meant to help, and represent a professor, a painter, a journalist, an engineer, a chemist, a lawyer and a physician. These stamps will travel all over the world proclaiming the warm-hearted generosity of a minute country which has given a practical expression of its sense of duty towards humanity by helping those to whom humanity owes so much. These stamps should shake the general indifference in regard to the distress of refugee professional workers which merits the interest of civilised humanity. Let us hope that this humanitarian postage stamps issue will meet with well deserved success.

The stamps which have been issued early in May, are, like all Luxemburg stamps, a great philatelic rarity. They will be available for about a year and may be purchased either at Luxemburg post offices, or at leading stamps dealers all over the world.

Information Bureau

(This column is specially opened to give such information as will be useful to the medical licentiates of India. For more detailed information, write to Dr. U. B. Narayan Rao, General Secretary, A. I. M. L. A., 94, Girgaum Road, Bombay 4, who will respond to enquiries promptly. (Ed. I.M.J.).

LIST OF HONORARY MEDICAL OFFICERS (LICENTIATES)

MADRAS PRESIDENCY

Dr. G. Parameshwara Raman, L.M.P., Honorary Clinical Assistant, Dental Department, Government General Hospital, Madras.

Dr. C. S. Raman, L.M.P. Honorary Clinical Assistant, Dental Department, Government General Hospital, Madras.

Dr. P. Govindrajulu, L.M.P., Honorary S.A.S., E.N.T., Department, Government Royapuram Hospital, Madras.

Dr. V. C. Sudersanam, L.M.P., Hon. S.A.S., Ophthalmic Department, Government Royapuram Hospital, Madras.

Dr. M. Radhakrishnan, L.M.P. Honorary Clinical Assistant, Dental Department, Government Royapuram Hospital, Madras.

Dr. V. Viswanathan, L.M.P., L.O., Honorary Assistant Surgeon, Ophthalmic Department, Government Royapetta Hospital, Madras.

Dr. V. Samuel, L.M.P., Honorary S.A.S., Government Royapetta Hospital, Madras.

Dr. V. T. Desikachari, L.M.P., Honorary Clinical Assistant, Government Royapetta Hospital, Madras.

Dr. C. V. C. Rao, L.M.P., Honorary Clinical Assistant in E.N.T. Diseases, Government Royapetta Hospital, Madras.

Dr. N. Shrinivasarao, L.M.P., Honorary Clinical Assistant, Government Hospital, Tirupati.

Dr. R. Lakshmana Rao, L.M.P. Honorary Clinical Assistant in Radiology, Government Head Quarters Hospital, Coimbatore.

Dr. Mrs. A. D. Rajanayagam, L.M.P., Honorary Woman Clinical Assistant, Government Hospital, Erode.

Dr. G. Viraraju, L.M.P., Honorary Clinical Assistant, Government Hospital, Parlakimedi.

Dr. C. P. Satyanarayan, L.M.P., Honorary Sub-Assistant Surgeon, Government Head Quarters Hospital, Ellore.

Dr. Mrs. D. L. Chirangivi, L.M.P., Honorary Clinical Assistant, Government Head Quarters Hospital, Guntur.

Dr. Varada Bangaram, L.M.P., Honorary Sub-Assistant Surgeon, Government Hospital, Chirala.

Dr. K. Dassappa Rai, L.M.P., Honorary Sub-Assistant Surgeon, Government Hospital, Puttur.

Dr. P. Seshagiri Rao, L.M.P., Honorary Clinical Assistant Government Hospital, Gudivada.

Dr. P. Murugesan, L.M.P., Honorary Assistant, Bacteriologist, K. E. VII. M. Government Institute for T.B., Egnore, Madras. (Transferred to the Medical College, Madras, till 6-7-35).

Dr. A. B. Siva Rao, L.M.P., Honorary Clinical Assistant, Government Head Quarters Hospital, Anantapur.

Dr. N. Mahalingham, L.M.P., Honorary Clinical Assistant, Government Pentland Hospital, Vellore.

Dr. M. Shrinivas Mudaliyar, L.M.P., Honorary Clinical Assistant, Government Hospital, Tirupattur.

Dr. P. Vaidyanathan, L.M.P., Honorary S.A. Surgeon, Government Head Quarters Hospital, Cuddalore.

Dr. A. Shrinivasachari, L.M.P. Honorary Clinical Assistant, Venereology, Government Head Quarters Hospital, Bellary.

Dr. G. Rajagopalan, L.M.P. Honorary Clinical Assistant, Leprosy Clinic, Government Dispensary, Saidapet.

