

"The sheep died on the thirty-third, fifty-seventh, sixtieth, and seventy-seventh days after commencing the experiment, thus indicating the variable susceptibility of sheep to chronic-copper poisoning. In no case was there a welch-proliferation in the alimentary tract nor was toxin demonstrable by biological tests. The liver analyses for copper were 2,940, 4,030, 3,500, and 1,950 p.p.m. dry weight respectively. There is a marked similarity between these figures and those from natural cases of *Enzootic icterus*."

Parasitology.—Mr. W. V. Macfarlane has carried out parasitological work during the year on blow-fly control, cyst formation in sheep killed for export, and the feeding of Nematode larvæ in pure culture. In this latter work the effect of parasites on the nutrition of sheep, particularly on the strength and composition of bone, is being worked upon by the Nutrition Section, for field observations show a very definite change in bones in hoggets dying from parasitic gastro-enteritis. Several lambs have been brought up in crates, so that they are practically free from parasites, and these are being utilized for the work.

Blow-fly Strike in Sheep in Marlborough Province: Crutch strike with no relation to weather conditions is reported by Macfarlane to be due to vulval malformation and not to the scouring of the animal.

Wrinkle strike is also to be noted, but the main trouble in New Zealand is back strike, which occurs under suitable weather conditions in the autumn. It is associated with skin-irritation due to bacterial decomposition of yolk and surface layers of skin. Suggested control of fly strike in Marlborough is the control of fly population by trapping, efficient crutching, shearing and dipping, jetting, Mules operation where wrinkles are excessive, and breeding out of vulval deformities.

Cyst Formation in Sheep: Many sheep are found in slaughterhouses infested with small immature cysts throughout the musculature. The numbers appear to be increasing annually.

Puppies have therefore been fed the cysts where there is some hope of the cysts being viable. It is believed that the cysts are not those of *C. ovis* but of *C. tenuicollis*—and the feeding has been designed to prove the point. In examination of faeces from dogs in New Zealand by different workers, no *T. ovis* has been noticed. This feeding trial is in progress.

Liver Fluke: This parasite has been found on several properties in Otago. Examination of snails has not yet shown the presence of the cercariæ, and there is some idea that snails other than *Myxas* are carrying fluke. The point will receive further investigation.

SWINE DISEASES.

Diagnosis.—One hundred and forty-four specimens were received for examination; 40 were infected with *S. suispestifer*, 8 with *Pasteurellosis*, 3 with erysipelas, 5 with sarcoptic mange, and 2 with *Stephanurus dentatus*. One case suspicious of *Br. abortus suis* was noted but not positively confirmed. Abscesses in glands and musculature also occurred in fifty-four specimens. It is of interest to note that fewer cases of sarcoptic mange are now coming to hand, but that *Salmonella* infections are causative of the greatest mortalities in pig-farming. Eleven abscesses were put through bacteriological examination.

Two types of specimens call for careful field observations to prevent spread, these being swine erysipelas and *Stephanurus dentatus* infestation. Erysipelas has been a rarity as a pig disease in New Zealand, and that three cases should occur in one year is disturbing. Similarly, some cognizance should be taken of the finding of *Stephanurus*. While this parasite may not spread far on account of its warmth-requirements, yet it may become serious in North Auckland and Waikato districts.

Experimental work on pigs has been confined to zinc feeding and to nutrition in relation to male fertility (see Nutrition Section report).

Zinc-feeding Experiment.—In previous work reported in the 1936-37 report, 1 gram of zinc lactate per gallon had caused pronounced lesions in pigs receiving 1.5 gallons of skim-milk daily—i.e., a total of 1.5 grams of zinc lactate daily.

Two groups of two pigs received zinc lactate at the rate of 0.125 gram per gallon and 0.25 gram per gallon respectively. They received approximately 3 gallons of milk daily throughout. The pigs thrived and showed no ill effects following the receipt of zinc lactate as above from 22nd November, 1938, until 25th February, 1939, when they were killed and a post-mortem examination was made. Post-mortem, the pigs appeared normal and histologically no abnormality was observed.

Results of analysis of organs is not yet to hand.

POULTRY DISEASES.

Diagnosis.—Of 282 birds sent in for examination, 84 were diagnosed as being affected with coccidiosis, 45 with peritonitis following ruptured yolk-sac, 42 with leukæmia, 38 with B.W.D., 12 with intestinal parasites, 4 with tuberculosis, and 10 with pneumonia. Only two were diagnosed as affected with neurolymphomatosis.

It is pleasing to note the comparative freedom from tuberculosis of New Zealand poultry, which is reflected in a similar freedom from avian tuberculosis in cattle and pigs.

Pullorum Disease.—Mortality in chicks on several poultry-breeding plants revealed the presence of B.W.D. practically for the first time in New Zealand history. On two previous occasions at intervals of years small batches of chicks have shown B.W.D., and a test of a cross-section of hens from farms of origin of the eggs showed birds to be affected to the extent of about 2 per cent. The sudden occurrence this year of mortality in chicks was, therefore, surprising. Agglutination tests, using the whole-blood technique, of the flocks on farms where affected chicks were hatched has shown an agglutination reaction of from 10 per cent. to 50 per cent. of birds.