storage badly handled, insulation counts a lot, but I haven't touched on this. Heat and moisture are the two worst enemies of cold storage, and it is up to the engineer to be able to control them at will.

There are many books written on this subject, but the ones that appeal to me most are by Wallis-Taylor, Hal Williams, Ewing's "Mechanical Production of Cold", and Andel's "Refrigeration and Practical Cold Storage," by Cooper. Other writers, such as Redwood and Hans Lorenz, are too heavy for the ordinary engineer. I have only mentioned the absorption system in detail, the other systems such as De La Vergne, the Freck, the Vilter, the York and the Linde would take an evening to themselves.

REFRIGERATION AND COLD STORAGE

In taking up the subject of Refrigeration and Cold Storage, perhaps it will not be out of place to give a brief history of the subject.

Refrigeration has been used at a very remote period.

The crudest form in refrigeration is found in the ancient plan of cooling water by evaporation, that is, by exposing water to the night air in shallow porous vessels. The vessels placed on a bed of straw in an exposed position filled with water to be frozen and in the morning provided the night be clear is found covered with ice. (Year 1755.)

Dr. Cullen is the first we have any trace of who discovered that the evaporation of water could be facilitated by the removal of atmospheric pressure, and he introduced a vacuum machine. This apparatus was the foundation of all the others for cooling off liquids by their own evaporation in vacuo.

Water was invariably employed for the process.

Water has a boiling point of 212° Fahr. at atmospheric pressure. A latent heat of vapour of 966.6 and a tension of vapour of 0·623 and having so high a boiling point it requires a vacuum of .089 per square inch to boil at a temperature of 32° Fahr., and consequently a vacuum at the very least as high as this must be maintained to produce ice by the vacuum process.

The next step we come to is in 1777, when Nairne found that by the introduction of sulphuric acid into a receiver for the exhaust, the aqueous vapour could be absorbed from the rarifed air, and by taking advantage of this he was enabled to construct a machine wherein he got rid of the vapour that rose from the water, and that prevented it from forming a permanent atmosphere and hindering the continuity of the operation.

Attempts were made by Leslie in 1810, Valance in 1824,