By H. O. Hoffmann, Civil Engineer, Montreal,

Graduate of Polytechnic University of Zürich, Switzerland.

 XPERIMENTS which the writer has made lately in regard to construction in reinforced concrete and static analysis in general have prompted an elucidation of this matter from various points of view.

First of all, one is confronted with the fact that men who appear to hold some distinction in their profession are often decidedly in need of clearness as to the correct distribution of the forces in the individual members of a structure. In order to guard against any eventual accidents, many designers are led to exaggerate the proper dimensions, with the result that not only less economical forms are obtained, but generally, also, there is no certainty of producing a secure structure. nearly all cases, to very simple structures. These, being very often statically indeterminate, may be computed only by a trained calculator.

A designer who is not versed in the statical analysis invariably commits the very fault described above, thereby increasing the cost of erection without rendering the structure safe. One need only repeat the warning given by Mr. V. J. Elmont, A.M.Can.Soc.C.E., in August 28th, 1913, issue of *The Canadian Engineer*, page 361, which reads as follows:

"This proves once more that the approximate figuring usually employed by designers without knowledge of calculating statically indeterminate structures, is nothing less than a menace to safe construction."

Furthermore, there is a stubborn disinclination against the employment of the plain round steel bars, and though these are much cheaper and more easily handled, all kinds of expensive patented bars of twisted, corrugated,





This is one thing that tends to create prejudice against reinforced concrete as a reliable building material. Moreover, this method of tackling such problems is directly at variance with the whole science of the calculation of reinforced concrete structures, and hinders a due development which building in reinforced concrete has merited in other countries.

Careful studies in the designing of modern reinforced concrete structures have caused them to be classed as economical, since the specific qualities of the composing materials, concrete and steel, each in its place, are fully utilized. If these economical principles are neglected, reinforced concrete can never seriously compete against other building materials. To do justice to the proper designing of reinforced concrete, the designer must not rely only on a certain set of standard rules, as generally each construction requires an individual treatment in order to gain the most economical results, which in turn leads, in etc., forms are mostly preferred. It is not the purpose here, however, to discuss the necessity of the employment of patented bars, or to show that this is based on an absolutely faulty assumption, for it would only be a recapitulation of the very statements given in the book written by Professor Moersch, formerly Professor in the Swiss Polytechnical University, whose treatise on reinforced concrete is widely known and favored by American civil engineers.

The following example, taken from practical experience, will tend to prove that only a correct statical calculation may enable us to utilize the advantages of reinforced concrete and successfully compete against a structure of steel. Moreover, if specific qualities are demanded, such as fireproofness, the most favorable room capacity, speedy erection, unlimited durability, omission of expenses for maintenance, etc., structures in reinforced concrete may claim the distinction of combining these