In Taranaki, so long ago as 1889, isolated cases were found in a small area where this fertiliser [imported bone manure] had been used, and for several years no cases outside this area were noted. Then the disease began to spread rapidly, and it became necessary to take proper measures to get it under control. These measures have proved remarkably satisfactory and effective.

Danger from Imported Manures

The vaccination programme certainly prevented wholesale deaths, but the damage was done and the disease was too deeply rooted to be eradicated easily. Unsterilised bone manure had been a prohibited import since 1905 and sterilisation had been subject to rigid inspection. Finally in 1932 importations of animal manures from India were prohibited; it would have saved endless trouble and expense had these manures never been admitted, for with them also came anthrax, though fortunately this occurs to a very limited extent.

Blackleg control at the time of Reakes's article in 1916 was complicated. Areas in Taranaki and Auckland Province were designated "Infected Areas, A or B". There were restrictions on the movement and sale of young cattle in these areas and permits were required. Cattle could be compulsorily vaccinated, and in A areas no young cattle could be moved or sold unless vaccinated. It is strange to read of these precautions and to realise that at the same time thousands of wounded servicemen were dying from gas gangrene (which was one of the worst "killers" of the First World War) when inoculation would have prevented losses for which medical science, lacking the blessing of penicillin, had no answer.

Reakes says of calves with blackleg: "Medicinal treatment, from a curative point of view, is of little or no value, and the one effective measure is prevention".

Use of Vaccine

By 1918 Wallaceville Laboratory, as the Animal Research Station was then known, had increased the output of blackleg vaccine to 226,000 doses, almost double the number issued in the previous year, to cope with the extension of blackleg control to Auckland Province. In 1919 the infected areas were increased in size so that much of Auckland Province and all of Taranaki were involved.

Inoculation against blackleg began to decrease in the 1920s, some 103,000 doses being used in 1921 and 86,000 the following year. In 1924 the annual report of the Livestock Division stated:

> The need for vaccination of calves is still apparent, but it is satisfactory to report that the disease does not show any increase, nor has it extended to other districts. The continuance of the restriction on the movement of calves out of the quarantine areas is necessary in order to safeguard clean districts.

In 1926 it was suggested by the Department that regulations could be relaxed:

> The number of actual deaths reported as due to blackleg is very small compared with the volume of work entailed in general vaccination. No case of blackleg has occurred in Hawera district for over three years.

Malignant oedema, a disease caused by bacteria which are close relatives

M. B. Buddle, author of a "Journal" article in 1941 which was to alter completely the previous conception of blackleg in New Zealand.

of the blackleg organism, and which caused confusion for many years between the two diseases, is first mentioned in the 1929-30 annual report of the Wallaceville Veterinary Laboratory. At this stage the modern type of blackleg vaccine was developed and proved effective.

Sheep Also Affected

By 1941 the number of calves vaccinated had dropped to 10,000 in Taranaki and 22,000 in Auckland Province. However, outbreaks still occurred among calves, there being 200 in Auckland Province in the year with 395 deaths. The November 1941 issue carried an article by M. B. Buddle, then Veterinary Research Officer (now Superintendent) at Wallaceville, which was to alter completely the previous conception of blackleg in New Zealand.

Up to this time it had been considered that the blackleg organism did not affect sheep and that deaths in sheep from "blood poisoning" following shearing injuries, dog bites, etc., were due to malignant oedema and not to the true blackleg organism. Buddle mentioned, however, that: "Observations over the last few years have indicated that true blackleg [in sheep] is apparently widespread throughout New Zealand, and it has been observed in districts where the disease has not been reported in cattle".

In describing the disease Buddle refers to possible confusion with malignant oedema and the necessity for correct bacterial diagnosis of the cause of the mortality. Vaccination with blackleg vaccine would have no effect against malignant oedema, but he says:

> When heavy annual losses from the disease occur on a property following castration and docking in lambs or following shearing, experiments have shown that these animals could be protected by vaccination carried out a fortnight before these operations.
>
> Vaccination has been shown to be very effective in preventing losses from a spontaneous form of the disease occurring in hoggets and is thus analagous to the disease in young cattle.

In the April 1944 "Journal" the veterinary notes gave further emphasis to blackleg in sheep by describing the characteristics of the disease and stressing the need for diagnosis by trained personnel. Since blackleg is similar in effect to anthrax, a disease fortunately rare in New Zealand and quite unknown in sheep here, and to tetanus as well as to "blood poisoning", it was necessary to be sure of the diagnosis before inoculation took place.

In 1944 the "Journal" announced that vaccination when warranted was done free by the Department. Because of the volume of vaccination this policy was soon to become inoperable.

Buddle's next article on the disease (the "Journal" April 1948) continued to press for urgent diagnosis of suspected outbreaks in sheep and to reiterate an essential factor in control of the disease:

> It is particularly important in the control of blackleg that the carcasses of animals which die from the disease should be deeply buried or burnt. As the organisms are present in great numbers in the carcass and in discharges, failure to dispose of the carcass properly perpetuates the disease on the property and intensifies its incidence.

Wise words, which had been repeated from the earliest days, but