

THE INSTITUTE REPORT



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

September, 1963

Volume 13

N. Y. S.
VETERINARY COLLEGE

THE INSTITUTE REPORT

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MESSAGE FROM THE DIRECTOR

THIS annual report of progress from the staff of the Veterinary Virus Research Institute to founders and donors of the Cornell Research Laboratory for Diseases of Dogs marks our thirteenth year of operation. Rather than an unlucky thirteen, this has been a productive year because the passage of time has allowed certain observations and comparisons to be made.

Work in Cornell Research Laboratory for Diseases of Dogs

Cancer Viruses to Be Studied

For instance, because of the suspected viral origins of some cancers, there is much interest in the fact that, during these thirteen years, there has not been a single cancer in any of the different generations of our disease-free, and, therefore, virus-free, dogs.

Nutrition

The effects of nutrition upon the production of antibodies continue to receive careful study, with new understanding of the role of nutrition in ability of the body, at cellular level, to withstand disease. In dogs, a deficiency of folic acid may cause severe atrophy of lymphoid tissues and the impairment of distemper and canine hepatitis antibody synthesis. Notations also are being made upon pyridoxine and methacoline. Correlations are being studied between requirements for growth and those necessary for efficient production of antibodies. Dietary needs for these nutrients are being established and recommendations will be made.

Alert for New Diseases

In addition to continued work for better control of recognized diseases, careful watch is maintained by the CRLDD for possible appearance of new pathogenic agents in dogs, similar to the human influenzal types that were found during 1963 in horses. This is one of the reasons for having a permanent center for research constantly in operation rather than to have only temporary projects scattered in many places.

Correlated Studies

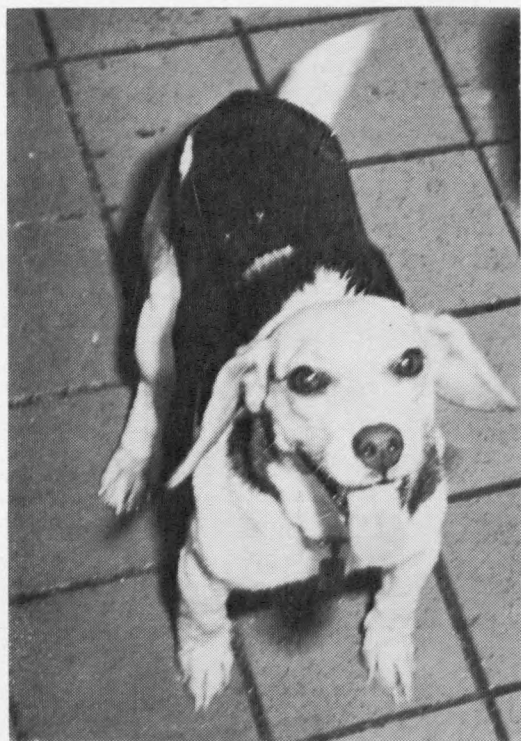
Another major reason for having a permanent research center designed and built specifically for work with infectious diseases of various

species of animals is that it enables correlations to be made by veterinary scientists, who are familiar not only with the behavior and characteristics of many different types of organisms, but, equally important, with the anatomy, pathology, and physiology of the various species of animals which may be infected. Workers in the Cornell Research Laboratory for Diseases of Dogs have the advantage of being allowed immediately to adopt new developments which may occur through research with other animals in the Microbiology Laboratories of the Institute, and the converse holds equally true.

The importance of colostrum and the proper age for effective vaccination of young pigs was seen in early studies with hog cholera virus. After the CRLDD was founded and work began in its laboratories, definitive studies of colostrum were made with distemper virus in dogs.

Heterotypic Vaccines

Now, once again, studies from the Microbiology Laboratories of the Institute with hog cholera have been adapted in the CRLDD to benefit the health of dogs.



A new concept in immunology, which originated at the Institute, is being applied to several species of animals, and is being evaluated at the present time in extensive field studies, with our cooperation, and with valuable cooperation from veterinarians and from a number of state, federal, and foreign government officials in Georgia, Hawaii, Argentina, Australia, Lebanon, and in Missouri, following a nearly perfect score in preliminary field tests in Jackson County, Florida in 1962.

This new concept concerns heterotypic vaccines, which briefly were mentioned in the *Institute Report* last year as having potential importance. Our new vaccines are called *heterotypic* (from *hetero* meaning different) because the virus used for protection is different from the virus of the disease for which the vaccine is used. This is in contrast to ordinary *homotypic vaccines* (from *homo* meaning same).

