

- (b) The machine is likely to reduce costs of tile draining only if operated in conjunction with an efficient organization.
- (c) Its main attribute lies in the fact that it will increase the output per man per hour approximately eightfold, and that it will facilitate drainage operations by enabling the work to be carried out under dry conditions, when hand labour would be out of the question.

The introduction of the "Roteho" has, without doubt, been fully justified both from the point of view of the work it is doing at the moment and the fact that it has created considerable interest in the question of mechanical ditching for tile draining. This interest is certain to be followed by an increase in the use of machinery for draining wet land.

A full report on the "Roteho" and its cost of operation has been prepared.

A bulletin on farm drainage is in preparation.

RESEARCH ON THE INTERNAL PARASITES OF SHEEP

Mr. J. H. TETLEY

(a) Time has been devoted mostly to research on the seasonal incidence of parasites on pasture, with attention paid to possible fluctuations due to weather. This has been carried out chiefly upon lambs raised away from pasture in order to keep them free from parasites.

Animals have been put out on ordinary pasture and killed after a defined time, when the contents of the digestive tract are taken for examination. All the species of parasites formed in the stomach and intestines are dealt with.

(b) Apparatus has been built for work on the free-living stages of nematode parasites, beginning with the stomach worm, *Haemonchus contortus*. In the past, work has largely been confined to that part of the life-cycle which is spent inside sheep. What happens on the pasture has mostly been inferred. The parasites will now be studied by direct observation in controlled conditions in the laboratory.

BIOCHEMISTRY DEPARTMENT

Dr. C. R. BARNICOAT

Wear in Sheep's Teeth.—As part of a survey, ewe fairs have been visited in the Waikato, Gisborne, and Hastings districts. Observations have again been made on mouths of several hundred sheep (tagged and numbered) in the Taihape and Manawatu areas.

Too many Romney ewes' mouths tend to be undershot. Such mouths wear down quickly, particularly on country naturally "hard on teeth." Width of tooth is another fact: broad teeth last better than others.

District differences are not only caused by pasture deficiencies, but also by climatic differences and management factors. Soft succulent grasses in high-rainfall areas carry long, though not necessarily good, teeth. Close grazing naturally wears teeth down, but whether because of grit or the fibrous nature of the short feed is not yet clear.

Recording work is being continued, and chemical work on the composition of teeth has commenced.

Milk-supply of Romney Ewes.—A digestibility trial with the feed mixture used in last year's feeding experiments (high and low plane of nutrition in relation to milk-supply) has been carried out. No other experimental work was undertaken last season.

Vitamins in Meat (W. A. McGillivray).—Chemical methods for estimating water- and fat-soluble vitamins have been standardized and initial observations made with lambs fed on two extreme types of diet—indoors on hay and concentrates and outdoors on grass. The water-soluble vitamin contents of typical New Zealand lamb organs and muscle are of the same order as those reported elsewhere.