

lower efficiency than large ones. It is on account of these two disadvantages that the group method is used. To obtain the maximum economy with group drive, only similar machines, or machines with similar operating characteristics, should be grouped together. Of these machines only those which start up and shut down at the same time should be included in one group.

The chief advantage of group drive is that fewer motors are required, which reduces capital cost; also, the motors used are larger, and therefore more efficient. Machines which occupy a large floor-space relative to the power required by them should not be grouped, as the loss of power in belts and shafting more than offsets the increased efficiency of the motor; also, the capital cost of the belts, shafting, plummer-blocks, &c., more than offsets the reduced price per horsepower of the larger-sized motors.

Electricity for heating purposes in dairy factories does not show up to the same advantage as for power. In fact, in Southland, with its abundance of lignite easily mined, electricity for heating purposes on a large scale cannot compete. The reason is that £1 worth of coal contains vastly more heat-units than £1 worth of electricity. Small-size electrical-heating apparatus, such as electric kettles, are now made with the very high efficiency of 80 to 90 per cent., which enables electricity to compete favourably with such inefficient appliances as a cast-iron kettle heated on an ordinary fire. When, however, the more efficient system of heating by high-pressure steam is used, generated by an efficient steam boiler, the cost of heating by steam is considerably lower than by electricity. It must be remembered, however, that for heating small quantities of liquid electricity is probably the next cheapest source of energy, and also possesses the great advantage of being ready for use at any time of day or night, and may be automatically regulated.

At the present time the tendency in pasteurizing is to increase the speed with which the temperature of the milk is raised and lowered. Electricity would be capable of giving a higher temperature surface than steam, and therefore could be used more efficiently than steam in a flash pasteurizer. Another use of electricity in pasteurizing or sterilizing is at present being experimented with. It consists of exposing the milk to the action of the ultra-violet rays emitted by the mercury vapour electric lamps. These rays are chemically active, and produce an effect similar to sunburn if allowed to impinge upon the skin. Sunlight is one of the best sterilizing agents, and this artificial sunlight has a similar effect.

In conclusion, I suggest that the great advantages which may be derived by using electricity to operate dairy factories behoves all dairy companies within the electrically reticulated area to give earnest consideration to the electrification of their factories. There are thus great possibilities of future development in the application of electricity to dairying.

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*Registration of Nurseries.*—In the year 1922-23 560 nurseries were registered and inspected by the Department, and certificates issued, an increase of thirty-five as compared with the previous year; £560 was collected in registration fees.