Hundreds of swine have been protected successfully against fully virulent, pure, hog cholera virus by our experimental heterotypic vaccine, called BVD vaccine, made from the virus of bovine virus diarrhea, a disease of cattle.

In the CRLDD, a similar heterotypic vaccine was made for dogs, using measles virus from human beings. The experimental vaccines, made and tested here, have worked perfectly in the laboratory. Now, with cooperation of veterinarians in various parts of the country, extensive field tests are being made. The vaccine for dogs is similar to some of the several different types of measles vaccines that are being manufactured and sold for use in children. None of the vaccines made for children should be used in attempts to vaccinate puppies, because measles vaccine for children is an example of a homotypic vaccine, while a measles vaccine for distemper in dogs is a heterotypic vaccine, and, therefore, a different passage level of the measles virus is necessary for reliable protection of puppies. The vaccine for dogs must be made specifically for the requirements of dogs.

Because the new heterotypic vaccine for dogs can be given safely to newborn puppies without any negative effects from maternal antibodies received either from colostrum or *in utero*, it should prove valuable in protecting young puppies until they are over three months of age, at which time they can be immunized more permanently with one of the dual vaccines for protection against distemper and infectious canine hepatitis. Later, of course, they should be revaccinated annually for continuous protection against distemper, infectious hepatitis, and also leptospirosis.

The measles vaccine for dogs is intended to precede and supplement, but not to replace, the usual live virus dual vaccine which protects dogs

against distemper and infectious canine hepatitis. The dual vaccine, originally developed at the CRLDD, and sometimes referred to as Cornell-type vaccine, now is manufactured or distributed by pharmaceutical companies in nearly all parts of the world where dogs receive careful attention.

A similar heterotypic vaccine for protection of newborn puppies against infectious canine hepatitis is being studied also. Many different strains of adenoviruses from human beings are being screened for that purpose in the CRLDD.

Mycoplasma and Other Studies

Studies are continuing at the Institute on the role of *Mycoplasma* in various diseases. Fluorescent antibody methods and serology are used to study the pathogenesis, persistence of infection, and immune response to *Mycoplasma*. These organisms have been found in mastitis and udder infections of cattle, and have been recovered from the lungs and kidneys of moribund puppies, sometimes in connection with *Proteus mirabilis* and *E. freundii*. They have not yet been found in simultaneous infection with distemper or canine hepatitis, or mastitis of dogs, although this remains a possibility.

Ocular lesions caused by infectious canine hepatitis are of interest. The iridal reaction seems to be initiated by local antibody arising from plasma cells in the iris and trabeculae, which react with virus in the endothelium of iridal capillaries and trabecular endothelial cells.

The replication cycle of infectious canine hepatitis is being studied, using fluorescent antibody, acridine orange, and tritiated thymidine techniques.

Work in Microbiology Laboratories

Some of the work on infectious diseases of cattle now is being supported by contributions specifically for this purpose from interested individuals.

Vaccine Studies

In studies similar to those which resulted in the dual vaccine for dogs, combined vaccines for diseases of cattle have been made and are receiving much attention in the Microbiology Laboratories and an extensive field trial in New York State on dairy farms, through the cooperation of a number of veterinarians and owners of cattle.

Infectious Diseases of Cattle

The epizootiology of bovine diarrhea and etiology of winter dysentery are being investigated. Studies continue on infectious bovine rhino-

tracheitis, and fluorescent antibody techniques are being used on hog cholera and virus diarrhea viruses. Physical and chemical properties of these viruses are being studied.

Serological techniques are used upon hundreds of carefully selected blood samples to reveal problems most prevalent in animals.

Abortions and breeding troubles in herds that use artificial insemination are being investigated.

Analytical studies of heterologous immunity are being made with a variety of viruses, and the nature of heterotypic response is being analyzed.

Horses

Virus abortion in mares is being studied.

IN APPRECIATION

We are grateful to all of our supporters whose interest and financial help make possible continued work in the Cornell Research Laboratory for Diseases of Dogs. Especially, we wish to thank the following for assistance, counsel, and generous support during past years: Colonel and Mrs. Lee Garnett Day, Mrs. Geraldine R. Dodge, Mr. Richard King Mellon, and Mr. John M. Olin.

Mr. Richard Tift has volunteered much time and effort to the collection of funds for the Laboratory.

