

## Summary of the Cases.

Number.	Age.	Sex.	Disease.	Date of operation.	Result.	REMARKS.
1	20	Male.	Tabes mesenterica ..	3-4-25	Improved ..	Later died of pulmonary tuberculosis.
2	40	Male.	Tubercular diarrhœa ..	30-7-24	Apparently Cured	....
3	8	Female child.	Tubercular peritonitis ..	27-1-25	Greatly improved	Apparently well.
4	42	Male.	Tabes mesenterica ..	15-4-25	Improved ..	Returned to work.
5	23	Male.	Tubercular peritonitis ..	13-3-25	Greatly improved	} Invalidated By permission of Captain H. Williamson, F.R.C.S.E., I.M.S.
6	20	Male.	Tabes mesenterica ..	18-3-25	Greatly improved	

1925, and oxygen was given intra-abdominally. The mesenteric glands which were palpable became small but the patient died later from the effects of general tuberculosis.

*Case 2.*—A Hindu male, aged 40, was admitted into hospital on 5th July, 1924. On examination it was discovered that he suffered from diarrhœa which was very obstinate and not amenable to any drug treatment. On further investigation it was found to be of tubercular origin. He was operated upon on 30th July, 1924, and oxygen was inflated into his abdomen by Lieut.-Col. L. E. Gilbert, I.M.S. Soon after the operation he began to improve, the stools became fewer and fewer till finally he was cured and discharged from hospital on 26th August, 1924.

*Case 3.*—A Hindu Tamil, female child, aged 8 years, was admitted into hospital on 7th January, 1925, in a very emaciated condition with a hectic temperature, signs of pulmonary tuberculosis and chronic peritonitis with a small amount of free fluid in the abdomen. Oxygen was pumped into her abdomen on 27th January, 1925, after which she was able to walk about, the fever subsided, appetite increased, and her general condition improved. She was discharged cured, on 8th March, 1925, and is now a frequent visitor to the hospital.

*Case 4.*—An Indian Hindu male, aged 42, was admitted into hospital on 13th April, 1925, with tabes mesenterica and general debility. On 15th April, 1925, he was given oxygen intra-abdominally. Three days later his fever subsided, appetite increased, and general health improved. He gained in weight and is now well and back at work.

*Case 5.*—A European male, aged 23, was admitted into hospital on 21st February, 1924, for the treatment of enlarged glands of the right groin and pyrexia. The temperature continued and the glands became soft and finally had to be aspirated and yellow pus drawn. His blood was examined thrice for malarial parasites with negative results. The case was diagnosed as one of tubercle of the lung and peritoneum. During his stay in hospital he had an attack of hæmoptysis and complained of general pain in the abdomen which was soft and doughy. He had seven motions of a pale colour on 12th March, 1924. On 13th March, 1924, he was operated on and oxygen was inflated into his abdomen. On 16th March, 1924, his temperature became normal, pulse improved, and—above all—abdominal pain and diarrhœa ceased. After this he continued to improve till he was discharged on 15th July, 1924, and later invalided.

*Case 6.*—A Burman male, aged 20, was admitted into hospital on 17th December, 1924. On examination the mesenteric glands were found to be enlarged. On 18th

March, 1925, oxygen was inflated into the abdomen by Capt. H. Williamson, F.R.C.S.E., I.M.S. On 30th March, 1925, his general condition distinctly improved and he was then invalided.

### ACTION OF DISINFECTANTS ON MICROBES: AN INTERESTING PHENOMENON.

By Dr. H. GHOSH, M.B.,

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IN the course of our experiments on acclimatization of bacteria to disinfectants we observed a very interesting phenomenon. We began our work to find out whether by increasing the time of contact of bacteria and disinfectants the rate and extent of growth of the former declined or increased. During the course of this work we found that certain bacteria showed some growth after one hour of contact with a disinfectant but produced no growth after 3 to 5 hours of contact. After 24 or 48 hours of contact, however, a few colonies appeared at first but gradually the number increased as the time of contact was increased. Before entering into further discussion on this phenomenon and its explanation we should describe the technique which we followed.

*Technique.*—A twenty-four hours' culture of a certain bacteria in broth was taken and different dilutions of a certain disinfectant were made in that broth culture. These were then kept in the incubator and after 1, 3, 5, 24, 48, 72 and 96 hours respectively, 0.1 c.c. from each of the dilutions was inoculated on to an agar plate. These plates were examined after 24 and 48 hours of incubation and colonies identified and counted. In our experiments we used *B. pyocyaneus*, *B. proteus* (X19), *S. aureus*, *B. coli*, *V. cholera*, *B. dysentericus* (Shiga) and the disinfectants used were iodine (in KI) solution, potassium permanganate, optochin and sublimate.

