

in warehouses from which it was used exclusively for but one of his contracts, and which were located close to the site of the work, it was necessary to use only sufficient tags to identify each individual lot, as the inspector was able to visit the warehouse at frequent intervals, and thus keep under his personal supervision the work of removing the cement from storage.

Seven brands of Portland cement were used upon the work as follows: Speed, Western Lehigh, Kosmos, Bedford U.S., Alma, Superior and Old Dominion.

Rejections.—Of the whole number of carloads of cement tested, seventy-four, or about 9 per cent., were rejected for the following reasons:—

62 carloads for quick setting.

5 carloads for coarse grinding.

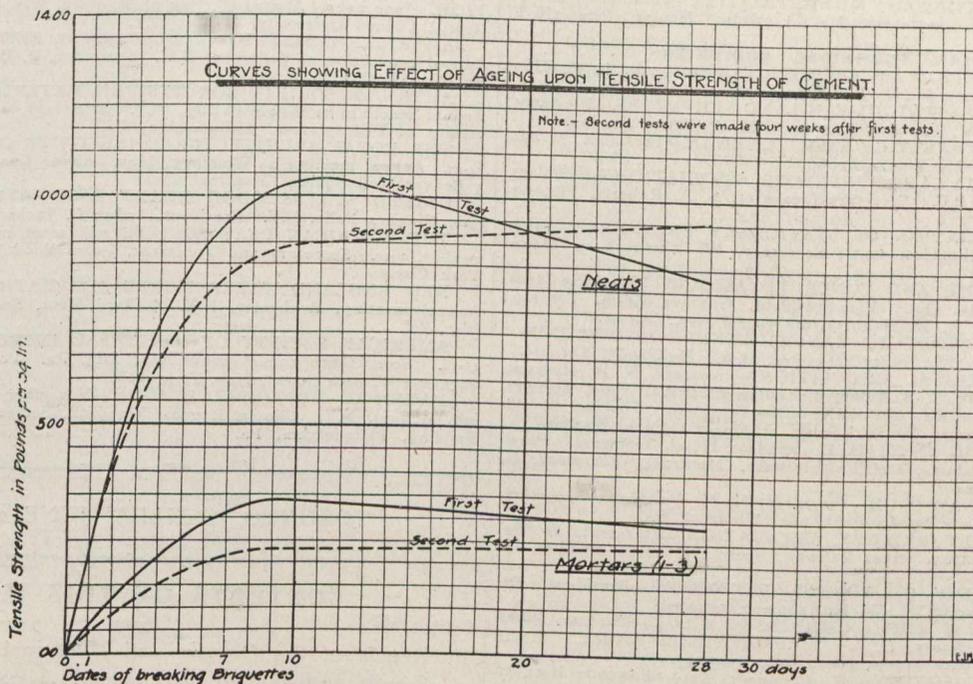
6 carloads for retrogression in strength.

1 carload for low specific gravity and excess of sulphuric anhydride.

In each case, when cement was indicated by the tests

which to acquire the initial set. This entire shipment was rejected, and a few tests were carried on afterward, one of which, two months later, showed that the cement was still unfit for use on account of the short time in which it acquired its initial set.

In view of the importance of uniform methods and proper conditions in the laboratory, special attention was given to securing uniform results of tests. Whenever an opportunity was afforded by a visit of an expert from the cement factories, during which he made tests, his work was duplicated by the regular laboratory force for the sake of comparing results. Table II. shows the results of a series of tests upon one brand of cement, the tests being made in duplicate, one by a representative from the mills, the other by an assistant in the laboratory. It will be seen from this table that in the main the results obtained by each tester varied within reasonable limits, and that those of the laboratory assistant and the representative of the mills agreed with each other fairly closely.



to be of inferior quality, duplicate tests were at once commenced to make sure that no errors had crept into the laboratory work. It was also customary to order retests whenever the results of tests appeared questionable, even though the results might warrant passing the cement. In some instances three or four additional tests were made at the request of the manufacturers whose representatives were always welcomed to observe the making of the duplicate tests, and to make such suggestions as they deemed pertinent.

The large number of rejections, due to quick setting, was apparently due to shipping of cement without due seasoning. While some of the samples gave a satisfactory test when brought to the laboratory, a rapid change went on, so that within a month after the arrival of the shipments they had so changed as to become quick-setting. In some cases samples of cement would set in as short a time as three or four minutes. The change that was going on within this cement is shown very clearly by tests of samples that were taken from different parts of the same bag in a number of instances. For example, a sample taken near the surface, which was more or less exposed to the atmosphere, set in six minutes, while another sample, taken from the centre of the same bag, required two hours and thirty-four minutes in

TABLE II.
Results of Duplicate Tensile Strength Mortar Tests.
(POUNDS).

A			Difference between Max. & Min.	B			Difference between Max & Min.	Difference between Averages.
7 days Mortar (1-3)				7 days Mortar (1-3)				
Av.	Max.	Min.		Av.	Max.	Min.		
397	420	375	45	288	307	270	37	109
272	281	203	18	283	293	273	20	11
278	292	255	37	291	297	285	12	13
390	400	380	20	246	260	232	28	144
272	283	261	22	283	312	255	57	11
226	34	218	16	316	345	287	58	90
296	303	290	13	219	283	265	18	77
263	285	251	34	263	272	253	19	..
270	281	260	21	266	270	263	7	4
320	325	240	45	266	270	263	7	54
Average			27				26	51

A—Represents Sewerage Commission cement tester.

B—Represents Cement Company's chemist.

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