and a report is being prepared for publication. The use of the Cenco-Sheard spectrophotelometer and the Hilger quartz spectrograph for determining minute amounts of cobalt has been studied and a satisfactory technique worked out.

PARASITOLOGY

Blindness in Calves after Phenothiazine Dosing.—Investigations have been carried out on an inflammatory eye condition which has been reported quite frequently in calves after the administration of phenothiazine as a worm drench. The condition has not been reported from overseas, in spite of the fact that very large numbers of animals have been dosed with the drug. In New Zealand, however, it has occurred frequently and has become an important problem in some districts. It has been shown that the keratitis is a manifestation of a photosensitization in which the usual skin lesions are very slight or absent altogether, but in which the eye is sensitive. The eye lesions do not occur in dull weather or when animals are protected from direct sunlight. The critical period during which protection is necessary is the day following dosing. In practice the earliest warning of impending damage to the eye is weeping, and if, when this occurs, measures are taken to remove animals from sunlight, the severity of injury to the eye will be greatly reduced.

The use of phenothiazine in farming practice as an anthelmintic in sheep does not cause keratitis in these animals. Therefore, studies of the metabolism of phenothiazine have been made in sheep as well as in calves. Two derivatives, phenothiazine sulphoxide and phenothiazone, have been found regularly in the blood of calves, and the former has been detected in the aqueous humour. In sheep, when the drug is given in therapeutic amounts, usually the phenothiazone only is present in the blood and neither derivative is present in the aqueous humour; when massive doses are given to sheep, the sulphoxide also appears in the blood and aqueous humour, and in such cases keratitis is produced after exposure to sunlight.

The radiations which produce keratitis are in the long ultra-violet, 320 to 380μ, which is the region most strongly absorbed by the sulphoxide of phenothiazine. The responsible wave length differentiates the condition from "photophthalmia" as seen in snowblindness and so-called "flash injury" of electric arc welders, where the injurious wave lengths are shorter than 300μ. It is of interest that a carbon arc lamp with "sunshine" carbon poles was a suitable source of artificial light to produce eye lesions in susceptible animals.

The work so far completed indicates that the sulphoxide of phenothiazine is the photosensitizing agent. The sulphoxide has been found in the abomasum and other parts of the intestinal tract of calves and sheep, and its occurrence in blood and sometimes in the aqueous humour has already been mentioned. Further studies of the mechanism of its formation and of its metabolism and excretion are in progress.

Phenothiazine in Salt Lick.—A field experiment is in progress to examine the possibility of supplying phenothiazine incorporated in a salt lick. During the first season, lick consumption of a 1 : 9 mixture was very low and no benefit was recorded. During the present season lick consumption per sheep has been greater, but final results are not yet available.

Dipping Experiments.—Preliminary dipping experiments comparing D.D.T. and "666" with standard Derris and arsenic preparations for the control of keds and lice on sheep have been carried out. Against keds, broadly comparable results were obtained with D.D.T. 1/2,000, "666" 1/16,000, and Derris (5 per cent. Rotenone) 1/2,000, all of which were effective, although complete eradication was not obtained in any group at these concentrations. All were superior to a solution of sodium arsenite containing 0·2 per cent. arsenic.

Against biting lice, D.D.T. 1/2,000 and "666" 1/8,000 were both highly effective, but again these concentrations could not be relied upon to give complete eradication.

Resistance and Immunity.—Experiments have been initiated to study the phenomena of immunity and resistance to internal parasites in sheep. Artificial infestations are being used in lambs reared under worm-free conditions.