*Experimental Findings.*—We observed in this way that up to a certain concentration of the disinfectants the microbes were actually killed, but in certain dilutions (vide curve), while there was

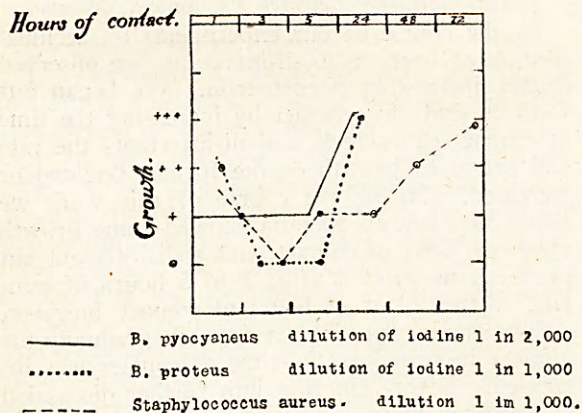


absolutely no growth whatsoever up to 5 hours of contact, colonies appeared after 24 or 48 hours of contact. The number at first being a few increased as the time of contact was increased up to a certain limit. It was also noticed that in 1 to 5 hours of contact there were only a few colonies which, as the time of contact was allowed to increase, became innumerable. In the latter case it was no doubt due to acclimatisation of the microbe.

In the accompanying charts we have indicated the dilutions in which the growth increased from a few to innumerable colonies or from none to many. To determine the phenomenon of acclimatisation we made dilutions of the disinfectants in bouillon of the highest concentration in which there was growth, and then inoculated the acclimatised bacteria in one tube and the non-acclimatised bacteria of the same strain in another. We repeatedly found that there was growth of the acclimatised bacteria, whilst there was absolutely no growth of the non-acclimatised bacteria.

*Explanation of Charts.—Chart No. I.*—It can be seen that in chart No. I. *B. pyocyaneus*, in dilutions of 1|2000 of iodine, shows very slight growth after 1, 3, or 5 hours of contact, but after 24 hours the growth increases. In the case of

CHART I.



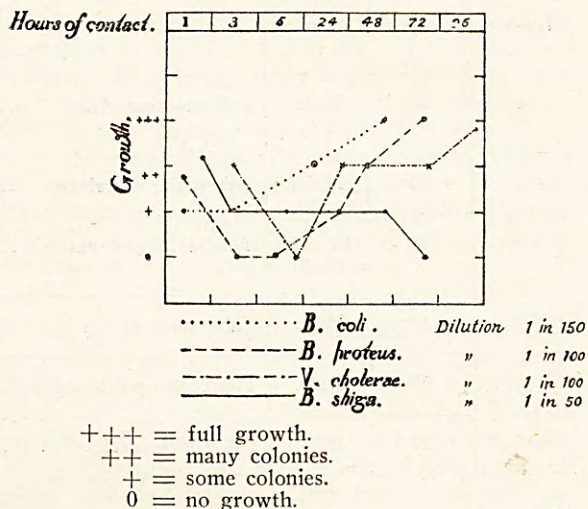
+++ = full growth.  
 ++ = many colonies.  
 + = some colonies.  
 0 = no growth.

*N.B.*—Up to dilution 1|500, staphylococcus and *B. proteus* die quickly. *B. pyocyaneus* does not grow up to dilution 1 in 1000.

*B. proteus* (X19) there is absolutely no growth after 1, 3, or 5 hours of contact, but in dilutions of 1|1000 of iodine there is full growth after 24 hours. Almost similar results are found in the case of *S. aureus*.

*Chart No. II.*—*B. proteus*, in dilutions of 1|100 of permanganate, does not show any growth after 3 or 5 hours of contact, but after 24 hours of contact colonies begin to appear. Similar results are found in the case of *V. cholerae*. *B. coli* shows a few colonies at first, but after 24 hours there is abundant growth. *B. dysentericus* (*Shiga*), however, resists the action of disinfect-

CHART II.

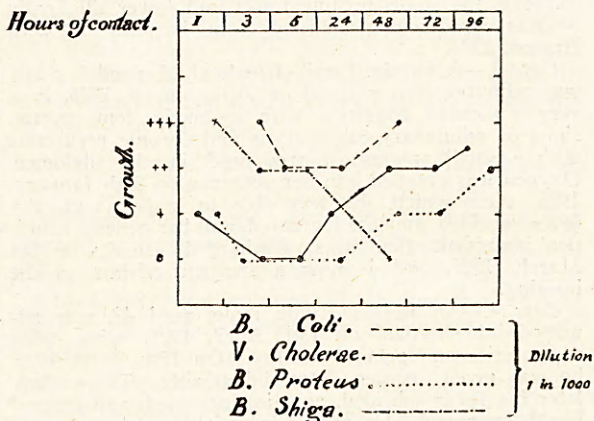


+++ = full growth.  
 ++ = many colonies.  
 + = some colonies.  
 0 = no growth.

ants up till 48 hours of contact, but after that period dies out totally.

*Chart No. III.*—With optochin, in a dilution of 1|1000, *V. cholerae* and *B. proteus* show growth after 24 and 48 hours of contact respectively, while there is no growth after 3 and 5 hours of contact. *B. dysentericus* (*Shiga*) is totally killed

CHART III.