Mr. John C. Neff, Executive Secretary of the American Kennel Club, and members of the Research Committee of the American Kennel Club, Mr. T. W. Merritt, Mr. Howard Parker, and Mr. C. K. Rickel have continued generous support for the CRLDD's Distemper Evaluation Laboratory

Mr. Harry Miller, known to thousands of dog owners as the Director of the Gaines Dog Research Center, as an expression of his personal interest in the Laboratory has designated the CRLDD as recipient of all royalties from his book, "The Common Sense Book of Puppy and Dog Care."

Mr. George Berner and the staff of *Dog World Magazine* are waging a voluntary and valuable campaign to help raise funds for the CRLDD from dog owners all over the United States.

Appreciation is expressed to Dr. D. B. H. Dalrymple and Dr. R. Fuller for their great help in field studies of the BVD vaccine in New York State.

STAFF ACTIVITIES

The staff continues to try to assist in informing those who are interested in the health of animals. Publications listed in the following pages

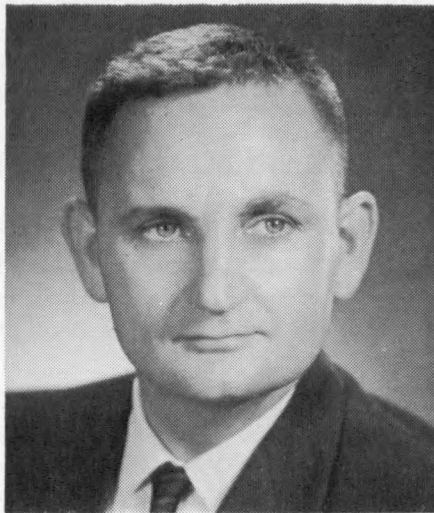
include several articles written for the general public as well as technical scientific papers from the Institute.

In addition to working in the laboratories, staff activities during the past year have included talks at several different kennel club meetings, dairy cattle associations, Rotary Clubs, veterinary society meetings, the US Livestock Sanitary Association national meeting, and groups of veterinarians and students in Connecticut, Georgia, Hawaii, Indiana, Illinois, Michigan, Chile (Santiago), and in Montevideo (Uruguay).

Dr. Hadley C. Stephenson was honored by being given the A. M. Mills Award for outstanding contributions to Veterinary Medicine by the Alpha Psi Fraternity of the School of Veterinary Medicine, University of Georgia.

THE JOHN M. OLIN PROFESSORSHIP

We are happy to announce approval by the Cornell University Board of Trustees of a new endowed professorship for the Veterinary Virus Research Institute. This new position has been named the John M. Olin Professorship, in appreciation for all that Mr. Olin has done for the Institute.



Dr. Leland E. Carmichael, director of the Cornell Research Laboratory for Diseases of Dogs, has been appointed to the John M. Olin Professorship, beginning July 1, 1963. Dr. Carmichael holds the A.B. and D.V.M. degrees from the University of California and received the Ph.D. degree from Cornell in 1959, with a major in virology.

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 the last annual report include the following:

- (142) BAKER, DUDLEY: Distemper Will Be Conquered. Pure-Bred Dogs—American Kennel Gazette, May, 1963.
- (143) _____: The Latest Distemper Preventative Outlined. Popular Dogs, July, 1963.
- (144) _____: Simplified Methods for Hand Rearing Puppies. Dog World Magazine, August, 1963.
- (145) BAKER, JAMES A.: Atkinson, G.F.; Campbell, Clarence; Coggins, L.; Nelson, D.; Robson, D.; Sheffy, B.E.; and Sippel, W.: Bovine Virus Diarrhea (BVD) Vaccine for Protection of Pigs Against Hog Cholera. Proc. U. S. Livestock Sanit. Assoc., 1962, 66, 326.
- (146) _____: Robson, D. S.; Hildreth, B.; and Pakkala, B.: Breed Response to Distemper Vaccination. Proc. Animal Care Panel, 1962, 12, 157.
- (147) _____: Heterotypic Vaccines: A New Concept for Prevention of Virus Diseases in Dogs. Gaines Symposium, Michigan State University, 1963.
- (148) Thomas, E. D.; BAKER, J. A.; and Ferrebee, J.W.: The Effect of Methotrexate on the Production of Antibodies Against Attenuated Distemper Virus in the Dog. J. Immunol., 1963, 90, 324. (*Work for this publication was carried out at the Mary Imogene Bassett Hospital of Coopers-town, a branch of Columbia-University's Medical School. Dr. Baker is a staff consultant in Virology and Veterinary Medicine.*)
- (149) CARMICHAEL, L. E.: Factors that Influence the Neutralization Test. Proc. U. S. Livestock Sanit. Assoc., 1962, 66, 59.
- (150) _____: and Barnes, F. D.: Human Adenovirus Complement-Fixing Antibodies in New York Family Dogs. Proc. Soc. Exp. Biol. & Med., 1962, 110, 756.
- (151) _____: The Pathogenesis of Ocular Lesions of Infectious Canine Hepatitis. I. Observations on Spontaneous Eye Lesions. In Preparation.
- (152) _____: Infectious Canine Hepatitis. Chapter in "Current Therapy—Small Animal Practice," R. W. Kirk, Ed., Saunders & Co. Philadelphia, Pa. In Press.
- (153) COGGINS, L.: Sheffy, B. E.; and Baker, J. A.: Response of Swine to Hog Cholera Vaccines. Proc. U. S. Livestock Sanit. Assoc., 1962, 66, 316.
- (154) _____: Standardization of Bovine Virus Diarrhea Virus Neutralization Test. Proc. Soc. Exp. Biol. & Med., 1963. In Press.
- (155) _____: Standardization of Hog Cholera Neutralization Test. 1963. In Preparation.
- (156) GILLESPIE, J. H.; Madin, S. H.; and Darby, N. B., Jr.: Studies in Virus Diarrhea Virus of Cattle, with Special Reference to its Growth in Tissue Culture and its Ether Susceptibility. Cornell Vet., 1962, 53, 276.
- (157) _____: The Virus of Canine Distemper. N. Y. Acad. of Sci., 1962, 101, 540.
- (158) KAHRs, R.: Field Evaluation of Combined Vaccines for Dairy Cattle. Thesis, Cornell University, 1963.

