

glycosuria cases indicated that 99 per cent. were cases of Renal Glycosuria and 1 per cent. of Pancreatic Glycosuria. These Renal Glycosuria cases revealed a low Ca and Vitamin C content in blood although the non-protein nitrogen content was normal. In these cases the percentage of urea in the urine was also found to be within the average normal limits. Administration of suitable doses of calcium and Vitamin C caused a disappearance of glucose from the urine.

Further investigations are in progress.

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BACTERIOLOGICAL EXAMINATION OF BLOOD, STOOLS AND URINE OF SUSPECTED CASES OF TYPHOID FEVER*

IN the course of an epidemiological investigation of typhoid fever in Bangalore City, an

examination of the blood, stools and urine in such of those cases where the diagnosis was inconclusive has been carried out. Whole blood was cultured only in those cases that were traced in the first or second week of infection; in the other cases culture of the stools, urine, the widal test and clot cultures were done.

Salenite F. was used as a primary enrichment media for the typhoid group of organisms, the stools and urine being directly inoculated on this media in the field before being sent to the laboratory. Brilliant green bile broth, eosin-methylene blue and Wilson and Blair (Difco Company) were adopted for the final isolation of the organisms.

Blood Culture.—Seventy-eight samples of blood were examined as given in Table I.

Table I shows that in the 16 samples taken in the second week of infection from patients clinically diagnosed as typhoid, the blood culture was positive in 9 or, 56.2 per cent. of the cases. The remaining 3 samples taken in the third week were negative. Of these 9 positive cultures, 6 were positive for

TABLE I

Bacteriological and Serological Analysis of Blood

Nature of Culture	Total Number Examined	Clinically diagnosed as typhoid	Clinically Definite Cases Days after Onset								Number Positive		
			0-7 days		7-14 days		14-21 days		After 21 days				
			Specimens	No. Pos.	Specimens	No. Pos.	Specimens	No. Pos.	Specimens	No. Pos.	T	A	B
Whole Blood Culture	29	19	0	0	16	9	3	0	0	0	6	3	—
Clot Culture	9	6	0	0	1	0	2	0	3	0	—	—	—
Widal	40	25	1	1	16	14	3	1	5	5	17	—	4†

† Positive also for *B. typhosus*.

* The author is grateful to the Director of Public Health, the Health Officer, Bangalore City, the Medical Officers of the Victoria and Vani Vilas Hospitals and to the Superintendent, Bureau of Epidemiology, for valuable help rendered by them during the course of this investigation.

B. typhosus, 3 for *B. para-typhosus* A, and none for *B. para-typhosus* B.

It may be noted that out of these 9 positives 4 samples had been obtained from those who had developed the infection after inoculation with T.A.B. vaccine, and one from a patient

who was having a second attack of typhoid in 1938 (the first attack being in 1936). In all these cases since the widal test by itself was of no diagnostic significance, culture of the whole blood was of special value in establishing a definite diagnosis of typhoid.

Clot Culture.—Of the 9 samples examined 6 were clinically diagnosed as typhoid. One clot culture was made in the second week, 2 in the third week and 3 in the fourth week. All these clot cultures gave negative results.

Widal Test.—This was carried out on 40 samples of blood, 25 of which were clinically cases of typhoid. Of these 17 were positive for *B. typhosus* and 4 both for *B. typhosus* and *B. para-typhosus B*.

In cases clinically diagnosed as pneumonia, malaria, tumour of the brain, pulmonary or abdominal tuberculosis, or some allied disease,

isms possibly shoots up so high that we get positive widal in diagnostic titres. It seems therefore, necessary to determine what the natural level of agglutinins for the typhoid group of organisms is amongst random samples of the population in Bangalore City before fixing up the titre for diagnostic purposes. For instance in Bombay City, on the basis of such an investigation minimum titre for diagnostic purpose has been fixed up for *B. typhosus* as 1-250 (formalised suspension) and 1-125 for *H. agglutination*; for *Para A* and *B* infection the titre fixed up is 1:25.

Stool Culture.—Of the 103 samples cultured, in seven cases, the specimens from the same patient had been examined twice at a week's or fortnight's interval. The bacteriological analysis of the remaining 96 samples is given in Table II.

TABLE II
Bacteriological Analysis of Stools and Urine

Specimen	Total No.	Clinically diagnosed as typhoid	Days after Onset in Clinically Definite Cases								Positive Biochemically and Serologically				Positive only Biochemically			
			0-7 days		7-14 days		14-21 days		After 21 days		T	A	B	Total	T	A	B	Total
			No. Exam.	No. Pos.	No. Exam.	No. Pos.	No. Exam.	No. Pos.	No. Exam.	No. Pos.								
Stools	96	65	1	0	26	14	24	9	14	9	17	2	2	21	5	1	5	11
Urine	48	42	1	0	23	4	9	4	9	0	6	—	—	6	2	—	—	2

the widal was definitely positive particularly for the para-typhoid group of organisms. In none of these cases was there any history of the patient having suffered from typhoid at any time before or having been recently inoculated with T.A.B. vaccine. In a place like Bangalore where typhoid infection has been prevalent for many years it is likely that a large proportion of the population have suffered from comparatively mild infections as a result of which their blood would contain the specific typhoid agglutinins.

