The Theory and Practice of Rabies Control

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Rabies is probably one of the oldest known animal diseases communicable to man. Many concepts of the disease as described by Democritus and Aristotle in ancient times are the same as we know them today. As early as 100 A.D., Celsus cauterized the wounds of persons bitten by rabid animals. It was the work of Pasteur, however, that gave us our first insight into the nature of the causative agent, some understanding of the immunity mechanism, and the development of a new prophylactic tool, rabies vaccine.

Since its introduction on the North American continent from Europe in the middle of the eighteenth century, rabies insidiously has continued to exact its toll from the public health, agricultural economy, and wildlife conservation of the United States. In spite of its apparent entrenchment in large segments of civilized populations, it is NOT a disease "we have learned to live with." The inevitable termination of the disease in agonizing death has made it one of the most feared maladies affecting man. Furthermore, the unpleasant and expensive series of vaccinations indicated after exposure is established and the realization that these vaccinations are not always given without danger, have been the source of a conglomerate headache for the health officers of the country.

Examination of the epidemiology of rabies reveals that it is ubiquitous in geographical distribution. Climate and season have no influence on its occurrence. It is found in the arctic regions of Alaska and Canada as well as the tropical countries of the Old and New Worlds. By the same token, it may be present during any season of the year. The disease, in nature, is characterized by a relatively long and variable incubation period. The probability of human infection is dependent upon the concentration of the virus in the saliva of the biting animal, the site of the bite on the body, the depth of the bite, the multiplicity of the bite, and the possible interposition of clothing.

In another phase of the problem, our attention has been drawn in recent years to an increasing number of postvaccinal complications following administration of the prescribed series of rabies vaccine treatments in exposed persons. Laboratory research at present is attacking this serious problem by directing its efforts along two lines. First is an attempt at the development of a hyperimmune rabies serum. The second is the possible refinement of brain and nerve tissue vaccines by removing the so-called encephalitogenic factors by biochemical methods. The status of both of these activities still is experimental, although they have shown great promise in the laboratory. In the meantime, practicing physicians and health officials are being asked to exercise sound judgment in the management of suspected exposure to minimize the promiscuous administration of human rabies vaccine.

We are convinced that the ultimate solution to the rabies problem is predicated on the control and eventual elimination of the disease from animal populations. This may be accomplished by the setting up of transmission barriers such as animal immunization, restriction of animal movement, and the reduction of excessive numbers of susceptible wildlife. Extensive laboratory research and field projects have proved that these techniques may be applied successfully to eradicate the disease from a given area if integrated into a carefully planned and well executed program. Dramatic demonstrations of the effectiveness of such programs have been displayed in recent years in many parts of the United States. It is our desire to muster the forces of the remainder of the country to set similar machinery in motion for an all-out fight against rabies.

It is now an established premise that coordination of control activities is the keynote of a successful state-wide rabies control program. Experience has shown that this can be achieved if the administration of such a program is delegated to a qualified public health veterinarian at State level. The duties and responsibilities of the health department veterinarian in administering a state-wide program would include coordinating the efforts of local control by encouraging accurate reporting; studying the movement and comparative regional prevalence of the disease within the State and

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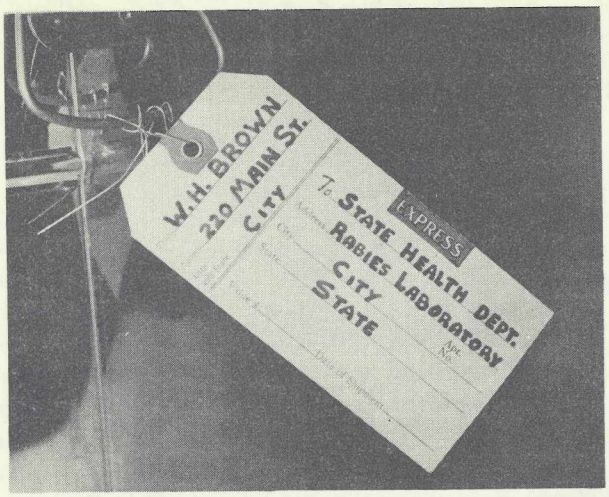

