

sistent change in the proteins during the course of various diseases.

We hope to correlate the spectrographic measurements of total protein changes and relative ratio changes of the protein fractions with the development of immune reactions in the course of disease.

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**Decreased Resistance of Purified Bacteriophages to Disinfectants.**

PAUL J. BEARD. (Introduced by E. W. Schultz.)

*From the Department of Bacteriology and Experimental Pathology, Stanford University, California.*

The surprising resistance of the bacteriophage to action of disinfectants has been commented upon by many observers. Thus d'Herelle<sup>1</sup> states that bacteriophage corpuscles survive 3 days' exposure to 0.5% mercuric chloride in physiological saline. Prausnitz and Firle<sup>2</sup> claim that resistance is above that of anthrax spores. Watanabe<sup>3</sup> noted well defined racial variations in the resistance of 'phages to phenol, 1% for 24 hours being sufficient to destroy some races, while 4% was necessary to inactivate others.

In order to determine whether the organic matter in the lysates exerts any protective action, 3 races of bacteriophage were purified according to the technique of Arnold and Weiss.<sup>4</sup> These purified 'phages gave negative Biuret, Xanthoproteic acid, Millon, Hopkins, Cole and Molisch tests. Non-purified 'phages were adjusted to the same lytic titer and the lysol resistance of both the purified and non-purified suspensions was compared. Tests of each 'phage were made in triplicate at various lysol concentrations. The results of these tests are summarized in the following protocol.

As is seen, the resistance of the 'phage to lysol was in every case markedly decreased. That the lysol solutions did not decrease greatly in activity is evidenced by the fact that after the 24 hour period a 3% concentration killed *B. subtilis* spores in 24 hours.

A decided decrease in the resistance to mercuric chloride was also noted, although accurate quantitative determinations have thus far not yet been made.

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<sup>1</sup> d'Herelle, F., "The Bacteriophage and Its Behavior."

<sup>2</sup> Prausnitz, C., and Frile, E., *Centralbl. f. Bakt., Orig.*, 1924, **xciii**, 148.

<sup>3</sup> Watanabe, T., *Arch. f. Hyg.*, 1923, **xcii**, 1.

<sup>4</sup> Arnold, L., and Weiss, E., *J. Infect. Dis.*, 1925, **xxxvii**, 411.

TABLE I.  
Comparison of Purified and Non-purified 'Phages to Lysol.

% lysol	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6
Normal coli phage	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Pure coli phage	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Normal protein phage	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Pure protein phage	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Normal staph. phage	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Pure staph. phage	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++

+ = Lysin on subculture after 24 hours exposure.  
— = Permanent inactivation.

It was further noted that these purified 'phage suspensions deteriorated rapidly at room temperature. Similar observations have been reported on enzymes stored in the absence of their substrates.