

heating water for boiler-feed and washing-up purposes. A three-way cock will make it possible to use the exhaust for both purposes.

COOLING AND THE REFRIGERATING PLANT.

Economy in cream-cooling is a very much neglected point in many factories. The first cooler should be of such a size that the cream when leaving it is not more than 4° above the inlet water. If this result is not obtainable the cooler is not large enough, and work will be thrown on to the refrigerator unnecessarily. The second cooler must be large enough to allow of any temperature desired being obtained by regulating the flow of chilled water. The chilled water, if lower in temperature than the ordinary water, can then be pumped back to the chilled tank. The practice of filling a vat up with cream at a temperature as high as 70° to 80° and depending on the refrigerator to cool it is altogether too expensive and disastrous to quality when handling home-separator cream.

The refrigerator is perhaps the most neglected machine in the average factory. Too often there is more air than ammonia in the system, and if free from air the ammonia is deficient. In about nine cases out of ten where a machine is working badly air in the system is the cause, and in the tenth case it is usually a lack of sufficient ammonia. The refrigerator should be kept working at its full capacity, and if the work can be got through in eight hours it is a waste of steam to run it ten hours at less than it is capable of doing. Fifteen minutes spent in adjusting the valves in the morning may save two or three hours' refrigerating at the end of the day, and the fuel bill will be considerably lighter. The old theory that a machine works best at a certain back pressure, irrespective of the work in hand, dies hard. The back pressure must be regulated to correspond with the temperature of the material to be cooled. For example, a tank of brine at 65° may require a back pressure of 40 lb. to do the best work; but if the brine in the tank is at 40° , 15 lb. may be sufficient.

The common mistake is to work the dry-compression machines too hot and the wet-compression too cold. The former results in a too-small flow of ammonia, which takes up all the heat it is capable of absorbing before it has travelled far through the coils, and the heat on the compression side will be very high. In the second case, the flow being too great, the evaporation of the liquid is not completed by the time it gets through the coils. In other words, a portion of the ammonia which has passed through the coils has not been made use of. This reduces the capacity of the