trast, the formolized virus protein is soluble, and it has been proved that the inactivation is not due to toxicity. The inactivation by means of formaldehyde, the subsequent reactivation, and the condition of certain groups in each case can best be interpreted by means of familiar chemical reactions and are direct experimental evidence that virus activity is a specific property of the protein.

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Sulfanilamide and Prontosil in the Treatment of Canine Distemper.*

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Sulfanilamide and prontosil have been found effective in otherwise apparently fatal cases of infection with meningococci[1] and hemolytic streptococci,[2, 3, 4] as well as in gonococci[5] infections, but curative value has not been shown in cases of infection with filtrable viri or with bacilli. It is now well established that canine distemper is caused by a filtrable virus.[6] The naturally occurring disease is, however, invariably complicated by infection with *B. bronchisepticus* and frequently with other secondary invaders. These greatly increase the mortality in distemper, and might be susceptible to the influence of sulfanilamide and its derivatives. We undertook to test this hypothesis in a naturally occurring epizoötic of distemper at the Whitney Kennels, Orange, Connecticut.

All the dogs exhibited typical distemper symptoms, including temperature curves. Moreover, two ferrets, injected with a suspension of the spleens of dogs which died during the epizoötic, developed severe distemper in 9 days; while 7 young dogs of known distemper-

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free history, vaccinated with a formolized suspension of the same spleens, have remained immune to distemper during a subsequent well-controlled exposure in other kennels.

Our experimental treatment was begun 6 days after distemper was first noted in the kennel, and a number of bloodhounds had already succumbed. Twenty-nine animals in various stages of the disease were divided into 4 groups as comparable for the purpose as possible. Four dogs received sulfanilamide, 9 prontosil, 4 both drugs, and 12 dogs served as untreated controls. Prontosil was injected subcutaneously as a 2.5% solution in 0.6% sodium chloride, while sulfanilamide was administered orally in the form of tablets of "Prontylin". In all cases the drugs were given 3 times daily in the dosages indicated below.

Neither prontosil nor sulfanilamide appeared to have any definite beneficial effect. One foxhound, obviously near death when treatment was begun, died 4 hours after prontosil, 50 mg. per kilo. Of the bloodhounds, a breed among which the mortality from distemper is exceptionally high, 2 with moderate fever receiving both drugs (prontosil 25 mg. per kilo and prontylin 50 mg. per kilo) survived for several weeks, but eventually died after treatment had been discontinued. The remaining 2 thus treated (in high fever and collapse respectively) and 3 untreated animals (2 with high and one with moderate fever) all died inside of 4 days. Two young "coonhounds" were given prontosil, 50 mg. per kilo, beginning 2 days after exposure to the disease, but like their 2 untreated littermates, died within 8 days. A treated (prontosil, 50 mg. per kilo) and an untreated Scotch terrier both survived. Of 2 cocker spaniels, while the untreated control died from some unknown cause one week after the return of the temperature to normal, the one receiving prontosil (50 mg. per kilo) survived.

Our most instructive results were obtained on a single litter of 13 young mongrels of high resistance. Beginning one day after exposure, 4 dogs were given prontosil (50 mg. per kilo), 4 were given sulfanilamide (33 mg. per kilo), and 5 received no treatment. A single dog from each group died within 8 days, and among the survivors there was no evidence that the disease was less severe in the treated than in the untreated control animals.

From the above study of 17 treated and 12 untreated dogs, no evidence has been found for the effectiveness of sulfanilamide or prontosil in the treatment of naturally occurring distemper. Our results emphasize the need for uniform stock for the study of dog diseases.