Dr. N. Sripathi Chetty, Honorary Clinical Assistant, Dental Suregery, Government Head Quarters Hospital, Chittoor.

Dr. T. K. Narayanan, L.M.P., Honorary Clinical Assistant, Government Head Quarters Hospital, Coimbatore.

Dr. G. B. Raj, L.M.P., Honorary Clinical Assistant, Government Head Quarters Hospital, Coimbatore.

Dr. V. V. Krishna Rao, L.M.P. Honorary Sub-Assistant Surgeon, Government Head Quarters Hospital, Cuddappa.

Dr. J. Venkatramana Naidu, L.M.P., Honorary Sub-Assistant Surgeon, Government Hospital, Peddapuram.

Dr. G. V. Hanumantha Rao Garu, L.C.P.S., L.M.P., L.O. Honorary Clinical Assistant, Government Head Quarters Hospital, Guntur.

Dr. H. M. Rao, L.M.P., Honorary Clinical Assistant in Dentistry, Government Head Quarters Hospital, Guntur.

Dr. P. Krishna Das, L.M.P., Honorary Clinical Assistant, Government Hospital, Narasaraopet.

Dr. P. Madhavarao, L. M. P., L. M. (Dub.), Honorary Clinical Assistants, in E.N.T. Disease Government Head Quarters Hospital, Masulipatam.

Dr. D. Nainar, L.M.P., Honorary Sub-Assistant Surgeon in Dental Department, Government Head, Quarters Hospital, Madura.

Dr. R. Anantanarayanan, L.M.P., Hon. Clinical Assistant, Government Head Quarters Hospital, Madura.

Dr. M. Sundaram, L.M.P., Hon. Sub-Assistant, Surgeon, Government Head Quarters Hospital, Calicut.

Dr. P. T. Karnukaran Nayar, Hon. Sub-Assistant Surgeon, Government Hospital Tellicherry.

Dr. H. Krishnan, L.M.P., Hon. Clinical Assistant, Government Hospital, Tellichery.

Dr. S. Venkatasubbayya, L.M.P., Hon. Ophthalmic Clinical Assistant, Government Head Quarters Hospital, Nellore.

Dr. C. N. Narayanan, L.M.P., Hon. Clinical Assistant E.N.T. Department, Government Head Quarters Hospital, Ootacamund.

Dr. D. Sunderraja, L.M.P., Hon. Clinical Assistant in venereal Department, Government Head Quarters Hospital, Ootacamund.

Dr. M. Palaniyappan, L.M.P., Hon. Clinical Assistant, Government Hospital, Virudhunagar.

Dr. V. Krishnamurti, L.M.P., Hon. Clinical Assistant, Government Hospital, Mannargudi.

Dr. M. Ramasubbramanyam, L.M.P., Hon. Sub-Assistant Surgeon, Government Hospital, Palni.

Dr. Miss P. Radhalakshmi, L.M.P., Hon. Woman Clinical Assistant, Government Hospital for Women and Children, Calicut.

Dr. V. Narayana Achari, L.M.P., Hon. Clinical Assistant, Government Head Quarters Hospital Palamcottah.

Dr. P. S. Venkatraman L.M.P., Hon. Assistant Surgeon, Government Hospital, Tuticorin.

Dr. V. Subramanyan, L.M.P., Hon. Sub-Assistant Surgeon, Dental Department, Government Head Quarters Hospital, Trichinopoly.

Dr. C. Narayana Menon, L.M.P., Hon. Clinical Assistant, E.N.T. Department, Government Head Quarters Hospital, Trichinopoly.

Dr. T. P. Shrinivasan, L.M.P., Hon. Clinical Assistant, Government Hospital, Karur.

Dr. K. A. Chidambara Ayyer, L.M.P., Hon. Clinical Assistant, Government Hospital, Srirangam.

BARODA STATE

Dr. N. L. Shah, State General Hospital, Vada Falia, Ghee Kanta, Tower.

Dr. G. P. Patel, State General Hospital, Sultanpura, Chitania Sheri.

Dr. C. L. Patel, State General Hospital, Vada Falia, Ghee Kanta, Tower.

NORTH-WESTERN FRONTIER PROVINCE

Dr. L. Vishwa Mittar, L.S.M.F. (Punjab), Lady Reading Hospital, Peshawar. (Temporary Training).

UNITED PROVINCES

Dr. Madan Gopal Tandon, L.S.M.F., Sadar Hospital, Gonda.

Dr. Bhagwat Saran, L.S.M.F., Sadar Hospital, Muzaffarnagar.

Dr. A. N. Bajel, L.D. Sc., Thompson Hospital, Agra.

