work along these lines. This is especially true in the present experiments on account of the limited number of animals which we were able to study. We may say, however, that rabbits can be rendered allergic to certain streptococcal filtrates by injections of autolyzed guinea pig kidney solution, and that the cutaneous reactions in these rabbits show no specificity for either the scarlatinal or erysipelas groups. The reactions are probably not due to toxin, since reactions are obtained with filtrates which have presumably been heated until atoxic. None of the rabbits studied reacted with broth or with *staphylococcus aureus* filtrates. The reactions with the streptococcus filtrates were always the earliest to appear and were the most prominent of all. They appeared simultaneously with the occurrence of the kidney precipitin. For these reasons we must assume that the filtrates and the kidney solutions contain related allergens possessing some degree of mutual specificity. This is a complete report.

[1] Caronia, G., and Sindoni, M., *La Pediatria*, 1923, xxxi, 14. Di Cristina, G., and Caronia, G., 1925, i, 1. Caronia, G., *La Pediatria*, 1925, xxxiii, 7.

[2] Brokman, H., Fejgin, B., Hirszfeld, H., Meyzner, M., and Przesmycki, F., *Compt. rend. Soc. d. Biol.*, 1925, xciii, 946; *ibid*, 944.

3403

The Reaction of Vesicular Stomatitis Virus to Ultra Violet Light.

PETER K. OLITSKY AND FREDERICK L. GATES.

From the Laboratories of the Rockefeller Institute for Medical Research.

Since bacteriological methods have so far failed to yield direct evidence of the nature of the active agent of vesicular stomatitis of horses, which is classed as a filterable virus disease, we have sought indirect evidence of its character in a comparison of the behavior of this virus with that of a common bacterium, *S. aureus*, under exposure to ultra violet light. The reactions of *S. aureus* to measured amounts of monochromatic energy at various frequencies may be considered typical of the behavior of bacterial protoplasms, and we have used the loss of transmissibility of a fixed vesicular stomatitis virus, active for guinea pigs, and the failure of subsequent colony formation by *S. aureus*, as indices of a similar reaction under ultra violet irradiation.

Active vesicle contents from lesions in the posterior foot pads of guinea pigs was aspirated and diluted 1:10 in buffered peptone broth

at pH 7.4. This fluid, or a suspension of an 18-hour culture of *S. aureus* in the same medium, was spread on the surface of nutrient agar in small Petri plates, and corresponding areas of the respective plates were exposed to measured monochromatic radiations of the quartz mercury arc. After exposure the bacterial plates were incubated and the resulting colonies in the exposed areas were counted, in comparison with those in like areas from the unexposed portions of the plates. Exposed areas and unexposed control areas were cut from the agar of the virus plates, ground up in phosphate buffer solution at pH 7.5, and 0.4 cc. specimens of the virus-agar suspensions were injected intradermally into the posterior pads of guinea pigs. These animals were subsequently examined for the characteristic lesions of vesicular stomatitis, and the diagnoses were later confirmed by immunity tests.

TABLE I.

λ	Incident energy (ergs per mm.²)	*S. aureus* killed per cent.	Vesicular stomatitis virus. Number and reaction of guinea pigs injected with	
			Exposed virus-agar	Unexposed virus-agar (control)
2675	256-270	87-97	3—, 1+	
	512-540	100	5—	5+
3022	23,300—	97—		
	29,900	100	4—	4+
3126	32,200—	No visible	3+, 1—	4+
	60,400	effect		

The table shows the results of our experiments. λ 2675 is highly bactericidal and shows a corresponding effect on the transmissibility of vesicular stomatitis virus. λ 3022 is within the bactericidal region of the spectrum, though large incident energies are required, corresponding to a relatively low coefficient of absorption of this wave length by bacterial protoplasm. These large incident energies cause a loss of virus transmissibility also. λ 3126 is on the border line of bactericidal ultra violet radiations, and has a questionable effect on the virus. Thus a suggestive similarity is seen in the effects of ultra violet light on the transmissibility of vesicular stomatitis virus and on the death or survival of *S. aureus*. Since the absorption of specific energies is one index of chemical character, and in this instance results in similar effects, these parallel reactions are indirect but suggestive evidence that the substance of the virus is similar in character and chemical constitution to bacterial protoplasm.