When such people get high fever due to causes other than typhoid, owing to anamnestic reaction, the titre for typhoid group of organ-

Of the specimens of stools cultured from 65 clinically definite cases, 17 proved positive for *B. typhosus*, 2 for *B. para-typhosus A* and 2 for *B. para-typhosus B*. In these cases, in addition to getting typical biochemical reactions, the isolated culture was agglutinable by the specific standard high titre sera and in six cases by the patient's serum also. In 11 cases, however, the isolated culture gave typical biochemical reaction but was not agglutinable by the specific high titre sera.

In a few clinically typical cases of typhoid fever, in which the typhoid group of organisms could not be isolated on culture of the stools, blood or urine, some of the non-typhoid group

of organisms like *Proteus morgani*, *Pseudomonas pyocyaneus*, *Bacterium faecolis alkaligenes*, and a few other strains with a typical biochemical or serological reactions were isolated. The possible association of these organisms in the causation of continuous fever required further investigation.

Urine Culture.—During the investigation 50 samples of urine from cases of continuous fever were cultured. Out of these, in two cases the same specimen was examined twice at about a week's interval. The results of analysis of the remaining 48 samples are given in Table II.

Out of clinically definite cases of typhoid, *B. typhosus* was isolated in 6 cases, the paratyphoid group of organisms not being isolated in any of them.

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**THE FATTY OIL FROM THE SEEDS
OF *MALLOTUS PHILIPPINENSIS*,
MUELL. ARG. (NATURAL ORDER
EUPHORBIACEÆ)**

The seeds of *Mallotus philippinensis* (commonly known as *Monkey face tree* in English and *Kamala* in Hindustani) on extraction with benzene yielded a thick, transparent light brown oil of drying character. The physical and chemical constants of this oil, which has not so far been investigated,¹ have been determined with the following results:—

Yield of oil in kernels—48.8 per cent.; Specific gravity at 33° C./33° C.—0.9333; Refractive index at 34° C.—1.5156; Acid value—11.3; Saponification value—207.6; Iodine value—157.3; Acetyl value—46.8; Hehner value—96.1; Unsaponifiable matter—1.9 per cent.

A detailed examination of the constituent acids of this oil is now in progress.

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¹ Brodie, N., *Bull. Indian Ind. Research*, No. 10, *Indian Vegetable Oils*, 1937, p. 33.

CONSTITUTION OF HIBISCETIN

THE hydroxy flavonol, hibiscetin obtained from the flowers of *Hibiscus sabdariffa*, was shown to be 3:5:7:8:3':4':5'-heptahydroxy flavone from a study of its reactions and of the degradation products.¹ This structure has now been confirmed by the synthesis of its methyl ether according to the method of Allan and Robinson.² 2:4-dihydroxy- ω :3:6-trimethoxy acetophenone has been condensed with trimethyl gallic anhydride and anhydrous sodium trimethyl gallate to produce 7-hydroxy-3:5:8:3':4':5'-hexamethoxy flavone, which on subsequent methylation has yielded 3:5:7:8:3':4':5'-heptamethoxy flavone. This methyl ether agrees in all respects with heptamethyl hibiscetin. Experiments on demethylation to yield hibiscetin itself have yet to be carried out.

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August 5, 1942.

¹ Suryaprakasa Rao and Seshalri, *Proc. Ind. Acad. Sci. (A)*, 1942, 15, 148.

² Allan and Robinson, *J.C.S.*, 1924, 2192.

**PHENYLHYDRAZINE ANÆMIA IN
RATS**

IN the search for a simple method for making experimental animals anæmic for the study of the hæmopoietic action of amino-acids, it was decided to investigate the possibility of using phenylhydrazine. This substance has long been known to have a destructive action on the red blood cells, a fact which has found therapeutic application in the treatment of polycythemia vera, a disorder in which the blood contains an abnormally high proportion of erythrocytes. Apart from ascertaining the conditions under which experimental anæmia could be induced in rats by injection of phenylhydrazine it was found necessary to study the blood picture of such animals in some detail as certain authors claim to have observed an increase in blood concentration due to fluid loss in poisoning by hydrazine and its derivatives [cf. Underhill and Karelitz¹ (1923), Bondansky² (1924)]. In careful experiments on rabbits