

11351 P

Bacteriostatic Action of Various Wetting Agents upon Growth of Tubercle Bacilli *in vitro*.*

B. L. FREEDLANDER. (Introduced by Ernest L. Walker.)

From the Department of Medicine, University of California Medical School, the San Francisco Hospital, and San Francisco Department of Public Health.

Wetting agents in general possess the properties of penetrating and emulsifying surface films of fatty substances to a high degree, and are powerful surface tension reducers. For these reasons, it is of interest to observe their action on tubercle bacilli with their enveloping fatty capsule. The bactericidal action of several wetting agents on some organisms have been investigated, but little has been done in testing the effect of these compounds on the growth of tubercle bacilli.

The following compounds were tested for bacteriostatic action: Nacconol NR,† an alkyl aryl sulfonate; Aerosol OT-100, an ester of a sulfonated bi-carboxylic acid; Aerosol OS, a sodium salt of an alkyl naphthalene sulfonic acid; and Zephiran, a mixture of high molecular alkyl-dimethyl-benzyl-ammonium chlorides. All the agents were approximately neutral in solution.

A non-virulent Novy strain of tubercle bacilli was grown on liquid synthetic asparagin media containing 6% glycerin, with pH 7.4. This produces a heavy surface growth in 2 to 3 days. Dilutions of the wetting agents were made in normal saline and added in equal amounts to tubes containing 4.5 cc of media. A large loopful of surface growth of a 3-day culture of tubercle bacilli was inoculated on a cork float in each tube. The tubes were then slanted and incubated at 37°C. Readings of the amount of growth were made at 2-day intervals.

The results are shown in Table I. The most effective wetting agent is Zephiran, which produced complete inhibition of growth in dilution of 1:80,000, and retardation of growth in dilutions as high as 1:400,000. Nacconol NR and Aerosol OT-100 prevented growth in dilution of 1:5,000, and retarded growth in dilution of 1:40,000. Aerosol OS produced the lowest bacteriostatic action,

* This investigation was aided by a grant from the San Francisco Tuberculosis Association.

† Nacconol, a product of the National and Chem. Co.; Aerosol, a product of the Amer. Cyanamid & Chem. Corp.; Zephiran, a product of the Alba Pharmaceutical Co.

TABLE I.
Action of Four Wetting Agents on Growth of Tubercle Bacilli *in vitro*.

Dilution	Growth											
	Zephiran			Nacconol			Aerosol OT-100			Aerosol OS		
	2 days	4 days	6 days	2 days	4 days	6 days	2 days	4 days	6 days	2 days	4 days	6 days
1:1,000	—	—	—	—	—	—	—	—	—	1+	4+	4+
1:5,000	—	—	—	—	—	—	—	—	—	2+	4+	4+
1:10,000	—	—	—	—	1+	2+	—	—	—	2+	4+	4+
1:15,000	—	—	—	—	1+	4+	—	—	—	2+	4+	4+
1:20,000	—	—	—	—	2+	4+	1+	1+	1+	3+	4+	4+
1:40,000	—	—	—	—	3+	4+	2+	2+	2+	—	—	—
1:50,000	—	—	—	—	—	—	—	—	—	—	—	—
1:60,000	—	—	—	—	—	—	—	—	—	—	—	—
1:70,000	—	—	—	—	—	—	—	—	—	—	—	—
1:80,000	—	—	—	—	—	—	—	—	—	—	—	—
1:90,000	1+	1+	3+	—	—	—	—	—	—	—	—	—
1:100,000	1+	1+	3+	—	—	—	—	—	—	—	—	—
1:125,000	1+	2+	4+	—	—	—	—	—	—	—	—	—
1:150,000	1+	3+	4+	—	—	—	—	—	—	—	—	—
1:200,000	1+	3+	4+	—	—	—	—	—	—	—	—	—
1:250,000	2+	4+	4+	—	—	—	—	—	—	—	—	—
1:300,000	2+	4+	4+	—	—	—	—	—	—	—	—	—
1:350,000	2+	4+	4+	—	—	—	—	—	—	—	—	—
1:400,000	2+	4+	4+	—	—	—	—	—	—	—	—	—
1:450,000	3+	4+	4+	—	—	—	—	—	—	—	—	—

Controls: 3+ in 2 days; 4+ in 4 days.

permitting growth in dilution of 1:1,000, and retarding growth slightly in dilution of 1:10,000. The above results are not strictly comparable, as the degree of chemical purity of each of the compounds is unknown.

Although the bacteriostatic action of Zephiran against tubercle bacilli is high, its bactericidal action is low. To 4.5 cc of a 1:1000 dilution of Zephiran was added $\frac{1}{2}$ cc of an undiluted 3-day growth of tubercle bacilli, which previously had been well shaken to break the surface film into small particles. This mixture was incubated at 37°C for $\frac{1}{2}$ hour, then centrifugalized, washed twice with normal saline, and the sediment planted on Lowenstein's egg media. The growth was positive.

The superior bacteriostatic action of Zephiran over that of the other wetting agents is not due entirely to its ability to reduce surface tension or to superior wetting qualities, as these qualities are approximately the same in all the compounds tested. Its superior action is probably inherent in its molecular structure.

11352 P

Functional Transplants of Epithelial Hypophysis in Three Species of Amblystoma.

WAYNE J. ATWELL AND JAMES W. TAFT.

From the Department of Anatomy, University of Buffalo.

Previously it has been shown^{1, 2} that transplantation of the primordium of the epithelial hypophysis, independent of brain and foregut, may be followed by differentiation and function of the transplant in 2 species of frogs, *Rana sylvatica* and *R. pipiens*. Although numerous transplants were attempted with embryos of *Amblystoma punctatum* no unequivocally successful cases were obtained. This seemed to confirm the conclusions previously reached by Blount,³ who held that the epithelial portion of the hypophysis is dependent upon an association with the neural lobe for its differentiation and functioning.

More recently Blount⁴ has presented evidence to show that hypo-

¹ Atwell, W. J., *Proc. Soc. Exp. Biol. and Med.*, 1935, **33**, 224.

² Atwell, W. J., *Anat. Rec.*, 1937, **68**, 431.

³ Blount, R. F., *J. Exp. Zool.*, 1932, **63**, 113.

⁴ Blount, R. F., *Anat. Rec.*, 1939, **73**, Sup. 1, 7.