VIRUS RESEARCH INSTITUTE STAFF

General Institute Staff

- JAMES A. BAKER, B.S., M.E. (Louisiana State University), D.V.M., Ph.D. (Cornell), Director of the Institute and Professor of Virology.
- JAMES H. GILLESPIE, V.M.D. (University of Pennsylvania), Assistant Director of the Institute and Professor of Bacteriology. Dr. Gillespie is on leave of absence to serve as Executive Secretary on the Committee on Foot-and-Mouth Disease, National Academy of Sciences, National Research Council.
- BEN E. SHEFFY, B.S., M.S., Ph.D. (Wisconsin), Caspary Professor of Nutrition and Acting Assistant Director of the Institute.

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- VIVIAN MORGAN, Laboratory Technician.
- SHIRLEY SEO, B.S. (Syracuse), Laboratory Technician.
- MARIE WAMPACH, Laboratory Technician.
- 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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Distemper Evaluation Laboratory (Operating Funds Provided by the American Kennel Club):

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**These veterinarians are contributing much time and effort, without compensation, in order to help secure the necessary information on which to base a program for cattle.

***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.

ACKNOWLEDGEMENTS

Contributions received from September 5, 1962 to September 1, 1963
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Cayuga County Veterinary Society	South Florida Veterinary Medical Association
Central New York Veterinary Medical Association	Southern Tier Veterinary Medical Association
District of Columbia Academy of Veterinary Medicine	Veterinary Medical Association of New York City, Inc.
Finger Lakes Veterinary Medical Association	Westchester-Rockland Veterinary Medical Association
Hudson Valley Veterinary Medical Society, Inc.	Western New York Veterinary Medical Association, Inc.
Long Island Veterinary Medical Association	Women's Auxiliary to the New York State Veterinary Medical Society
Metropolitan New Jersey Veterinary Medical Association	

Companies

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 Allentown Dog Training Club, Inc.
 American Amateur Retriever Club
 American Kennel Club
 Arkansas Kennel Club, Inc.
 Armforth Kennels
 Assoc. of Obedience Clubs & Judges, Inc.
 Atlanta Kennel Club, Inc.
 The Back Mountain Kennel Club
 Badger Kennel Club
 Baltimore County Kennel Club, Inc.
 Basenji Club of America
 Beaumont Kennel Club, Inc.
 Bedlington Terrier Club of America, Inc.
 Belgian Sheepdog Club of America, Inc.
 Berks County Kennel Club *
 Blackhawk Retriever Club
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 Bulldog Club of Greater Cleveland, Inc.
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 Burlington County Kennel Club, Inc.
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 ington, D. C.
 Carbon Beagle Club, Inc.
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 Central States, Inc.
 Chicago Bull Dog Club, Inc.

