

THE INSTITUTE REPORT



From the
VETERINARY VIRUS RESEARCH INSTITUTE
Cornell University, Ithaca, New York

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MESSAGE FROM THE DIRECTOR

LIBRARY

THIS, our twelfth annual report to the donors, is dedicated to all of the persons whose contributions make possible the continuation of work at the Institute. Such work itself, of course, is our best means of thanking you for your interest. The Institute Report, therefore, is prepared specifically for you in order that you might have a brief glimpse of the nature of the various lines of research which are being investigated in the different laboratories of the Institute.

HETEROTYPIC VACCINES. This new term, for a new concept of immunity, was introduced for the first time in a paper presented in April, 1962 at the annual meeting in Atlantic City, New Jersey of the Federation of American Societies for Experimental Biology. This was followed on May 24, 1962 by a Cornell news release entitled, "Heterotypic Vaccines, A New Concept," which appeared in various magazines and newspapers throughout the world and created great interest.

Vaccines in use at the present time are termed "homotypic" because they are prepared from viruses of the same disease that the vaccines are intended to prevent. In the heterotypic vaccine concept, vaccine is produced from a type-related virus belonging to the same group of viruses but not from the same disease or even from the same species of animal. While not yet made into a vaccine for dogs, measles virus from human beings could be developed into a heterotypic vaccine for distemper because measles virus effectively protects dogs against distemper. Also, human adenoviruses show a heterotypic relationship with infectious canine hepatitis. Because there are only about a dozen different groups of viruses in contrast to the many hundreds of types of viruses, obviously the new heterotypic concept, if successfully proven, could greatly simplify future production of safe and effective vaccines. Already we have combined successfully a number of homotypic vaccines; an example is the combined vaccine for distemper and infectious canine hepatitis. If heterotypic vaccines similarly can be combined, then a single inoculation might give protection against many viral diseases. The potential is most exciting, but much careful work remains to be done.

THE EFFECT OF NUTRITIONAL FACTORS ON IMMUNITY. Results thus far have shown that a deficiency of calcium pantothenate in pigs severely affects their ability to produce antibody against hog cholera. Studies are in progress with dogs and pigs in order to determine whether published requirements for calcium pantothenate and pteroylglutamic acid actually are adequate for antibody synthesis against living viral antigens. In dogs severe atrophy

of lymphoid tissues and impairment of distemper and canine hepatitis antibody synthesis has been found in dogs with a deficiency of folic acid in their diet.

THE INFECTIOUS DISEASE STATUS OF THE DOG. Of the common ailments from which dogs suffer, only three infectious diseases have been found widely prevalent: distemper, infectious canine hepatitis, and leptospirosis. If these three could be prevented, then a well-cared-for dog should have a healthy life, except possibly for parasites and an occasional bacterial or fungal infection. The dog is not subject to all of the upper respiratory infections, internal infections, or other viruses that commonly cause disease in human beings, cattle, pigs, cats, and almost all other animals. Our kennel of disease-free dogs are kept free from disease by management practices. Unfortunately, these practices cannot be applied to the average dog. A good substitute is to vaccinate. Immunized dogs lead healthy lives.

OCULAR EFFECTS OF INFECTIOUS CANINE HEPATITIS VIRUS. Any dog owner who has had a dog infected with infectious canine hepatitis must have been alarmed at the "white eye" that develops during the period of recovery. We have wondered why this should happen after the dog seems to be on the way to recovery. Apparently, live virus persists in the eye and, as the dog develops immunity, this virus reacts with antibodies as they appear in the eye. This reaction between virus and antibodies causes the eye to appear white. Eventually, the eye becomes normal again as virus is overcome by antibodies.

DISTEMPER EVALUATION FINDINGS. The Distemper Evaluation Laboratory continues to accumulate interesting data related to distemper. The resistance of dogs has been analyzed statistically, because we feel that further improvement can be made. For example, it has been found that dogs which have developed a satisfactorily high antibody titer retained immunity for a comparatively long time, whereas dogs that have developed only a low antibody titer lost even this immunity and became susceptible much more rapidly than the dogs which developed high titers in the first place. As yet we do not know why this occurs, although we suspect certain nutritional factors which we are studying. Laboradors and Cocker spaniels seem able to develop higher titers than can Pointers and Beagles. We hope to accumulate much more information about such breed differences which will be sent you in further reports.

LABORATORY DEVELOPMENTS. Our budget for the Cornell Research Laboratory for Diseases of Dogs remains \$110,000 annually. During the coming year an expansion could be made possible by an increase in support. This would enable the addition of a trained parasitologist to the new tissue

culture research staff, with the hopes that modern techniques could be applied to a number of problems of parasitology in dogs.

We are grateful to all of our supporters, who by their interest and generous financial help have made this the best year in our history. We should like to express special appreciation to the following for their assistance, counsel, and support during past years: Colonel and Mrs. Lee Garnett Day, Mrs. Geraldine R. Dodge, Mr. Richard King Mellon, Mr. John M. Olin, Mr. and Mrs. H. B. Stewart, Jr., Mr. Richard Tift, and Mr. John C. Neff and the members of the Research Committee of the American Kennel Club, Mr. T. W. Merritt, Mr. Howard Parker, and Mr. C. K. Rickel.



King Buck, twice National Retriever Dog Champion, deceased in 1962 at the age of 14 years, was one of the original dogs in the distemper evaluation study.

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ELIZABETH WHEELER, Laboratory Assistant.

*Mrs. Baker was appointed to this position in 1951 and has served since that time without salary, as a personal contribution to the Institute.