There are no Licentiates working as Honoraries in Hospitals or Dispensaries in the following Provinces.

i. Rajputana—(Ajmer—Merwara).

ii. Gwalior State.

iii. Mysore Medical Department. (whole of Mysore & Bangalore).

iv. Central Provinces.

v. Punjab Province.

vi. Burma Province.

vii. Bihar & Orissa (No information).

Service Notes

STATEMENT SHOWING CHANGES AMONGST SUB-ASSISTANT SURGEONS IN THE PUNJAB DURING THE MONTH OF JANUARY, 1935

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
Dr. Raghu Nath Ri Grover,	General Duty, Civil Hospital, Dera Ghazi Khan	Shadan Lund Dispensary, Dera Ghazi Khan District	Relieving Sub-Assistant Surgeon Dr. Prem Nath Aggarwal proceeded on 2 months leave
„ Gurdit Singh Attariwala,	General Duty, Civil Hospital, Gojra, Lyallpur District	Khurrianwala Dispensary Lyallpur District	
„ Puran Chand		Kot Adu Dispensary, Mizaffargarh District	On return from leave
„ Balwant Singh, L.M.P., (Cal.)	General Duty, Civil Hospital, Ludhiana.	Narot Dispensary, Gurdaspur District	Relieving Sub-Assistant Surgeon Doctor Hari Singh Mahindra proceeded on two months leave
„ Ramzan Ali,	General Duty, Civil Hospital, Gojra, Lyallpur District	Canal Dispensary, Gojra, Lyellpur District	Relieving Sub - Assistant Surgeon Doctor Isher Das proceeded on 1½ months leave

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
Dr. Hakumat Rai,		General Duty, Civil Hospital, Jhelum	On expiry of leave
„ Ram Ditta Kapur,	General Duty, Civil Hospital, Gidderbaha, Ferozepore District	Pehows Dispensary Karnal District	Relieving Sub - Assistant Surgeon Doctor Ram Chand Sharma proceeded on one months leave
„ Muhammad Hussain,	General Duty, Civil Hospital, Multan	Jail and Police Hospitals, Jhang	Relieving Sub - Assistant Surgeon Doctor Sukh Dyal Babar proceeded on 2 months leave
„ Tola Ram Malak,		Police Hospital, Mianwali	On return from leave
„ Sadiq Ali Bukhari	Police Hospital, Mianwali	General Duty, Civil Hospital, Mianwali	
„ Jagan Nath Gosain	General Duty, Civil Hospital, Sheikhupura	Kot Pindi Das Dispensary Sheikhupura District	Relieving Sub - Assistant Surgeon Doctor Nand Gopal Sethi proceeded on 2 months leave
„ Ved Vias Bedi		General Duty, Civil Hospital, Jhelum	On expiry of leave
„ Ved Vias Bedi	General Duty, Civil Hospital, Jhelum	General Duty, Civil Dispensary, Lahore	
„ Beant Singh	General Duty, Civil Hospital, Ferozepore	Sub - Jail Hospital, Kasur, Lahore District,	Relieving Sub - Assistant Surgeon Doctor Parmeswar Singh Sodhi proceeded on 3 months leave
„ Diwan Chand 1st Class Senior		General Duty, Civil Hospital, Sialkote	On expiry of leave
„ Muhammad Ibrahim	General Duty, Punjab Dental Hospital, Lahore	Mandot Dispensary, Ferozepore District	Relieving Sub - Assistant Surgeon Doctor Ibad Ullah proceeded on 4 months leave
„ Asa Ram	General Duty, Civil Hospital, Multan	General Duty, Civil Hospital, Rohtak	
„ Ram Chand	General Duty, Civil Hospital, Jullundur	Guru Harsahai Dispensary, Ferozepore District	Vice Sub-Assistant Surgeon Doctor Kaku Ram proceeded on 2 months leave
„ Ram Kishen	General Duty, Civil Hospital, Hoshiarpur	Barapind Dispensary, Jullundur District	Relieving Sub - Assistant Surgeon Doctor Sheo Das proceeded on 2 months leave
„ Mool Chand		General Duty, Civil Hospital, Gidderbaha Ferozepore District	On return from leave
„ Uddham Singh	General Duty, Civil Hospital, Multan	New Central Jail, Multan	Relieving Sub - Assistant Surgeon Doctor Sher Singh L.T.M. proceeded on 3 months leave

