tical and lateral pressures, and that much the greater part of the grain load in the bin is carried by the walls, and only a small part on the bin bottom, and that this is due to the friction between the grain and the bin walls.

Very few, if any, have, however, realized to what extent this was governed by ratio of breadth to depth of bin, and the ratio of the horizontal area of the grain column to the area of the bin walls; and therefore to what extent the vertical and lateral pressures are increased, due to increase of horizontal dimensions of the bin.

This lack of data by which to calculate the pressures and strength of grain storage bins of varying dimensions and materials of construction, has been greatly felt by experienced grain elevator designers who have fully realized the importance of an ample factor of safety combined with economy of construction. It has therefore been rather surprising to find that some designers instead of conducting a series of tests to obtain the pressures produced by grain, which would enable them to intelligently proceed with their designs for bins of any dimensions, have built experimental tanks or bins at large expense, from which they gain very little practical information, since some parts of the construction when loaded may be strained far beyond its safe strength, and the weaknesses only be developed by time, while other parts may be of unnecessary strength. This may be called the "fit and try process," on which the wooden grain bin was originally developed and which was no doubt necessary in ancient times, but should now give place to modern engineering methods.

With an accurate knowledge of the pressures produced by grain and the necessary experience to enable the data to be intelligently used, and with the present knowledge of the strength of different materials of construction, there is no reason why a grain elevator may not be designed and built with the same regard to safety and economy as any other engineering work. It must however be borne in mind that while engineers may keep up with the times, their clients do not always do so, and that a structure actually built and in use, even if it has many weaknesses of which he is not aware, will often be selected by the prospective owner in preference to the most carefully prepared designs based on accurate data.

Most of the experienced elevator designers, knowing the very heavy loads that have to be carried in grain elevator or storage structures, have hesitated to depart from the standard sizes of bins, Unfortunately the demand for cheap storage and low insurance rates, has brought men into the field without either engineering knowledge or grain elevator experience, who have undertaken the design and construction of storage tanks apparently built by pure guess work, or at best, on some indefinite percentage of water pressure, with the