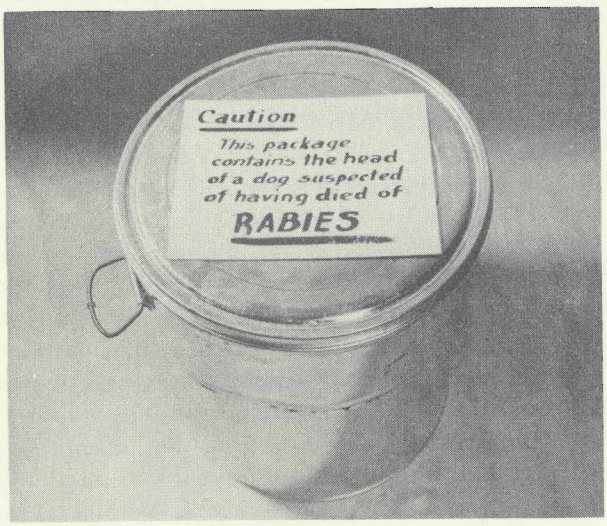

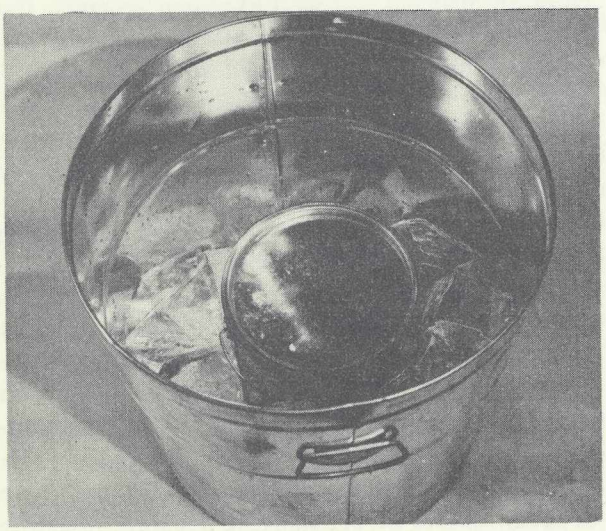

Heads shipped to laboratories for diagnosis should be placed in a small slip-top container, which in turn should be placed in another container large enough to permit ice to be packed between the inner and outer one.

alerting counties on the presence of rabies in neighboring areas; appointing rabies inspectors; improving methods for the shipment of specimens to diagnostic laboratories; surveying facilities for collection and impoundment of stray dogs; making canine vaccines available where needed; exchanging information with neighboring States having similar problems; preparing and distributing educational material throughout the State; and, by frequent visits, advising and consulting with local authorities on current policies and methodology of control practices.

Through professional societies, the State public health veterinarian is in excellent position to stimulate the interest of the private practicing veterinarians of the State and enlist the active participation of practitioners in local control programs. He can serve as an effective liaison officer between the State health department and other interested State agencies such as agriculture and game conservation.

The operational phases of a rabies control program are carried out at the local level. Field demonstrations have shown that local programs work best on a county-wide basis. Successful results cannot be expected if the program is limited to a city or town without including the surrounding suburban and rural areas of the county. The rabid dog often can run the length or breadth of the average American county, spreading the infection to each animal he bites in his path.

Local rabies control programs should be operated on the basis of three broad measures. The first is ANNUAL ANTIRABIES VACCINATION OF ALL DOGS. The importance of canine vaccination as the primary tool in an efficient control program is now a firmly established fact and needs only a well organized educational campaign to bring this fact to the public. The second is the IMPOUNDMENT AND DESTRUCTION OF ALL STRAY AND OWNERLESS DOGS. Needless to say, vaccination will not reach the stray dogs of a community, and it is the stray animal that very often is incriminated in the spread of the disease. This measure requires the operation of a local pound or humane shelter where strays may be kept for a specified period of time, and, if unclaimed at the end of that period, humanely destroyed. Strays should be collected by teams of dog wardens and assistants using trucks with proper enclosures. The third is REGISTRATION OF ALL DOGS. Registration of all dogs in a community is an important adjunct of a successful

Photo by Memphis-Shelby County Health Department

Intensified mass canine immunization techniques are paramount for achieving swift reduction of susceptibles.

control program. If properly enforced, it serves to defray the expenses of the over-all program, establishes responsibility of dog ownership, assures a reasonably accurate dog census, and identifies the unwanted or homeless strays.

The combining of vaccination and registration has proved in some areas to be a sound idea. It tends to make the control program less cumbersome. The dog owner usually appreciates the fact that he has only one trip to make when he can have his dog vaccinated and registered at the same time. The issuing of a single uniform tag for the dog's collar and a single uniform certificate, made out in triplicate, is tantamount to registration. In this scheme, a single fee can be charged which will be low enough to cover all classes of dog owners and high enough to defray the expenses of vaccination and control operations.

In contrast to those communities which have carried out effective mass canine immunization campaigns, we have had the opportunity to observe a few programs which were, at best, abortive in their execution. Careful analysis of the utilization of vaccination in the field has convinced us that it is useless to expect results unless the program has the necessary intensified character. In the face of an outbreak, SWIFT REDUCTION OF SUSCEPTIBLES MUST BE ACHIEVED by vaccinating at least 70 percent of the dogs in the shortest possible period of time. To this end, effective administration is paramount. Community interest must be organized through every available medium. Dog inoculation clinics should be held over a 1- to 2-week period throughout the county at strategic points based on population concentrations and geographic distribution of cases.

In areas of rabies outbreaks in wild animals, such as foxes, adequate trapping programs should be instituted in cooperation with the State game conservation authorities. Rabies in foxes tends to assume epizootic proportions in regions overpopulated with this species. If it becomes established in the susceptible wildlife of an area, it will run its ravaging course in a year or more; and in that time, the resulting mortality may decimate the fox population more completely than any trapping operation. The objective in trapping procedures is to reduce the number of susceptible foxes to a level which will not support an epizootic, and thereby prevent the occurrence of this disaster in the foxes themselves and the danger of its spread to man and domestic animals.