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
Dr. Gurdit Singh		Dharuhera Dispensary, Gurgaon District	On return from leave
„ Harnam Singh Saini	Dharuhera Dispensary Gurgaon District	General Duty, Civil Hospital, Gurgaon	
„ Qadir Bakhs			Proceeded on 2 months leave on reversion to the Punjab
„ Diwan Chand			Granted one months extension of leave
FEBRUARY 1935			
Dr. Sardar Singh		General Duty, Civil Hospital, Gujrat	On reversion from Detention Jail, Deoli
„ Tara Singh,			
„ Hira Lal Sur	General Duty, Civil Hospital, Gujrat	Canal Dispensary, Rajar, Gujrat District	Granted three months extension of leave
„ Bishen Chand Bhatia	Dhar Dispensary, Simla	Jatusana Dispensary, Gurgaon District	Relieving Sub-Assistant Surgeon Doctor Puran Singh Bhatia proceeded on 2 months leave
„ Harnam Singh Saini	General Duty, Civil Hospital, Gurgaon	Ferozepur-Jhirka Dispensary, Gurgaon District	Relieving Sub-Assistant Surgeon Doctor Noor Mohd. proceeded on 2 months leave
„ Muhammad Ayub Khan	Tamman Dispensary, Attock District	General Duty, Civil Hospital, Campbellpur, Attock District	
„ Sita Ram Malik	General Duty, Civil Hospital, Multan	Luddan Dispensary, Multan District	
„ Asaram	General Duty, Civil Hospital, Rohtak	Barwala Dispensary, Hissar District	Relieving Sub-Assistant Surgeon Doctor Amar Singh Grewal, proceeded on 4 months leave
„ Tara Chand	Canal Dispensary, Madhopur District	Police Hospital, Rawalpindi	
„ Muhd. Aslam Qureshi	Police Hospital, Rawalpindi	Central Jail, Montgomery	Relieving Sub-Assistant Surgeon Doctor Bogha Ram proceeded on 4 Months leave on medical certificate
„ Gurbaksh Rai	General Duty, Mayo Hospital, Lahore	Khol Dispensary, Gurgaon District	Relieving Sub-Assistant Surgeon Doctor Devi Ditta Mall proceeded on one months leave

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
„ Gobind Ram	General Duty, Civil Hospital, Sergodha	Canal Dispensary, Shahjewan, Jhang District	Relieving Sub-Assistant Surgeons Doctors Devi Ditta Mall proceed on one months leave
„ Sadiq Ali Bukhari	General Duty, Civil Hospital Mianwali	Police and Sub-Jail Hospitals, Hoshiarpur	
„ Bhagat Ram Puri, 2nd Class Senior		Kadirabad Dispensary Gujrat District	On expiry of leave
„ Ishar Das Mehta	Kadirabad Dispensary,	General Duty, Civil Hospital Gujrat	
„ Muhd. Ayub Khan	General Duty, Civil Hospital, Campbellpur	Canal Dispensary, Lunda Multan District	
„ Dharamatma Singh		Mani Majra Dispensary, Ambala District	On expiry of leave relieving S.A.S. Dr. Radha Kishen proceeded on 3 months leave
„ Ram Chand Sharma		Pehowa Dispensary, Karnal District	On return from leave
„ Sri Niwas Rampal	General Duty, Punjab Dental Hospital, Lahore	Canal Dispensary, Munak, Karnal District	Relieving 2 Class Senior S.A.S. Dr. Mathra Das proceeded on 2 months leave
„ Ramditta Kapur	Pehowa Dispensary, Karnal District	Jail Hospital, Ludhiana	Relieving S.A.S. Dr. Faqir Chand proceeded on 1 months leave
„ Kesho Ram Nanda	General Duty, Civil Dispensary, Lahore	City Dispensary, Ludiana	Vice 1st Class Senior S.A.S. Dr. Kamal-ud-Din proceeded on 2 months leave
„ Bhagwan Singh Chandhri	General Duty Civil Hospital, Amritsar	Hajipur Dispensary, Hoshiarpur District	
„ Bal Kishen	Hajipur Dispensary, Hoshiarpur District	Mukerian Dispensary, Hoshiarpur District	
„ Harbans Lal, M.S.M.F. (Pb.)	Mukerian Dispensary, Hoshiarpur District	Civil Dispensary, Dalhousie	
„ Diwan Chand		Transfer Dispensary, Karnal District	On expiry of leave
„ Sher Singh	Canal Dispensary, Lunda, Multan Dist	Central Jail, Montgomery	Relieving S.A.S. Dr. Sandagar Singh Gill proceeded on 2 months leave
„ Ramzan Ali	Canal Dispensary, Gojra, Lyallpur Dist	General Duty, Civil Hospital, Gojra, Lyallpur District	
„ Muhammad Ayub Khan	General Duty, Civil Hospital, Campbellpur	Canal Dispensary, Lunda, Multan District	
„ Arjan Singh		Tamman Dispensary, Attock District	On return from leave
„ Randhir Singh	General Duty, Civil Hospital, Ludhiana	Kartarpur Dispensary, Jullundur District	

