authentic and unquestionable. This point of view is entirely wrong. I know of one case in particular,—a text book on reinforced concrete almost as big as a family Bible, written by two men neither of whom, I think, had actually carried out or been responsible for the carrying out, designing or supervision of any reinforced concrete work whatever. They were clever mathematicians and very good hands with scissors and paste. Generally speaking, one finds on investigation that the writers of text books on reinforced concrete construction have usually been responsible for only very few jobs. We at once realize, of course, that other writers have had most creditable experience, and we highly value their works. Of course, a large number of men who happen to be in possession of a $5 text book on reinforced concrete, consider themselves highly qualified reinforced concrete engineers by virtue of this text book, and one often comes across a considerable amount of work carried out by such people; hence more prejudice against reinforced concrete.

The experimental work of the United States Bureau of Standards and the Emergency Fleet Corporation are public property and open for the benefit of the world at large. These experiments have been conducted by independent parties and are absolutely unquestionable in their authenticity, and can be accepted without any qualms whatsoever. It is possible that millions of dollars can be saved in building and engineering construction throughout Canada by the proper revision of by-laws throughout the various cities with regard to reinforced concrete construction. An excellent opportunity exists at the present time for the formation of a special committee of reinforced concrete engineers to study the experimental data of the Emergency Fleet Corporation and United States Bureau of Standards, and to make proper recommendations to the various cities for changes in the various by-laws. Business men should be made acquainted with these changes and become familiar with the saving such changes would involve in construction, so that they can definitely demand that the building codes be revised. In these days, when the cost of construction has almost risen out of sight, and where millions of dollars' worth of work are being held up because of this high cost, and the manufacturing business in Canada is suffering severely from the situation, there is an urgent call for immediate action.

Accompanying is a table showing the stresses determined by the various authorities as shown. In the last line of the table the writer shows what he considers good value which would serve the public in the best manner possible to give combination of high efficiency and safety.

It must be realized in reinforced concrete that low stresses do not serve a particularly useful purpose to protect the public against poor workmanship. Designers are forced to design along certain lines in order to achieve the most economical results and yet pass the by-laws. The general tendency of these by-laws is to call for work with a large amount of concrete and small amount of steel, resulting in exceptionally heavy deadweight of structure. This does not necessarily protect the public, because, for instance, if concrete be entirely relied upon to take compression and shear stress, if by any manner of means any reversal of stress should take place, it would tend to introduce tension into a member instead of compression, and the structure would collapse if no steel were used at this particular point. If the designer used less concrete and put some steel in at this particular point, the structure would resist successfully considerable reversal of stress, and no trouble would arise. The designer would undoubtedly prefer to do this, but he would get little or no credit for such method of construction under present by-laws, and it would prove a more costly method of construction. So, under existing conditions, the public are not necessarily safeguarded by low stresses.

The arbitrary values for the bending moment in continuous and semi-continuous beams should be entirely abolished, and the bending moments used should be those which are the maximum that actually can occur in the structure. The arbitrary values given by the city of Toronto, the Joint Committee and the Ontario Railway and Municipal Board are as follows:—

PERMISSIBLE STRESSES IN REINFORCED CONCRETE AS SPECIFIED BY VARIOUS AUTHORITIES

	1:2:4 Concrete.					1:1½:3 Concrete.					1:1:2 Concrete.				
	Compr. in Beams.	Direct Compr.	Shear in Concrete.	Diag. Compr.	Hooped Cols. Lim. Concrete Stress.	Compr. in Beams.	Direct Compr.	Shear in Concrete.	Diag. Compr.	Hooped Cols. Lim. Concrete Stress.	Compr. in Beams.	Direct Compr.	Shear in Concrete.	Diag. Compr.	Hooped Cols. Lim. Concrete Stress.
Toronto by-laws (original) .	600	450	40	100	...	750	562	50	125	...	750	562	50	125	....
Toronto by-laws (concessions)	650	...	..	150	650	812	...	..	187	812	975	....	..	187	1,000
Joint Committee*	650	450	40	100	608	812	562	50	125	870	975	675	60	150	1,045
London County Council, 1915	600	600	60	180	800	675	675	67	202	900	750	750	75	225	1,000
Amer. Conc. Institute*	750	500	40	150	...	938	625	50	188	...	1,125	750	60	225	....
Emer. Fleet Corp.	...	...	..	...	...	...	...	..	...	...	1,500	1,000	50	500	....
Ont. Ry. & Mun. Board	600	500	40	120	...	650	550	45	120	...	650	550	45	120	....
Recommended by writer* ..	750	600	50	250	...	1,000	700	60	375	...	1,250	800	70	500	....

*With granite or trap-rock concrete, 10% higher stress values are allowed. Stress allowed in steel, 16,000 lbs. per sq. in. by all specifications excepting those of the Ontario Railway and Municipal Board, which allow only 15,000 lbs. per sq. in., although the steel is exactly the same as that for which they allow 16,000 lbs. when used in steel structures.

ARBITRARY BENDING MOMENTS

	Semi-continuous. Centre.	Support.	Continuous. Support.	Centre.
Toronto by-laws (original)	$+wl^2/9$	$-wl^2/9$	$-wl^2/10$	$+wl^2/10$
Toronto by-laws (concessions)	$+wl^2/10$	$-wl^2/10$	$-wl^2/12$	$+wl^2/12$
Joint committee	$+wl^2/10$	$-wl^2/10$	$-wl^2/12$	$+wl^2/12$
Ont. Ry. & Mun. Board	$+wl^2/10$	$-wl^2/10$	$-wl^2/12$	$+wl^2/12$
		$-wl^2/8$ if only two spans.		

Special attention should be given to the revision of the arbitrary restrictions defining:—

1. Load distribution in reinforced concrete.
2. Distribution of stress, such as the amount of slab acting as compression member in T-beam.
3. Impact.
4. Provision of proper reinforcement to take shear.
5. Anchorage of reinforcement, particularly shear members.

The above should all be properly revised for reinforced concrete, taking into account the monolithic nature of the material.

The only real solution for the safety of the public is that it should be made compulsory to employ a properly qualified reinforced concrete engineer to be made responsible for the design and supervision of construction on the site. He should be independent of the contractor, and he should not be interested in the merchandising of materials in any way. He should be permitted to design the work without any outside competition. It is essential that he should have had considerable experience in the design and supervision of reinforced concrete construction and that he should be thoroughly familiar with the experimental work and teachings of the Emergency Fleet Corporation and the United States Bureau of Standards.