

sunlight- and dye-treated toxin, electric light- and dye-treated toxin or of toxoid in doses and intervals similar to those described above for guinea pigs. Ten days after the last injection it was found that the average amount of toxin that could be neutralized by 1 cc. of serum in 30 minutes at room temperature, was 10 M.L.D. for the animals of the first group, 25 M.L.D. for those of the second group, and 4 M.L.D. for those of the third group.

Traces of residual toxin in the photodynamically treated material were demonstrated by the development of late paralysis in some guinea pigs after having received repeated large doses of the treated toxin. The possibility of this residual toxin being partially responsible for the antigenicity of the detoxified toxin can not be excluded. But in view of the high immunity produced the result is comparable to that obtained by the use of toxoid with the addition of sublethal doses of active toxin.

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Comparison of the Antigenicity of Three Forms of Staphylococcal Toxoid.

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In the preceding report it was shown that staphylococcal toxin after complete detoxification by the photodynamic action of methylene blue still retains its antigenic property. This note records the results of a preliminary study of the antigenic value of this "methylene blue toxoid" in comparison with 2 other common forms.

Materials and methods. (a) A single lot of toxin, No. 9669F, was used for the preparation of the 3 forms of toxoid. Formol-toxoid was prepared with 0.3% formalin. The alum-precipitated formol-toxoid was made by the method of Wells, Graham and Havens.¹ A third portion of toxin was treated with methylene blue, 1:50,000, and exposed to direct sunlight for 3 hours. The 3 toxoids did not hemolyze rabbit-erythrocytes. Immunization and estimation of antigenic response were done as described in the preceding paper.

¹ Wells, Graham and Havens, *Am. J. Pub. Health*, 1932, **22**, 648.

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At each stage the procedures were carried out simultaneously and in identical manner.

TABLE I.

Subcutaneous injections in 0.2 cc. doses	No. of rabbit	Staphylococcal Antitoxin in Sera (Provisional units per cc.)				Local Reac- tion	Dermo- neurotic doses resisted
		End of first week	End of second week	End of third week	End of fourth week		
I. Formol-toxoid							
a. Single dose	74	>0.4	>0.4	>0.4	0.8	+	6.2
	7	>0.4	>0.4	>0.4	>0.4	+	1.6
b. Weekly doses	39	>0.4	1.6	—	—	+	—
	28	>0.4	0.4	16.0	6.4	±	>25
II. Alum ppt. td.							
a. Single dose	67	0.4	1.6	0.8	0.4	++	1.6
	88	3.2	3.2	0.8	1.6	+++	3.1
b. Weekly doses	3	>0.4	1.6	8.0	6.4	++	25-
	44	>0.4	0.8	8.0	3.2	+++	25
III. M.B. toxoid							
a. Single dose	86	>0.4	>0.4	>0.4	>0.4	0	3.1
	92	>0.4	0.8	0.8	>0.4	±	3.1-
b. Weekly doses	4	>0.4	>0.4	6.4	3.2	±	6.2
	77	>0.4	>0.4	3.2	1.6	0	12.5

For local reaction:

0 indicates absence of any apparent reaction.
 ± " slight redness for 1 day.
 + " definite redness for more than 1 day.
 ++ " redness and induration for 3 days.
 +++ " redness, induration and fluctuation.

The results are summarized in Table I. The small number of animals used does not allow a final conclusion. The results suggest that (A) the M. B. toxoid is about as effective as the formol- and alum-precipitated toxoids, and (B) the M. B. toxoid seems to cause less local reaction than the other forms of staphylococcus toxoid studied.