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
„ Lal Singh Randhawa	Kartarpur Dispensary Jullundur District	General Duty, Punjab Dental Hospital, Lahore	
„ Harbhagwan Kakkar	General Duty, Civil Hospital, Gujrat	General Duty, Civil Hospital, Sialkote	
„ Feroze-ud-Din		Dhar Dispensary, Simla	On return from leave
„ Surat Singh Grewal M.B., B.S.	Khurianwala Dispensary, Lyallpur District	Canal Dispensary, Madhopur Gurdaspur District	
„ Hakumat Rai	General Duty, Civil Hospital, Jhelum	Sohawa Dispensary, Jhelum District	Relieving S.A.S. Dr. Dhan Raj proceed on 4 months leave
„ Naubat Rai	Kot Adu Dispensary, Muzaffargarh Dist	General Duty, Civil Hospital, Muzaffargarh	
„ Mul Singh 2nd Class Senior		Khanpur Dispensary, Jhelum District	On return from leave
„ Nawab Ali, 2nd Class Senior		Sammundri Dispensary, Lyallpur District	On expiry of long leave
„ Mohan Lal 1st Class Senior	Sammundri Dispensary, Lyallpur District	Chak Jhumera Dispensary, Lyallpur District	
„ Thakar Das	Chak Jhumera Dispensary, Lyallpur District		
„ Tara Chand	Khanpur Dispensary, Jhelum District	General Duty, Civil Hospital, Jhelum	

MARCH, 1935

Dr. Abdul Karim, 2nd Class Senior Chhota Simla Dispensary			Granted 18 days extension of leave
„ Sardar Singh, General Duty, Civil Hospital, Gujarat			Proceeded on one month's leave
„ Mukand Lal, 2nd Class Senior	Sub Charge, Civil Hospital, Ludhiana	Shahabad Dispensary, Karnal District	
„ Mul Raj Aggarwal	Shahabad Dispensary, Karnal District	Bahora Kalan Dispensary, Gurgaon District	
„ Isher Das Mehta	General Duty, Civil Hospital, Gujart	Kallar Kahar Dispensary, Jhelum District	
„ Kaku Ram		General Duty, Punjab Mental Hospital, Lahore	On return from leave
„ Ganga Ram Chopra	Canal Dispensary, Gojra, Lyallpur District	Canal Dispensary, Manouana, Gujranwala District	

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
„ Amar Nath Das	Canal Dispensary, Nanoana, Gujranwala District	Canal Dispensary, Kalaski, in the same district	
„ Rajindar Nath	Thanesar Dispensary, Kanral District	General Duty, Kuthal Dispensary in the same district	
„ Hassan Muhammad	Canal Dispensary, Wer, Jhang District	General Duty, Civil Hospital, Gojra, Lyallpur District	
„ Behari Lal	Kallar Kahar Dispensary, Jhelum District	Camp Jail Hospital, Attock	Relieving Doctor Manohar Lal Kaisth proceeded on 4 months leave
„ Balmokand	General Duty, Civil Hospital, Montgomery	Darai Sidhu Dispensary, Multan District	
„ Nand Gopal Sethi		Kot Pindi Das Dispensary Dheikhupura District	On return from leave
„ Jagan Nath Gosain	Kot Pindi Das Dispensary, Sheikhpura District	Canal Dispensary, Najabat, Lahore District	
„ Chhabil Das	Civil Dispensary, Dalhousie	Sub Charge, Civil Hospital, Ludhiana	
„ Mukand Ram Babar	Canal Dispensary, Kalaskhi, Gujranwala District	Mattiwara Dispensary, Ludhiana District	
„ Faqir Chand, Jail Hospital, Ludhiana			Granted 3 months extension of leave
„ Pirthi Singh Dabas	Bahora Kalan Dispensary, Gurgaon District	Jail and Police Hospitals, Hissar	Relieving Dr. Dham Lal Bawa whose services have been placed at the disposal of the chief Medical Officer, Delhi Province
„ Nanak Singh Saigal	General Duty Mayo Hospital, Lahore	Attari Dispensary, Amritsar District	
„ Parmeshwar Singh Sodhi		General Duty, Civil Hospital, Ferozepore	On return from leave the unexpired portion of which is cancelled
„ Kirpa Ram	Canal Dispensary, Chuharkhan, Sheikhpura District	General Duty, Civil Hospital, Dheikhupura	
„ Kirpa Ram, General Duty, Civil Hospital, Sheikhpura			Proceeded on one month's leave
„ Tola Ram Malak	Police Hospital Mianwali	Kot Adu Dispensary, Muzaffargarh District	
„ Walayat Shah	General Duty, Punjab Dental Hospital, Lahore	Bandi Dispensary, Ferozepore District	Relieving Dr. Shamsber Singh proceed on 1 month and 6 days leave

