Two cows given hydrocyanic acid in non-lethal doses did not bloat when placed on damp early-morning pasture at the laboratory. Also in picrate paper tests no excess H.C.N. was found in rumen contents of bloated animals.

During the short season that bloat was in evidence a large amount of preliminary analytical and bacteriological work of an exploratory nature was undertaken. Apparatus was devised for collecting samples of rumen gases from both normal and bloated cows for chemical analyses, and the results suggested that in cases of bloat there may be quite a wide deviation from the normal admixture of gases. Samples of rumen juice were also collected for bacteriological examination and pH estimations. The latter readings suggest that bloat may be associated with a decrease in the normal acidity of the rumen contents. By means of physostigmin injections large quantities of saliva were collected for in vitro digestion experiments of herbage from "healthy" and "bloating" pastures. A number of unexpected difficulties arose in the bacteriological work, but these were in large measure overcome by the end of the bloat season, and it is anticipated that in the coming year definite progress will be made.

Grass Staggers in Dairy Cows.

Dr. Cunningham has carried the investigation into this disease a little further. Dolomite-feeding has been found to be an effective and relatively cheap method of increasing the blood magnesium of cows, and experiments have therefore been arranged to ensure a supply of this material to animals on farms usually affected with grass staggers. Two and a half tons of ground dolomite have been distributed to five farmers; on two farms the dolomite was incorporated with the ensilage as it was made; on two farms the dolomite will be sprinkled on the ensilage as it is fed out to cows; and on the fifth farm, where no ensilage was made, dolomite will be used as a lick, and, with molasses, will be sprinkled on hay as it is fed out.

The results of these experiments will not be available until October or November of next year.

To investigate the possibility of increasing the magnesium content of pastures by manurial treatment with magnesium compounds sixteen plots were laid down in 1933 in a Latin square with four replications of the following treatments: (*a*) Epsom salts, 8 cwt./acre; (*b*) dolomite, 7·3 cwt./acre; (*c*) calcium carbonate, 4·4 cwt./acre; and (*d*) control. Eight further plots were subsequently added giving—(*a*) Epsom salts, 1 ton/acre; (*b*) Epsom salts, 2 tons/acre; (*c*) and (*h*) control; (*d*) and (*g*) super, 10 cwt./acre; (*e*) dolomite, 1 ton/acre; (*f*) dolomite, 2 tons/acre.

Three cuts have so far been made of the Latin square and one of the last eight plots, and the following average results are available:—

Manurial Treatment.	Percentage MgO on Dry Matter.		
	First Cut.	Second Cut.	Third Cut.
Epsom salts, 8 cwt./acre	0·586	0·587	0·468
Dolomite, 7·4 cwt./acre	0·503	0·518	0·453
Calcium carbonate, 4·4 cwt./acre	0·479	0·505	0·421
Control	0·496	0·499	0·400
			First Cut.
Epsom salts, 2 tons/acre	..	..	0·647
Dolomite, 2 tons/acre	..	..	0·426
Control	..	..	0·388
Super, 10 cwt./acre	..	..	0·361

Manurial treatment with magnesium will, therefore, increase the magnesium-content of the pasture, but the process could not be made a commercial possibility with the present prices of Epsom salts and dolomite.

A more thorough investigation is being made of the question whether magnesium deficiency is the cause of grass staggers. The work is proceeding along the following lines:—

(i) The examination of magnesium-content of milk and urines from affected animals to determine whether an abnormal exercition of magnesium occurs via these paths.

(ii) Examination of the magnesium-content of the bones and organs of affected animals.

(iii) Analyses of forage samples from affected areas and also of monthly analyses of pasture samples from four farms to determine the seasonal variation.

(iv) Attempted production of grass staggers in cows at Wallaceville by feeding rations low in magnesium.

It has been found that milks and bones have a normal magnesium-content while urines are very low in magnesium. Low urine magnesium correlates well with the low blood magnesium. Specimens other than bones have not yet been obtained from affected animals, but several series of organs from normal slaughterhouse animals have been analysed to serve as controls. Work on affected animals will proceed during the next season.

The results from the analyses of forage samples show that in the Waikato samples there is a general tendency for the magnesium-content to be lower than the usual figures. Spring grass in some instances contained as low as 0·3 per cent. magnesium, and ensilage samples are often even lower.

The seasonal variation in the magnesium-content of Waikato pasture is not marked, the lowest value being recorded in December, with increased values in the growth following February rains.

For the attempted production of grass staggers at Wallaceville, ensilage has been prepared from maize, which is low in magnesium. This ensilage will be fed to two cows for three months before calving, after which the animals will be given only green oats. These experimental conditions will impose the strain of magnesium deficiency on the cows during the last three months of pregnancy, while the green oats will stimulate the conditions of young-grass feeding in the grass staggers area. It should be mentioned that grass staggers has been recorded in Australia with oats feeding.

SHEEP-DISEASES.

Specimens for the year numbered 183, together with 244 blood samples for arthritis agglutination tests and 254 blood samples for biochemical examination. Many of the specimens have been gut contents from lambs to be tested for ovitoxicus toxins in connection with work at Lincoln Agricultural College by Mr. A. Leslie, F.R.C.V.S., brains for circling disease in sheep, parasite identification, wool rot, and mycotic dermatitis, enzootic icterus, &c.

Arthritis in Lambs.

A number of blood samples were collected through the agency of Inspectors of Stock and Veterinarians, but after collection it was found that the antigen prepared for agglutination tests was unsatisfactory. Many attempts were made to get a reliable antigen, but all except one batch failed. Results have therefore not been obtained.

This problem requires considerable attention, but must be commenced with post-mortem examination of lame young lambs.