Milking-machines.—The Characteristics of Combined Milk and Air Flow in the Milking-machine: The milk system of the machine involves problems of flow of both milk and air. This applies to the milk line, releaser, milk rubber, dropper tubes, claw pipes, and claw tubes. No precise information has existed on the characteristics of flow of both milk and air in these components, and manufacturers and farmers have speculated on the supposed ill or beneficial effects from incorrect size of pipes. Such speculations have often resulted in unnecessary complex alterations to machines, leading to inefficiency. Need exists also for a better understanding of flooding of low-line plants and releaser flooding of high lines. The information sought in these experiments is essential to efficient machine design.

The flow characteristics in all the components mentioned above have been systematically examined under conditions where the influence of some nine major modifying factors have been varied experimentally over the range normally found in milking practice.

The results have shown that many simple but highly significant points which have a bearing upon machine design have been largely overlooked or have received inadequate emphasis. Introduction of the modifications indicated will eliminate in both high- and low-line plants many of the difficulties at present encountered in machine milking. As a result of the work much more reliable recommendations can now be made in respect to size, number, and position of air-admission holes, pipe diameter, design of inlet to releaser, releaser design, capacity necessary in lift pumps, size of droppers, &c. Good machine design in this connection involves stability of air and milk flow, which has been shown to depend upon well-defined conditions: slope of milk line, size of air-admission hole, releaser inlet conditions, and level of milk in releaser and lift tank. A complete set of design data that has been worked out should be of considerable assistance to milking-machine manufacturers and servicemen.

Magnetic Pulsators: The piston-valve magnetic pulsator developed at Ruakura has now undergone a further year's test at No. 3 Dairy. The only weakness in design apparent is the spring arrangement. The improved model with a compression spring and adjusted to work on A.C. is to be installed in the new No. 5 Dairy. A full season's operation with a short-squeeze pulsator (20 : 80 ratio) has shown no sign of trouble due to congestion of the teats as suggested by the Minnesota workers. As the short squeeze was used on heavy moulded inflations as well as on the soft type, the test would indicate that this kind of pulsation is quite safe. A full report on the experiments will be available when the statistical work is complete.

Sight Glass: Metal prototypes of a plastic sight glass with a cut-off point at half a pound of milk a minute have been under test at Ruakura and on a commercial farm. The performance as a sight glass has been excellent. When used on a bucket plant the units need to be disassembled for cleaning, but when used on an ordinary machine cleaning is quite automatic and a test sight glass, after six months with no other attention than the standard caustic soda cleaning procedure, was found to be in excellent condition The glass will be available for farmer use for next season.

Relief Valves: Plastic damped weighted relief valves have now been in widespread use in the industry for more than six months in commercial sheds and the performance appears to exceed that of any other relief valves so far tested.

Cattle Disease Projects

Mastitis.—Herd Treatment With Penicillin at Drying Off: In 6 herds cows were treated at drying off with one tube per quarter of penicillin cerate containing 25,000 international units of penicillin. The teats, udders, and adjacent areas of cows were disinfected, penicillin-sulphadiazine cream was applied to teats, and the sheds and all fittings and equipment were also disinfected.