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
„ Shadi Ram, 2nd Class Senior		Canal Dispensary Bainsi, Rohtak District	On reversion from the N. W. Railway Relieving Dr. Ram Darab Gupta seconded for employment on the N. W. Railway
„ Fazal Haq Qureshi, sutlej Valley Project Dispensary, Pallah, Multan District			Proceeded on 25 days leave
„ Devi Ditta Nal		Canal Dispensary, Shahjiwana, Jhang District	On return from leave
„ Gobind Ram	Canal Dispensary, Shahjiwana, Jhang District	General Duty, Civil Hospital, Sargodha	
„ Shiv Ram Dass	Sarai Sidhu Dispensary, Multan District	Zaffarwal Dispensary, Sialkote District	
„ Parmeshwar Singh Sodhi	General Duty, Civil Hospital, Ferozepore	General Duty, Civil Hospital, Gidderbaha, Ferozepore District	
„ Megh Raj 2nd Class Senior	Attari Dispensary, Amritsar District	Kahna Nau Dispensary, Lahore District	
„ Harbhagwan Kakkar	General Duty, Civil Hospital, Sialkote	Jail and Police Hospitals, Sialkote	
„ Amar Nath Marwah, L. T.M. (Cal)	Jail and Police Hospitals, Sialkote	Sohawa Dispensary, Jhelum District	
„ Sukh Dayal Babar		General Duty, Civil Hospital Jhang	On expiry of leave
„ Ghulam Mubamad	General Duty, Civil Hospital, Amritsar	Police and Sub Jail Hospitals, Amritsar	
„ Prem Nath Aggarwal		Punjab Mental Hospital, Lahore	On return from leave the unexpired portion of which is cancelled
„ Mohan Lal, 1st Class Senior		Chak Jhumra Dispensary, Lyallpur District	On expiry of leave
„ Thakar Das	Chak Jhumra Dispensary, Lyallpur District	General Duty, Civil Hospital, Lyallpur	
„ Daulat Singh Dhur	Canal Dispensary, Najabat, Lahore District	Banjar Dispensary, Kangra District	
„ Puran Chand	Kot Adu Dispensary, Muzaffargarh District	Karor Dispensary in the same district	
„ Abdul Karim, 2nd Class Senior		Civil Dispensary, Chhota Dimla	On return from leave

APRIL 1935

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
Dr. Mool Chand Ghei Civil Hospital, Murree			Granted 15 days leave
„ Udai Bhan	Old Central Jail, Multan	Mankera Dispensary, Mianwali District	
„ Ghulam Muhammad	Zaffarwal Dispensary, Sialkote District	Old Central Jail, Multan	
„ Manohar Lal		General Duty, Civil Hospital Karnal.	On return from leave
„ Ishar Das		General Duty, Civil Hospital, Lyallpur	On expiry of leave
„ Sukh Dyal Babar	General Duty, Civil Hospital, Jhang	Canal Itinerating Dispensary, Jampur, Dera Ghazi Khan District	
„ Ghulam Hussain	Police and Sub-Jail Hospital, Amritsar	X-Ray Department, Civil Hospital, Lyallpur.	Relieving Dr. Hazara Singh proceeded on 4 months leave
„ Daulat Ram Maineratta L.T.M. (Cal).	Midh Dispensary, Shahpur District	General Duty, Civil Hospital, Sargodha.	
„ Mohan Singh	Anæsthetist, Mayo Hospital, Lahore	Vanike Dispensary, Gujranwala District.	
„ Gobind Ram	General Duty, Civil Hospital, Sargodha	Jail Hospital, Mianwali.	Relieving Dr. Sujan Singh proceeded on 3 months leave
„ Madan Gopal Shorey		General Duty, Mayo Hospital, Lahore.	On reversion from Delhi Province
„ Ibad Ullah		General Duty, Civil Hospital Gurdaspur.	On expiry of leave the unexpired portion of which is cancelled
„ Charan Das	Kahrer Dispensary; Muzaffargarh District	Tulamba Dispensary, Multan District.	Relieving Dr. Ram Narain Wadhwa proceeded on 3 months leave
„ Narain Singh Gurkha	Banjar Dispensary, Kangra District	Sujanpur Tira Dispensary in the same district	
„ Uggar Sain, M.S.M.F. (Pb).	Sujanpur Tira Dispensary, Kangra District	Dera Gopipur Dispensary in the same district	
„ Narain Das Mahajan	Jaijon Dispensary, Hoshiarpur District	Kamarmashani Dispensary, Mianwali District	
„ Kaku Ram	General Duty, Punjab Mental Hospital, Lahore	Guru Harsahai Dispensary, Ferozepore District	