The Chicago Miniature Schnauzer Club,
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 Dallas
 Collie Club of America, Inc.
 Collie Club of Colorado
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 Colonial Beagle Club
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 Colorado Kennel Club
 Colorado Springs Kennel Club
 Columbia State Poodle Club
 Companion Dog Training Club
 Corn Belt Kennel Club
 Cornhusker Kennel Club, Inc.
 Coulee Kennel Club, Inc.
 Dachshund Club of America
 Dachshund Club of California, Inc.
 The Dallas Boxer Club
 Dalmatian Club of America
 Dalmatian Club of California, Inc.
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 Capital Area
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 The Dog Obedience Club of Torrance
 The Dog Owners' Association of
 America, Inc.
 The Dog Owners' Protective Association
 Dog Owners' Training Club of Maryland
 Dog Training Club of Hollywood and

HUNTS AND CLUBS (Cont.)

- Fort Lauderdale
 Dog Training Club of Tampa, Inc.
 Dog World Distemper Fund
 Duluth Kennel Club
 Duluth Retriever Club
 Dunes Dog Training Club
 Dutch Valley Dog Training Class
 Eastern English Springer Spaniel Club,
 Inc.
 Eastern Missouri Beagle Club, Inc.
 Dan Emmett Kennel Club, Inc.
 Electric City Kennel Club
 El Paso Kennel Club
 English Springer Spaniel Club of
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 German Shepherd Dog Club of
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 National Beagle Club of America
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Farm Cooperatives

Cooperative GLF Exchange, Inc.	
Dairymen's League Cooperative Association, Inc.	
Eastern Milk Producers Cooperative Association, Inc.	and the following locals:
Copenhagen	New Berlin
Evans Mills	New Haven (Vt)
Fort Plain	North Chatham
Frasers	Roxbury
Grand Gorge	Walton
Little Falls	
Eastern States Farmers Exchange, Inc.	
Genesee Valley Cooperatives, Inc.	
Lisle Producers Cooperative, Inc.	

Agricultural Businesses

Allied Mills, Inc.	Hegeman Farms Corporation
Arkport Dairies, Inc.	Moorman Manufacturing Company
Beatrice Foods Company	Nadler Brothers, Inc.
Breyer Ice Cream Division	Pine Grove Dairy, Inc.
Cooperdale Dairy, Inc.	Prattsburg Creamery Company
Davenport Center Dairy, Inc.	Queens Farms Dairy, Inc.
Fitchett Brothers, Inc.	M. H. Renken Dairy Company
Foremost Research Foundation	Sealtest Foods Division, Schenectady
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Grandview Dairy, Inc.	

Metropolitan Cooperative Milk Producers Bargaining Agency, Inc. and member cooperatives as follows:

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Adams Center	Lisbon
And-Well	Malone
Bovina Center	Marshall
Burke	Martville
Campbell	Middlebury (Pa)
Canisteo	Montgomery
Cannonsville	Mount Joy (Pa)
Canoe Camp (Pa)	Ogdensburg
Cape Vincent	Oswegatchie
Central New York	Otselic Valley
Champlain	Owasco
Chateaugay	Pierpont Manor
Chautauqua	Port Allegany (Pa)
Circleville	Potsdam
Edwards	Roseville (Pa)
Fair Haven (Vt)	Sherburne
Fingerlakes	Slate Hill
Fort Edward	South Dayton
Galeton (Pa)	South Montrose (Pa)
Georgetown-Sheds	Steamburg
Gouverneur	Sugar Grove (Pa)
Gracie	Tioga Valley
Harford	Towanda Valley (Pa)
Keuka	Watertown
Konhokton	West Burlington (Pa)

Mutual Federation of Independent Cooperatives, Inc. and member cooperatives.
Niagara Frontier Cooperative Milk Producers Bargaining Agency, Inc.

Arcade Farms Cooperative, Inc.
Aurora Independent Milk Producers Cooperative, Inc.
Collins Producers Cooperative, Inc.
Erie County Milk Producers Cooperative, Inc.
Frontier Federated Cooperatives, Inc.
Hollisville Milk Producers Cooperative, Inc.
Niagara County Milk Producers Cooperative, Inc.
United Guernsey Milk Producers Cooperative, Inc.

Western New York Milk Producers Cooperative, Inc.

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The Citizens National Bank of Wellsville	The Bank of LeRoy
The National Bank of Delaware County	Lewis County Trust Company
The State Bank of Albany, Ft. Plain Branch	The National Bank of Florida

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Walter M. Baron	Ring and Stern, Inc.
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Hess Livestock, Inc.	Welch Livestock Market, Inc.
Luther's Livestock Market	

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