

Marked clinical symptoms—photophobia, salivation, foaming, panting, clonic and tonic convulsions, ataxia, methæmoglobinuria—developed with all doses used (50 to 150 mgm. per kilo), but were severe about 65 mgm. per kilo.

In animals surviving the acute phase methæmoglobinuria, photophobia, poor grazing, and progressive loss of condition continued for varying lengths of time. Intense reaction also developed in the injected legs, producing gross swelling, lameness, and knuckling of the fetlocks which persisted as long as seven weeks in some animals.

The acute post-mortem picture was one of widespread breakdown of capillary permeability (pulmonary œdema, ecchymotic and petechial hæmorrhages, &c.) associated with circulatory collapse.

The sub-acute post-mortem picture showed regression of congestion, but progression of lesions in the gut and kidney, while fatty infiltration of the liver and jelly-like degeneration of the spleen became prominent.

After seven weeks macroscopic lesions had subsided, but microscopic lesions persisted in the heart, kidney, and liver.

The limiting factor in chronic B.A.L. dosing by the intramuscular route was found to be the intense local reaction. Systemically, 5 mgm. per kilo three times daily at four-hour intervals was well stood for three weeks.

A small number of experiments on the effect of B.A.L. on copper excretion in the sheep produced negative results. Included were analyses of livers after acute B.A.L. intoxication and of blood during chronic B.A.L. treatment. In a presumed enzootic icteric sheep an incomplete course of the dithiol failed to lower the copper level.

#### *Apiculture*

*Improvement of Strains of Bees by Artificial Insemination.*—This project, which has been commenced on a large scale at Wallaceville, entails inbreeding selected queens, then crossing the inbred strains to produce hybrids, and finally testing the hybrids and their progeny under practical conditions.

An association of breeders of queen bees has been formed to provide suitable stock on which to base the project and to furnish the necessary organization for testing strains of queens produced. Fifty queens donated by members of the association have provided all the stock at present being used in the insemination project.

During the past season inbreeding of queens reached the second generation and this phase of the project will be completed for large numbers of queens next season, when hybridization will commence. Inbreeding of queens by both mother-son and brother-sister systems was investigated. In the mother-son method, egg laying of virgin queens is stimulated by treatment with carbon dioxide. Drones can thus be obtained from virgin queens and later the virgin queens are fertilized with semen from their own drones. This method was found to give very unsatisfactory results, as the bees were very intolerant of drone-laying queens. The simpler brother-sister method, in which a virgin queen is mated with her brothers, was found to give much better results and will be used throughout the project.

It is estimated that at least five years will elapse before the insemination project reaches a stage at which it will be possible to supply queens to the beekeeping industry.

*The Toxicity of Chemical Weed-killers to Bees.*—These weed-killers, which may be of the hormone or non-hormone type, are being used to an increasing extent in New Zealand. The beekeeper is naturally concerned with the question of whether they will constitute a new threat to the industry by causing a heavy mortality in field bees. The many commercial preparations of hormone weed-killers at present on sale in New Zealand are all derived from 2, 4-D and M.C.P. acids. Tests have shown that these substances are not toxic to bees. Similar tests were applied to sodium dinitro-orthocresylate, a