Apparently very large doses of vaccine are required by either route of administration and the resulting immunity is apparently of short duration.

Summary. 1. Rabbits have been successfully vaccinated by 5 subcutaneous injections of a heat-killed aqueous suspension of Type I pneumococcus vaccine against fatal intradermal pneumococcus infection. 2. When the vaccine was given by stomach tube about 38% of rabbits survived. 3. With Type II vaccine all animals including the controls survived following intradermal pneumococcus infection but the local lesions, septicemia and associated febrile and leukocytic changes were less marked among the immunized animals and especially those receiving 5 subcutaneous injections of vaccine. 4. All rabbits immunized with Type III vaccine by subcutaneous and oral administration survived along with 1 out of 2 controls following intradermal infection. The local lesions and associated fever and leukocytosis were milder among the vaccinated animals than in the controls and especially among those immunized with subcutaneous injections of vaccine.

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Chemotherapy of Intradermal Pneumococcus Infection of Rabbits. Effects of Optochin and Other Quinine Compounds.

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Rabbits were inoculated intradermally with 0.2 cc. of 18-hour broth cultures of a highly virulent Type I pneumococcus after the method of Goodner.[1]

Immediately after 2 rabbits were given 0.005 gm. *optochin base* (Merck) and 2 additional animals 0.01 gm. per kilo by stomach tube and the doses repeated every 6 hours over a period of 3 days. There was no appreciable influence upon the local lesions, temperatures, leukocytic changes, positive blood cultures or cultures of edema fluid. All animals succumbed in from 4 to 5 days.

Two rabbits were given *optochin base* in dose of 0.01 gm. per kilo every 6 hours for 4 doses before intradermal inoculation with pneu-

[5] Kolmer, J. A., and Rule, A. M., PROC. SOC. EXP. BIOL. AND MED., 1933, **31**, 243.

[1] Goodner, K., *J. Exp. Med.*, 1928, **48**, 1, 413; 1931, **54**, 817.

mococcus and then every 6 hours thereafter for 4 additional doses. The compound was without appreciable effect upon the local lesions, associated septicemia, etc., and both succumbed in 4 days.

Two rabbits were given *optochin base* suspended in oil by intramuscular injection in dose of 0.01 gm. per kilo immediately after intradermal inoculation with pneumococcus and repeated every 24 hours for 3 additional doses. Both succumbed about 4 days later with no appreciable effects upon the local lesions, associated septicemias, etc.

Two rabbits were given *ethyhydrocuprein hydrochloride* dissolved in water by intramuscular injection in dose of 0.01 gm. per kilo immediately after intradermal inoculation with pneumococcus and repeated daily for 2 additional doses. Both animals succumbed between 3 and 4 days after inoculation with no appreciable effects upon the local lesions, septicemias, etc.

Two rabbits were given *quinine* and *urea hydrochloride* by stomach tube in dose of 0.01 gm. per kilo immediately after intradermal inoculation with pneumococcus and the dose repeated every 6 hours for 6 additional doses. Two additional animals were given the same compound in the same dosage by intramuscular injection immediately after intradermal inoculation and repeated every 6 hours for 4 additional doses. All 4 animals succumbed in about 4 days with no appreciable effects upon the local lesions and associated septicemias, fever, leukocytosis, etc.

Two untreated controls inoculated intradermally at the same time developed the typical local lesions with daily positive cultures of edema fluids, daily positive blood cultures, leukocytic and febrile changes and succumbed between 4 and 5 days after inoculation.

Summary. Optochin base, ethyhydrocuprein hydrochloride and quinine and urea hydrochloride administered by stomach tube and by intramuscular injection in repeated doses had no appreciable curative effects upon the local lesions, associated septicemia, fever or leukocytic changes induced in rabbits by the intradermal inoculation (Goodner) of virulent type I pneumococcus.