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Reaction of the Rabbit to Vaccine Virus.

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Little information is available regarding the clinical reaction of the rabbit to cutaneous inoculation of dermo-vaccine virus except as regards the local reaction at the site of injection. Furthermore, factors which presumably might affect the response as, for example, age, have not generally been considered. Our interest in the matter arose from the results obtained in the vaccination of the rabbits of a large breeding colony. The experiments are still in progress but enough has been learned to show that the clinical reaction of the rabbit to vaccination is extremely variable and that these variations are associated with a number of factors which concern the host.

Approximately 1800 rabbits were vaccinated in December, 1933, and January, 1934, with culture dermo-vaccine virus obtained through the kindness of Dr. T. M. Rivers. The injections were made intracutaneously with dilutions ranging from 1:50 to 1:40,000. Previous tests had shown that the virus was active in a titre of 1:100,000 to 1:1,000,000 injected intradermally. Certain outstanding results of the experiments may be briefly summarized as follows.

A typical local reaction developed in the adult non-immune stock of both sexes but it was much more severe in bucks than in does, and more pronounced in resting than in pregnant and nursing does. Generalized manifestations consisting in particular of a cutaneous maculo-papular eruption in areas remote from the injection site, as for example, the ears, were not infrequent. A lymph adenitis was also observed and an orchitis in male animals developed in many instances. There were a few cases of pronounced illness and prostration but only 3 fatalities.

The results were quite different in the younger stock, all of which

were presumably susceptible. In the first place, a local reaction did not develop in a large proportion of these rabbits and the incidence of negative results was inversely proportional to age. Certain of these rabbits 1 to 7 days old, moreover, received much larger doses than the adults. Secondly, there was an unexpected high incidence of generalized clinical manifestations remote from the local injection site and surrounding shaved area. A maculo-papular or papular eruption highly variable in distribution, extent, and number of individual lesions, an adenitis, a conjunctivitis and other eye symptoms, an involvement of the nasal passages and sinuses, and intestinal disturbances were among the clinical features observed. Many of these animals were obviously ill and a considerable number of them died; others, however, recovered. Although generalized signs and symptoms occurred in animals in which a local vaccination reaction developed, it was noteworthy that the majority of the cases were in rabbits in which no local reaction of any kind had been detected. Another feature of interest was the occurrence of a relapse of generalized lesions in an occasional animal. In one case, no lesions could be found for 2 weeks and then there developed a fresh crop of typical papules. There were also a number of fatal cases in which no clinical signs of the disease had been observed prior to death but in which postmortem examination revealed typical vaccinal lesions of the viscera. Certain of these animals gave no reaction at the site of inoculation. In some instances the failure to develop a positive vaccinal reaction on the part of nursing young was associated with the immune state of the suckling doe.

Perhaps the most significant result obtained and certainly one which must be taken into account in considering the general question of vaccination, was in connection with latent infections. There were several instances in the very young stock in which the animals were completely negative clinically for periods of upwards of 2 months. There then developed typical generalized manifestations of varying degrees of severity.

There is strong evidence to believe that the failure to develop a primary lesion in certain age groups is due to a natural and transitory refractoriness in the host, and that when this refractory period is passed, the virus which has been harbored by the animal is operative in the production of generalized lesions. Thus certain aspects of these experiments lend support to the concept of a host acting as the carrier of a disease producing agent to which it is non-immune.