+++ = full growth.  
 ++ = many colonies.  
 + = some colonies.  
 0 = no growth.

*B. shiga* — No growth in stronger dilutions than 1 in 1000. Growth rich in more diluted solution.  
*B. coli* — Growth in 1 in 500 dilution is similar to that of *B. shiga* in 1 in 1000.  
*V. cholerae* — Stronger dilution than 1 in 1000 gives no growth.  
*B. proteus* — Same as *V. cholerae*.

by the above dilution of optochin. In the case of *B. coli* the growth diminishes up till 24 hours of contact, but after that period there is an increase of growth.

*Explanation of the Phenomenon.*—The interesting point in the experiment is that the microbes seem to be killed by a certain dilution of the disinfectant up to the first 5 hours of contact but divide and multiply when placed in fresh medium



after 24 hours. We haven't any means by which we can find out the state of the microbes in the disinfectant solution during the period when they are unable to multiply, consequently we are unable to put forward a definite explanation. We may be permitted, however, to suggest an explanation that probably most of the microbes are killed by the disinfectant effect of the chemicals used; others more resistant get attenuated and lose the power of division and multiplication for a certain period,—during which time they show no growth even when placed in fresh medium. This period may be called a period of shock to the bacteria. Later, as the time of contact increases, this condition of shock passes off and they adapt themselves to the environment and begin to multiply again, and on inoculation into new medium show abundant growth.

### “STIBOSAN” (VON HEYDEN “471”) IN PRIVATE PRACTICE.

By SUDHIR KUMAR DAS, M.B., D.T.M. (Cal.),  
Calcutta.

WHILE I was a student in the Calcutta School of Tropical Medicine I was much impressed by the results obtained from the use of von Heyden “471” in the treatment of kala-azar in the wards of the Carmichael Hospital for Tropical Diseases.

With my former experience with other antimony compounds I can say that “471” is much better, perhaps the best, of all antimony compounds that are now available in the market.

I have put the results I obtained in my cases into tabular form for the convenience of readers; the points that struck me most with regard to the compound are:—

(1) The rapidity with which it checks the fever. In my series of cases the average number of injections required to check the fever was three.

(2) The short duration of the treatment; thus the patient is invalided for a short period only.

(3) The rapid reduction in the size of the spleen. The spleen at first becomes thinned out, then diminishes in size, and from the fifth injection reduces very rapidly.

(4) No untoward effects noted. In my cases no vomiting occurred after injection, not even after meals, and no pulmonary complications occurred.

In all my cases the clinical diagnosis was confirmed by the aldehyde test which was strongly positive in every case. The cure\* of the cases is judged by the fact that since the course of injections was finished none of them have had any return of fever. After the injections they rapidly gained weight.

TABULAR STATEMENT OF THE CASES.

Case No.	Age.	Sex and religion.	Condition at the beginning of treatment.	Duration (in months) of disease prior to treatment.	No. of injections to final disappearance of fever.	Total No. of injections given.	Total amount (in grms.) of compound given.	Period of treatment (in days).	SIZE OF SPLEEN.		Period (in months) elapsed since last injection.	Present condition.
									At beginning of treatment.	At completion of treatment (in inches below costal margin).		
1	46	E. F.	poor	9	5	10	2.85	22	4	P.	14	All the patients are enjoying sound health.
2	19	H. M.	poor	6	3	10	2.9	26	5½	1	14	
3	40	H. M.	fair	8	5	9	2.6	20	6	1½	14	
4	7	H. M.	fair	3	6	11	1.52	24	4	1	9	
5	12	H. F.	poor	3	3	14	2.08	28	4½	1½	9	
6	29	H. M.	poor	6	3	9	2.48	23	5	1	9	
7	17	H. F.	fair	7	3	10	2.9	22	5½	2	9	
8	22	H. F.	poor	8	3	10	2.84	24	5½	2½	8	
9	39	H. M.	poor	12	2	8	2.3	17	3	P.	7	
10	24	E. F.	poor	9	3	8	2.1	18	8	2	6	
11	14	H. M.	fair	6		8	2	32	3½	P.	3	
12	35	H. F.	poor	10	4	10	2.9	29	5	1	3	

E. F. = European female. H. M. = Hindu male.  
P. = Palpable but not protruding below costal margin.

H. F. = Hindu female.

I decided to try this compound on private patients so asked Dr. Napier for a quantity of it; he very kindly supplied me with a sufficient quantity to treat three patients. Later on I obtained the drug direct from the firm of von Heyden; it is now available from their agents in India,—Messrs. Allen & Hanburys.

Two of my cases deserve separate mention here. In case 1 the patient had been suffering from piles, heart trouble (a systolic bruit in the mitral

\* Spleen puncture is not popular in private practice so this method of testing cure was not attempted.

Blood culture, I am told by Dr. Napier, is quite valueless as a means of testing cure.