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
„ Muhammad Abdulla Khan Ahmedy	Civil Dispensary, Chhota Simla	Camp Jail, Shahpur	
„ Jai Chandra Malhotra	Camp Jail; Shahpur	Gunjial Dispensary, Shahpur District	Relieving Dr. Jai Singh proceeded on 3 months leave
„ Hakumat Rai	Sohawa Dispensary, Jhelum District	General Duty, Civil Hospital Gujrat	
„ Puran Singh Bhatia		Canal Dispensary, Rajar, Gujrat District	On return from leave
„ Hira Lal Sur	Canal Dispensary, Rajar, Gujrat District	General Duty, Civil Hospital, Gujrat	
„ Sardar Singh		General Duty, Civil Hospital, Gujarat	On return from leave
„ Sardar Singh	General Duty, Civil Hospital, Gujrat	Canal Dispensary, Merala, Sialkote District	
„ Tara Chand Bharadwaj	Dera Gopipur Dispensary, Kangra District	Sub-Charge, Civil Hospital, Sialkote	Relieving Dr. Mir Mohd. Riaz, L.T.M. (Cal), proceeded on 15 days leave
„ Siraj-ud-din Ahmed	Punjab Mental Hospital, Lahore	Alakhpura Dispensary, Hissar District	Relieving Dr. Muhammad Hassan proceeded on one months' leave
„ Daulat Ram Maineratta L.T.M. (Cal).	General Duty, Civil Hospital, Sargodha	Bhagtanwala Dispensary, Shahpur District	Relieving 1st Class Senior Dr. Mul Chand proceeded on two months' leave
„ Fazal Haq Qureshi		Sutlej Valley Project Dispensary, Palla, Multan District	On return from leave
„ Khushal Chand	Vanike Dispensary, Gujranwala District	General Duty, Civil Hospital, Gujranwala	
„ Tara Chand	General Duty, Civil Hospital Jhelum	Central Jail, Lahore	
„ Ved Vias Bedi		Canal Dispensary, Lehal, Ambala District	On return from leave the unexpired portion of which is cancelled
„ Lachhman Das	Canal Dispensary, Lehal, Ambala District	Kot Khai Dispensary, Simla District	
„ Manohar Lal	General Duty, Civil Hospital Karnal	Canal Dispensary, Sirsa, Hissar District	
„ Hari Singh Mahindra		Jaijon Dispensary, Hoshiarpur District	On expiry of leave
„ Rajindar Nath	General Duty, Kaithal Dispensary, Karnal District	Canal Dispensary, Narnaund, Hissar District	
„ Ram Bhaj Madan	Mankera Dispensary, Mianwali District	General Duty, Civil Hospital, Multan	

Name of Sub-Assistant Surgeon	Posting or Transfer		Remarks
	From	To	
.. Aldur Rahman Khan		General Duty, Civil Hospital, Gurdaspur	On expiry of leave
.. Banwari Lal Nayar, M.B., B.S., L.T.M. (Cal).	General Duty, Civil Hospital, Gojra, Lyallpur District	Tanda Dispensary, Hoshiarpur District	
.. Nur Muhammad		General Duty, Civil Hospital, Jullundur	On expiry of leave
.. Vir Bhan Chawla	General Duty, Civil Hospital Gojra, Lyallpur District	Daudkhel Dispensary, Mianwali District	
.. Kirpa Ram Bhasin		Canal Dispensary, Kila Ram Gujranwala District	On return from leave the unexpired portion of which is cancelled
.. Vaishno Das	Canal Dispensary, Kila Ram Kaur, Gujranwala District	General Duty, Civil Hospital, Gujranwala	
.. Parmeshwar Singh Sodhi	General Duty, Civil Hospital, Gidderbaha, Ferozepore District	General Duty, Civil Hospital, Ferozepore	
.. Ram Chand	Guru Harshni Dispensary, Ferozepore District	General Duty, Civil Hospital, Ferozepore	
.. Diwon Chand 1st class Senior	General Duty, Civil Hospital, Sialkote	Toba Tek Singh Dispensary, Lyallpur District	
.. Amar Das Kohli	General Duty, Mayo Hospital, Lahore	General Duty, Punjab Dental Hospital Lahore	
.. Bahadur Chand Setia	Canal Dispensary, Meral, Sialkote District	Jhabran Dispensary, Sheikhupura District	
.. Ishar Das	General Duty, Civil Hospital, Lyallpur	Canal Dispensary, Naiwala, Montgomery District	Relieving Dr. Gopal Chandra proceeded on 4 months leave
Dr. Gian Chand Soni	Daud Khel Dispensary, Mianwali District	Doma il Dispensary Attock District	
.. Balmokand	General Duty, Punjab Dental Hospital, Lahore	Jail and Police Hospitals, Gujranwala	
.. Sewa Singh	Jhabran Dispensary, Sheikhupura District	General Duty, Civil Hospital, Campbellpur	
.. Hira Lal Sur	General Duty, Civil Hospital Gujrat	Mandi Baha-ud-Din Dispensary, Gujrat District	Relieving Dr. Ram Gopal Bhatla proceeded on 4 months leave
.. Mathra Das, 2nd Class Senior		Canal Dispensary, Munak, Kannal District	On return from leave

