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POINTS IN BRICKS AND BRICK CONSTRUCTION

STANDARDIZATION OF BRICK IS TIMELY—LOSS OF STRENGTH IN BRICKWORK
DUE TO FROGS—LACK OF UNIFORMITY IN SIZES—CLASSIFICATION OF BRICKS
—BRICK MORTARS—SUGGESTED IMPROVEMENTS OVER PRESENT PRACTICE

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THE commonest building material used to-day in factory construction is the old-fashioned brick. The art of brick-making and brick-laying is a very ancient trade. One of the causes of trouble, according to Biblical record, between the Israelites and Egyptians had to do with the making of bricks, and from this we are at liberty to infer that brick-laying, as well as brick-making was a very ancient craft. Some of the oldest ruins of the Orient remain to-day as monuments of the skill of these men.

It follows, therefore, that when a student of present-day building materials discovers a desire to investigate all parts of his subject, he ought to be fully warned about the seriousness of tampering with history. The age of these ancient crafts and the history surrounding them, make the art of the brickmaker and bricklayer venerable and exempt from the invasion of recent learning. They seem to have been the barrier which has prevented the thorough examination such as all the newer materials have had to undergo in recent years.

Brick is the last of the commonest of the building materials to be standardized. The investigation and subsequent standardization of the brick crafts are being undertaken by the American Society for Testing Materials, and this society may be depended upon to carry on the work in the same thorough way that they have done in the case of steel and concrete.

The reasons for the present revision of the rules of brick-making and brick-laying is that present methods are uneconomical, inefficient and careless. The necessity of economical consideration is the result of the present tendency to build high buildings. The inefficiency is seen in the ineffective distribution of material; and the carelessness is everywhere evident in the business.

In recent years factory and office buildings have grown from the old three, four and five-story type to the present ten, fifteen and twenty-story buildings. If brick buildings were restricted to the old type there would be no pressing reason for a change. But office and factory buildings are so expensive to erect at present that prospective builders are compelled to give careful consideration to economy in their building material. A good brick building would suit a great many builders if designed on an economical principle, allowing an adequate factor of safety.

Economical designs are not now possible under our very conservative building by-laws. But the by-laws are not properly to blame, for back of them there are good and sufficient reasons for the conservation; and those reasons are the direct result of carelessness all through the brick-making and building trades.

In the last thirty years, the rules governing the use of all our building materials have undergone, or are undergoing, revision. Technical and economical considerations have led to new, more accurate and appropriate uses. Processes of manufacture are yearly improving the uniformity of most building materials. The result of these improvements is a more reliable material. The more reliable it is, the closer may the safe working

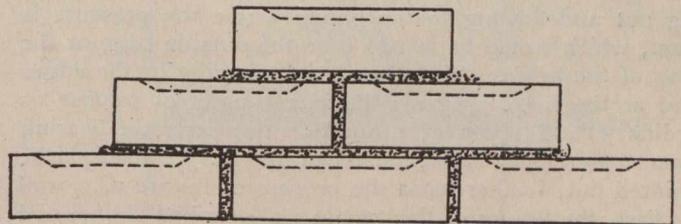


Fig. 1.

load be figured to the ultimate strength of the material. As a result of the above-mentioned improvements, safety factors are becoming more clearly defined and they will continue to diminish as materials improve in reliability.

The commonly accepted safety factor for steel is 4; for concrete, 5 to 6; for timber, 7+; and for brick, 10+. These empirics are an index of uniformity and reliability, and indicate in a general way the channels in which manufacturers have made the most progress. The high safety factor is very necessary in timber, owing to natural defects, such as knots, cross-graining, etc., but where a man commences with the raw material and makes a brick wall by his own process, it seems to be a misjudgment to lay the blame for all the defects of the resultant to natural causes.

The Effect of the Frog in Brickwork.—The first point at issue is the use of the frog in bricks. The commonly accepted theory, with regard to the frog in a brick, is that it is the bond which resists the possible horizontal shearing stresses. If Fig. 1 is examined, it will be seen