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**These veterinarians and scientists in various parts of the United States are contributing much time and effort, without compensation, in order to help secure the necessary information on which to base a program to conquer distemper.



PUBLICATIONS FROM THE VETERINARY VIRUS
RESEARCH INSTITUTE

All of our publications from the opening of the Institute to 1960 were listed in the tenth Institute Report. Papers since that time include the following:

- (119) BAKER, J. A.; Robson, D. S.; Carmichael, L. E.; Gillespie, J. H.; and Hildreth, B.: Control Procedures for Infectious Diseases of Dogs. Proc. Animal Care Panel, 1961, 11, 234.
- (120) _____; Implication of Newer Knowledge in the Eradication of Hog Cholera. Proc. U.S. Livestock Sanit. Assoc., 1961, 65, 354.
- (121) _____; Control Procedures for Infectious Diseases of Dogs. Advances in Small Animal Practice, 1962, 3, 19.
- (122) _____; Robson, D. S.; Hildreth, B.; and Pakkala, B.: Breed Response to Distemper Vaccination. Proc. Animal Care Panel, 1962, In Press.
- (123) CARMICHAEL, L. E.; and Barnes, F. D.: Serological Comparisons Between Infectious Canine Hepatitis Virus and Human Adenovirus Types. Proc. Soc. Exp. Biol. & Med., 1961, 107, 214.
- (124) _____; and Barnes, F. D.: The Relationship of Infectious Bovine Rhinotracheitis Virus to Equine Rhinopneumonitis Virus. Proc. U.S. Livestock Sanit. Assoc., 1961, 65, 384.
- (125) _____; and Barnes, F. D.: Serological Activities of Antigenic Components of Infectious Canine Hepatitis Virus. Cornell Vet., 1962, 52, 122.
- (126) _____; and Baker, J. A.: Secondary Serological Response to Infectious Canine Hepatitis Virus Produced by Adenovirus Type 4. Proc. Soc. Exp. Biol. & Med., 1962, 109, 75.
- (127) _____; Robson, D. S.; and Barnes, F. D.: Transfer and Decline of Maternal Infectious Canine Hepatitis Antibody in Puppies. Proc. Soc. Exp. Biol. & Med., 1962, 109, 677.
- (128) _____; and Barnes, F. D.: Human Adenovirus Complement-Fixing Antibodies in New York Family Dogs. Proc. Soc. Exp. Biol. & Med., 1962, accepted for publication.
- (129) COGGINS, L.; and Sheffy, B. E.: A Serological (Virus Neutralization) Test for Hog Cholera. Proc. U.S. Livestock Sanit. Assoc., 1961, 65, 333.
- (130) _____; Gillespie, J. H.; Robson, D. S.; Thompson, J. D.; Phillips, W. V.; Wagner, W. C.; and Baker, J. A.: Attenuation of Virus Diarrhea Virus (Strain Oregon C24V) for Vaccine Purposes. Cornell Vet. 1961, 51, 539.
- (131) _____; Hog Cholera and Virus Diarrhea Antibodies in Swine. Cornell University, Thesis, 1962.
- (132) GILLESPIE, J. H.; Sheffy, B. E.; Coggins, L.; Robson, D. S.; and Baker, J. A.: Propagation and Attenuation of Hog Cholera Virus in Tissue Culture. Proc. U. S. Livestock Sanit. Assoc., 1961, 65, 57.
- (133) _____; Madin, S. H.; Darby, N. B., Jr.: Cellular Resistance in Tissue Culture, Induced by Noncytopathogenic Strains, To A Cytopathogenic Strain of Virus Diarrhea Virus of Cattle. Proc. Soc. Exp. Biol. & Med., 1962, 110, 248.
- (134) _____; and Baker, J. A.: The Virus of Canine Distemper, N. Y. Acad. of Sci., 1962, In Press.

- (135) _____; Madin, S. H.; and Darby, N. B., Jr.: Studies With Virus Diarrhea Virus of Cattle, With Special Reference To Its Growth In Tissue Culture And Its Ether Susceptibility. Cornell Vet., 1962, submitted for publication.
- (136) LANGER, P. H. and McEntee, K.: Characterization of Virus Isolates from Cattle. Proc. U. S. Livestock Sanit. Assoc., 1961, 65, 389.
- (137) ROBSON, D. S.; Coggins, L.; Sheffy, B. E.: The Neutralization Test as an Indicator of Immunity. Proc. U. S. Livestock Sanit. Assoc., 1961, 65, 338.
- (138) _____; Hildreth, B.; Carmichael, L. E.; Atkinson, G. F.; Barnes, F. D.; Pakkala, B.; and Baker, J. A.: Standardization of Quantitative Serological Tests. Proc. U. S. Livestock Sanit. Assoc., 1961, 65, 74.
- (139) SHEFFY, B. E.; Baker, J. A.; and Gillespie, J. H.: A Disease-Free Colony of Dogs. Proc. Animal Care Panel, 1961, 11, 208.
- (140) _____; Coggins, L.; and Baker, J. A.: Protection of Pigs Against Hog Cholera with Virus Diarrhea Virus of Cattle. Proc. U. S. Livestock Sanit. Assoc., 1961, 65, 347.
- (141) _____; Relationship Between Hog Cholera Virus and Virus Diarrhea Virus of Cattle. Proc. Soc. Exp. Biol. & Med., 1962, 109, 349.

Eye tissues are being examined for presence of infectious canine hepatitis virus.



ACKNOWLEDGEMENTS

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A technician caring for laboratory dogs.