Name of Sub-Assistant Surgeon	Post or Transfer		Remarks
	From	To	
.. Sri Niwas Rampal	Canal Dispensary, Munak, Karnal District	Asandh Dispensary in the same district	Relieving Dr. Saleh Mohammad proceeded on 4 months leave
.. Shiv Das	General Duty, Civil Hospital, Jullundur	Police Hospital, Ludhiana	
.. Rattan Singh Dhami	Kamar Mashani Dispensary, Mianwali District	Sadhaura Dispensary, Ambala District	
.. Ram Lal Gulati	Sadhaura Dispensary, Ambala District	Kalka Dispensary in the same district	
.. Mangal Singh 1st Class Senior	Toba Tek Singh Dispensary, Lyallpur District	Chichawatni Dispensary, Montgomery District	Relieving Dr. Narain Das Kohli, M.S.M.F. (Pb), appointed Assistant Surgeon in the P.C.M.S.
.. Amar Nath Khosla	Tanda Dispensary, Hoshiarpur District	Shahkot Dispensary, Jullundur District	
.. Shamsheer Singh		Badli Dispensary, Ferozepore District	On return from leave
.. Gian Chand Blaggana, 2nd Class Senior		General Duty, Civil Hospital, Amritsar	On expiry of leave
.. Jugal Kishore Loomba	Canal Dispensary, Narnaund, Hissar District	Pinangwan Dispensary, Gurgaon District	
.. Girdhari Lal	Canal Dispensary, Sirsa, Hissar District	Adampur Dispensary, Jullundur District	
.. Balmukand Nehrau	Adampur Dispensary, Jullundur District	Raikot Dispensary, Ludhiana District	

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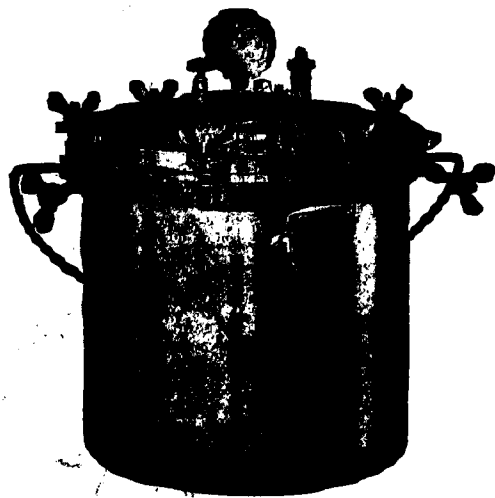
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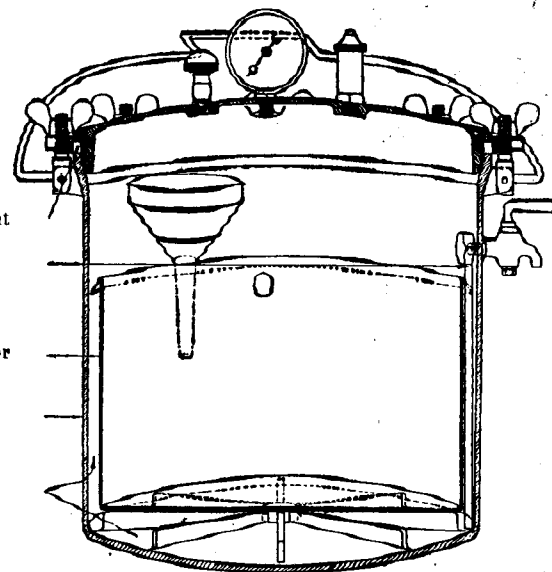
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