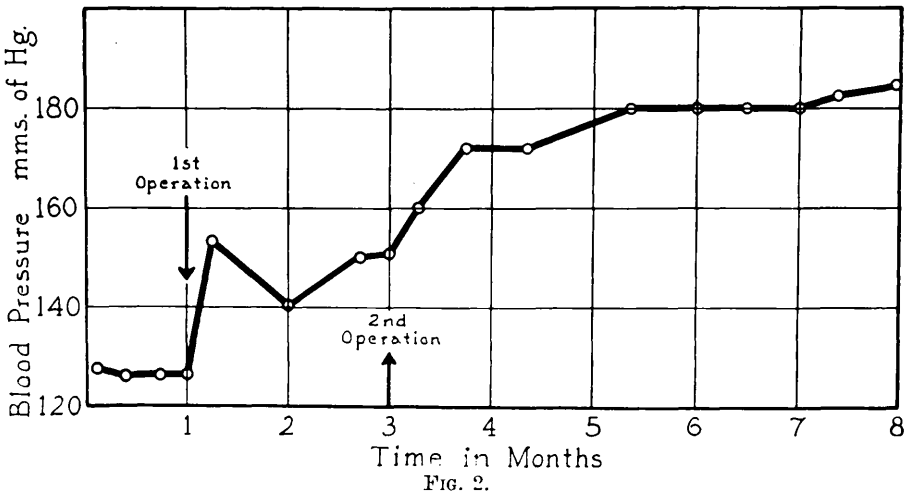

FIG. 2.

The blood pressure of a dog following compression of the kidneys. At ↓ the right kidney was compressed; at ↑, the left was similarly treated. The mean pressures as determined by direct arterial puncture and measured on a mercury manometer are given as ordinates.

If a rapidly developing hypertension is desired, the second kidney may be compressed or removed about 10 days after the first operation. Many animals thus treated will develop a rapidly progressive malignant hypertension.

In Fig. 2 is shown a typical response of the blood pressure of a dog to the bilateral compression of the kidneys. One year following the first operation, the blood pressure had gradually risen to 200 mm Hg., at which level it remained during the next 8 months during which the animal was under observation.

Summary. A relatively simple and easily applicable procedure is described for inducing chronic hypertension in the mouse, rat, rabbit, dog, or other laboratory mammal. The method in our experience results in a higher percentage of chronically hypertensive animals, is simpler in application than the procedures involving constriction of the renal artery or the application of silk or cellophane to the kidney, and is less apt to result in an interference with the renal excretory function or the development of a rapidly fatal malignant form of hypertension.

14714

Salmonella loma-linda: A New Type Isolated from Meningitis.*

P. R. EDWARDS.

From the Department of Animal Pathology, Kentucky Agricultural Experiment Station, Lexington, Ky.

Salmonella loma-linda was isolated by Dr. T. F. Judefind of the College of Medical Evangelists, Loma Linda, California, from the spinal fluid of a baby that died of meningitis. The clinical and pathological aspects of the infection will be described by Dr. Judefind and his associates who recognized the organism as an unusual Salmonella type. The organism was a motile bacillus which possessed the usual cultural and biochemical

* The investigation reported in this paper is in connection with a project of the Kentucky Agricultural Experiment Station and is published by permission of the Director.

TABLE I.
Characteristics of Phase 2 of *S. loma-linda* and of *S. durban*.

Antigens	Serums: *S. abortus equi* (e,n,x . . .) Absorbed by *S. loma-linda* phase 2	*S. abortus equi* (e,n,x . . .) Absorbed by *S. durban* phase 2	*S. glostrup* Phase 2 (e,n,z_{15} . . .) Absorbed by *S. loma-linda* phase 2	*S. glostrup* Phase 2 (e,n,z_{15} . . .) Absorbed by *S. durban* phase 2
S. loma-linda, phase 2	<100	500	<100	<100
S. durban, phase 2	200	<100	500	<100
S. abortus equi (e,n,x . . .)	500	500	500	<100
S. glostrup, phase 2 (e,n,z_{15} . . .)	200	<100	500	<100
S. abortus bovis, phase 2 (e,n,x . . .)	<100	200	<100	<100

attributes of the Salmonella group. Acid and gas were produced from glucose, arabinose, xylose, rhamnose, maltose, trehalose, mannitol, and sorbitol. No fermentation of lactose, sucrose, dulcitol, inositol, or salicin was observed. Citrate and mucate were utilized, but dextro-tartrate, levo-tartrate and meso-tartrate were not attacked. The bacillus produced hydrogen sulfide but did not form indol nor liquefy gelatin.

On serological examination the organism proved to be diphasic and its antigens were represented by the formula IX, XII:a-e,n,x . . . This is the formula attributed to *S. durban* by Henning, Rhodes, and Gordon-Johnstone.[1] However, a transplant of the original culture of *S. durban* received from Dr. Henning was found by the writer to have the formula IX,XII:a-e,n,z_{15} . . . Kauffmann[2] also found that *S. durban* was represented by the latter formula. Since *S. loma-linda* and *S. durban* were so closely related, a comparative study of two types was undertaken. The following differences were observed: Whereas *S. loma-linda* was unable or utilize either *d*- or *l*-tartrate, both were readily attacked by *S. durban*. While *S. loma-linda* did not attack dulcitol during 30 days incubation, *S. durban* produced acid and gas from the substance in 24 hours. Both cultures completely removed agglutinins from *S. gallinarum* serum and therefore have somatic antigens IX, XII. Phase 1 of both organisms was flocculated in high dilution by serum derived from *S. paratyphi* A and is represented by the symbol a. However the 2 phases are not identical since *S. loma-linda* effected a complete removal of H agglutinins from the serum while *S. durban* did not. The failure of *S. durban* to remove all H. agglutinins from *S. paratyphi* A serum was noted by Henning, Rhodes, and Gordon-Johnstone.

