

their removal from the infected ground will frequently check an outbreak before immunity can be produced with the vaccines of either disease. Low-lying, swampy ground, particularly that lying near sluggish streams of water which receive the drainage from woolen factories, tanneries, or from areas where diseased carcasses have been improperly disposed of, are quite liable to be infected. In the event of animals dying of anthrax or black-leg on such ground, all remaining alive should be removed until they are properly vaccinated. Areas where carcasses have been improperly buried may be considered as "infected areas," and should be fenced.

Preventive inoculation against both diseases is widely practised, particularly in localities where it is known that the infectious agent exists. The vaccine (an attenuated or weakened germ product) for the preventive inoculation is prepared in laboratories especially equipped for the work, and there are many institutions of the kind on this continent, one of which is connected with the Biological Laboratory of this department.

These vaccines, when prepared with care, and properly tested, may be considered reliable. With anthrax vaccine, two inoculations are required, the first protecting against infection by the second and the second protecting against an infection with the virulent germ. The interval between the two inoculations varies with the manufacturer, whose instructions should be followed very carefully, but it is usually from ten to twelve days. Black-leg vaccine is sold in two forms, the single and the double vaccine. On this continent the single vaccine is used almost exclusively, and from its name indicates that but a single application is required. The method of applying black-leg vaccine is usually characteristic of the maker, each firm or manufacturer desiring to obtain a method which will be simple and effective, so that it may with safety be placed in the hands of farmers and cattlemen as well as veterinarians. The results following vaccination against either disease are quite satisfactory, yet it must be borne in mind that vaccine used on an animal already affected with either of the diseases in question will not protect such an animal and may not prevent its death, while, on the other hand, the same vaccine will protect an unaffected animal against a subsequent infection for a limited period.

Vaccination should be performed in the spring before the animals are turned out, but in either case is not considered effective for a period greater than twelve months.

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#### CIRCULAR *RE* ANTHRAX VACCINE.

Anthrax vaccines, properly used, afford protection or immunity to a subsequent artificial or natural anthrax infection. The vaccines for protecting against anthrax prepared at this laboratory are dried on braided silk threads, and these braided silk threads are held by a special spring clip to the stopper of their sterile container. Anthrax vaccines are attenuated or weakened cultures of the germ causing anthrax (*bacillus anthracis*). The process of attenuating or reducing the strength of the germ is confined to the laboratory, and cannot with safety be conducted elsewhere.

To protect or immunize an animal against anthrax, two vaccines are required, and protection or immunity is the result of the animal passing through two mild, properly graded attacks of the disease, which, as a rule, cause no inconvenience to the patient save a slight elevation in temperature. During these two mild attacks of the disease it is advisable to take particular care of the animals, protecting them from inclement weather, extremes of heat or cold, etc.

THE FIRST ANTHRAX VACCINE (yellow label), is a very weak virus and is only intended to protect against a subsequent administration after the proper interval (twelve days) of the SECOND ANTHRAX VACCINE (green label), which is a very much stronger virus, and this in turn protects against virulent anthrax. Protection or immunity against anthrax is established in from twelve to twenty days after the administra-