tionship, therefore, these lesions are more closely related to the second than to the first inoculation.

Viewed in this light, it would be difficult to attribute the infection produced in this animal to either of the strains of *Treponema pallidum* with which it was inoculated and although the outstanding manifestations of disease conformed more to the general character of the infection produced by the second than by the first organism, it would seem to be more logical to regard the infection as one produced by the combined action of the two organisms. These results are presented as a means of directing attention to the possibilities of double or multiple infection where appropriate conditions exist rather than to the probabilities of their occurrence.

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Report on anaphylactic deaths in guinea pigs from intracutaneous injection of small amounts of egg albumin.

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In view of the importance of the many problems arising in regard to the relationship between intracutaneous skin reactions and true anaphylaxis, the following laboratory "accident" would seem well worth reporting. It seems especially interesting in connection with the account of a human case of anaphylaxis following the intradermal injection of egg protein which was published by Goestenberger and Davis, and which bears out certain views concerning the relationship of bronchial musculature and anaphylaxis brought out by Wells[1] in his recent critical articles in the *Physiological Reviews*. The occurrence which is unique in our experience with anaphylactic guinea pigs, was as follows:

Six guinea pigs, 341, 349, 62, 568, 1122, and 1119, three males and three females ranging in weight from 235 grams to 265 grams, were treated on February 9 with intraperitoneal injections of 2 c.c. of a solution of crystallized egg albumin, representing about

[1] Wells, *Physiological Reviews*, 1921, i, 44.

6.6 per cent. dry weight. The guinea pigs were used in experiments in which parallelism between protein skin reactions in hypersensitive animals and similar skin reactions carried out in tuberculin sensitive animals, was being investigated.

On February 12, 0.1 c.c. of a 1–4 dilution of 6.6 per cent. albumin solution was injected intracutaneously into guinea pig No. 349. No reaction resulted.

On February 15, 0.1 c.c. of a 1–4 dilution of the original 6.6 per cent. egg albumin solution was injected intradermally in all the pigs with three additional controls. The reactions were watched from the time of injection for two hours, at very frequent intervals, and after that, at longer intervals. At the end of twenty hours, No. 1122 showed what was considered a moderate reaction, that is, an area of erythema, about one centimeter in diameter, slightly elevated and slightly edematous. In No. 568 and No. 1119 there was slight erythema, at the site of injection, regarded as probably negative since similar erythema was present in controls.

On February 18, a second skin test was done on all the pigs with 0.1 c.c. of crystallized egg albumin solution representing about 11 per cent. estimated by dry weight, from a distilled water solution. The injections at this time were carefully made by the two writers together, and great care was taken to place the entire amount intracutaneously, well-defined white wheals being formed during the injection. Since no adverse symptoms were expected immediately, all the pigs were put into a wire basket and carried into the next room. Within a few minutes, No. 1122, No. 349 and No. 1119 became sick, and No. 1122 and No. 349 were dead within three minutes. It was unfortunate that the actual condition of these pigs during these three minutes was not more carefully observed, since they were dead by the time the basket was again picked up, which was just three minutes after injection. From the condition of No. 1119, however, the symptoms can be inferred, since this pig showed symptoms after three minutes, with a tendency to fall down and very labored respirations, which continued for about an hour, gradually improving during this time. This pig survived. Immediate autopsies done on the two other pigs which died showed typical inflation of the lungs, the heart

still beating in the first one autopsied. In every way these pigs resembled pigs dead of anaphylaxis. The wheal at the point of inoculation had not materially changed in size, the inference being that the 0.1 c.c. of the 11 per cent. egg albumin had been absorbed in part only.

No comment is made on this occurrence, and it is reported only as a very peculiar accidental observation which is of great importance to us in connection with the general question of sudden anaphylactic death from minute doses of antigen injected intracutaneously. It appears to be an example of acute death in individual sensitized guinea pigs by the absorption from the skin of very minute amounts of a reasonably pure protein. Attempts to repeat this result with a dozen guinea pigs, since that time, have not succeeded.