Examination of phase 2 of the 2 cultures revealed differences of diagnostic value. Both were flocculated by e,n,x . . . and e,n,z_{15} . . . serums. When tested with single factor x and z_{15} serums *S. loma-linda* was flocculated readily by x serum but was unaffected by z_{15} serum. On the contrary *S. durban* did not react with x serum but was agglutinated by z_{15} serum. The results of absorption tests with the 2 phases are given in Table I. It is quite apparent that phase 2 of *S. durban* is synonymous with phase 2 of *S. glostrup* and contains the antigens e,n,z_{15} . . . While phase 2 of *S. loma-linda* is not identical with that of *S. abortus equi*, it resembles that of *S. abortus bovis*. Kauffmann[3] stated that phase 2 of *S. abortus bovis* was identical with phase 2 of *S. abortus equi* but Edwards and Bruner[4] demonstrated that distinct differences existed in the e,n,x . . . phases and that phase 2 of *S. abortus bovis* lacked certain antigens found in *S. abortus equi*. The antigens of phase 2 of *S. loma-linda* are e,n,x . . .

[1] Henning, M. W., Rhodes, F. W., and Gordon-Johnstone, J., *Onderstepoort J. Vet. Sci. and An. Ind.*, 1941, **16**, 103.

[2] Kauffmann, F., *Acta. path. et microbiol. Scand.*, 1942, **19**, 523.

[3] Kauffmann, F., *Acta. path. et microbiol. Scand.*, 1940, **17**, 1.

[4] Edwards, P. R., and Bruner, D. W., *J. Inf. Dis.*, 1941, **69**, 220.

Summary. A new Salmonella type, *S. lomalinda,* was described. The culture was represented by the antigenic formula IX,XII: a-e,n,x . . . This formula was erroneously attributed to *S. durban,* which in reality possesses antigens IX,XII:a-e,n,z_{15} . . . The two types presented biochemical as well as antigenic differences.

14715

Tuberculostatic Action of Phenothiazine and Derivatives.*

B. L. FREEDLANDER. (Introduced by S. C. Freed.)

From the Harold Brunn Research Institute, Mount Zion Hospital, San Francisco, Calif.

Phenothiazine has been proposed as an insecticide, fungicide, anthelmintic, and urinary antiseptic.[1,2] Many phenothiazine derivatives, such as methylene blue, Lauth's violet, phenothiazone, and thionol form oxidation-reduction systems. Phenothiazine, after absorption in the body, is excreted partly in the oxidized forms of phenothiazone and thionol, as well as in their respective leuko forms, with which they form oxidation-reduction systems.[3] Exposure of phenothiazine to air and light results in oxidation to phenothiazone and possibly to thionol, in which forms they become more active as fungicides. In the following experiments this interesting group of compounds was tested for bacteriostatic effect on the growth of tubercle bacilli *in vitro.*

I. The bacteriostatic action of phenothiazine was tested on the highly virulent strain of tubercle bacilli, H37Rv. Proskauer and Beck liquid synthetic asparagin media, pH 7.2, was used. Phenothiazine was dissolved in propylene glycol to make a 1% solution. Subsequent dilutions were made directly into the media. Appearance of a pellicle at the end of 3 weeks was taken as the criterion of growth. The highest dilution at which bacteriostatic action occurred was 1:1,000,000.

II. Phenothiazine and 15 derivatives were tested for tuberculostatic action on an avirulent Novy strain of tubercle bacilli. This culture normally produces a heavy surface growth within 4 days. Most of the chemical compounds were dissolved in propylene glycol. Methylene blue and Lauth's violet were dissolved in distilled water. The compounds and the results are listed in Table I. The parent compound, phenothiazine, again inhibited growth in concentration of 1:1 million. Phenothiazine sulfate also showed a high bacteriostatic effect in concentration of 1:200,000. The oxidized derivatives, phenothiazone and thionol (Nos. 3 and 4), showed a moderate degree of inhibition, in dilutions of 1:100,000 and 1:80,000 respectively. The *x*-hydroxyphenothiazine, apparently in the oxidized form in solution, gave results comparable with its isomer, phenothiazone. It is of interest that these oxidized forms are less effective than phenothiazine, as the reverse is the case in their inhibiting action on certain fungi. This suggests that either the oxidized forms are less readily absorbed by the tubercle bacilli, or the interference with the metabolism of the tubercle bacilli is of a different type than that of its fungicidal action. The oxidized forms are less soluble in lipids than phenothiazine; this may decrease the ability of these compounds to penetrate the tubercle bacilli in sufficient concentration.

* The present report is part of a cooperative investigation on tuberculosis and has been supported by funds provided by the Committee on Medical Research of the National Tuberculosis Association, the California Tuberculosis Association, and the Rose Lampert Graff Foundation.

1 DeEds, F., Stockton, A. B., and Thomas, J. O., *J. Pharm. and Exp. Therap.,* 1939, **65**, 353.

2 Prelim. Report, Council of Pharm. and Chem., *J. A. M. A.,* 1940, **115**, 1721.

3 DeEds, F., Wilson, R. H., and Thomas, J. O., *J. Pharm. and Exp. Therap., J. A. M. A.,* 1940, **114**, 2095.