

**CEMENT AFFECTED BY FREEZING.**

It appears to be ascertained as a fact, based on more than six thousand recorded results, that Portland cement mortar suffers no surface disintegration under any condition of freezing, but that in most cases its strength is reduced, in some cases by as much as forty per cent. Rosendale cement is disintegrated when exposed to frost while setting, and its cohesion may be entirely destroyed by immersion in water, which becomes frozen around it. Salt water prevents this disintegration to a large extent, but seems to have an injurious effect upon the strength, and the cement below the disintegrated surface is stated to be increased in strength when the Rosendale cement is used. A mixture of a natural rock cement and of Portland cement is found to give very satisfactory results, as its surface does not disintegrate, and its strength is increased by the freezing. Portland cement is injured less proportionately as the percentage of the cement in the samples is reduced. Again, though lime mortar is ruined by alternate thawing and freezing, fairly good results may be looked for in the case of brick masonry when the mortar is kept frozen for some time after laying.—The Railway Review.

A striking instance of the durability of timber, under certain conditions, was afforded during the excavation for the foundation of the Bowling Green building, New York City. A line of spruce piles was discovered at some distance below the surface of the ground, which were placed in position about 150 years. These piles, upon examination, were found to be perfectly sound, and to all appearances would have been just as sound and good 150 years hence.

Sleepers embedded to the top either in concrete or sandy soil, and covered with a floor, will soon rot. If embedded only three-fourths of an inch, they will last long, and, if only laid on concrete, longer still, but in this case it is not easy to get them firmly embedded on the more

or less uneven surface of the concrete. The best plan we know of in such cases is to lay first on the concrete spruce strips one inch thick, and four or five inches wide, which have been well dried, and thoroughly coated all over with tar. The sleepers are then laid across these strips, at right angles with them, and the boarding nailed to the sleepers, and holes bored, a few inches apart, through the flooring, around the sides of the room. In this way a circulation of air is maintained in all directions under the floor. If the tarred strips are not more than two feet apart, the sleepers may be two inches thick. As to the spring of the floor, everything would depend on the span of

the beams or sleepers. It is an easy matter to calculate the deflection for any given case.

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