Teat-cup Vacuum: A special recording vacuum gauge and teat-cups have been made for the study of the vacuum changes right inside the inflation. This has been used in studying the effects of low- and high-line machine milking and in checking the action of moulded inflations. The new instrument has a small internal volume and so can give a precise indication of the changes inside the cups.

Milk Ejection Physiology.—Using an electric shock inhibition technique, evidence has been produced for the view that a cow can be stimulated to realease more than one lot of "let-down" hormone during a milking. This double let-down can be established as a result of conditioning, and the behaviour of "strippy" cows is explained in terms of a "double let-down" of milk.

Again using electric-shock inhibition, the "crawling" of the teat-cups up the teats to a degree which almost stops milk flow has been shown to occur before the milk is let down.

Film.—An educational film with sound track has been prepared in collaboration with the National Film Unit to assist in promoting efficient machine milking.

Cattle Disease Projects

Mastitis: Penicillin Treatment.—In a test with three injections at twenty-four-hour intervals of 25,000 units of penicillin in the form of penicillin cerate, 60 out of 90 quarters affected with clinical mastitis due to *Streptococcus agalactiae* showed clinical recovery and sterilization and a further 22 showed clinical recovery without sterilization. This is equivalent to a total of 90 per cent. clinical cure. These results are in line with those reported last year for penicillin in solution and mastic forms. Penicillin-cerate treatment has been very widely adopted in the industry, and reports show that it is giving very satisfactory results.

A field experiment has been conducted in collaboration with the Dairy Board and a number of veterinarians to test the efficacy of one tube of penicillin cerate containing 25,000 units injected at or after drying off. There are four groups of cows for which previous history of clinical mastitis is available. In group 1 all quarters affected during the season were treated; in group 2 all quarters in cows which had been affected during the season were treated; in group 3 all quarters of all cows were treated; in group 4 there was no treatment. It is hoped that the results, which are not yet available, will indicate the relative value of the various measures, both in the treatment of clinical cases and in the prevention of new cases by reducing the reservoir of infection.

The following results are available from smaller groups which were under more intensive observation:—

Fifty-five cows carrying latent infection of *Streptococcus agalactiae*, as determined by culture methods, were treated at drying off or while dry with one tube of 25,000 units of penicillin in the cerate form. Of these, 84 per cent. were clear of infection at calving and 73 per cent. remained clear for a further three months during which observations were continued. This compares well with the figure of 80 per cent. to 90 per cent. calving clear of infection last year, when treated in a similar way, but with three infusions of 25,000 units in the solution form.

It was possible to obtain reliable milk samples for cultural examination from 616 cows in eleven herds in which all quarters of all cows were treated at drying off or while dry with one tube of 25,000 units of penicillin. Only three herds calved down free of infection, the average incidence of cows infected in all herds being 4·8 per cent. and of quarters infected 1·4 per cent. Since the average normal rate of infection is approximately 24 per cent. of cows, it would appear that wholesale treatment of all dry cows with penicillin should substantially lower, though not eliminate, mastitis infection. It may be noted that the reduction from the average incidence figure of 24 per cent. to 4·8 per cent. suggests that approximately 80 per cent. of infected cows calved clear of infection, a figure which agrees closely with the more carefully-controlled work noted above.