calculations based (*a*) on a constant modulus of elasticity of concrete (*b*) on a variable modulus of elasticity of concrete. The justification of the introduction of the latter theory can therefore scarcely be tested by comparing its results with an experimental location of the neutral surface given by arbitrarily drawing a straight line between two points representing extreme tension and compression deformations. While believing firmly in the adaptability of reinforced concrete construction to a large variety of engineering problems, the author considers:

(1) That it is, in general, replacing materials of which our knowledge is more exact, having been gained by prolonged experience, and by careful experiment under conditions capable of being closely specified.

(2) That there are present in some applications of the newer form of construction, conditions which make for greater variations in the properties of the finished structure, than occur in the form of construction superseded. (Compare, for example, a reinforced concrete beam with a steel I beam of similar capacity.) These variations are inherent in the materials themselves, and in the methods and conditions of use.

(3) That the exact conditions of experimental investigation cannot be known as accurately in the case of reinforced concrete construction, as in the case of some of the types of construction which it is replacing, and that the degree of accuracy to which the results of the most careful experiments are applicable to practical conditions is, for similar reasons, less certain.

These conditions do not in any way militate against the successful application of reinforced construction to designs of a varied character, provided that a rational and conservative view be taken of the knowledge already gained by practical experience and experimental investigation. Their existence can scarcely be questioned, although the extent of the effects may be a matter of opinion. The apparent exactness and the complexity of many recent formulae suggest that they express closely the results of the most delicate physical experiments, rather than the results of tests of concrete beams. In the author's opinion these formulae have been built up on an inadequate experimental basis, and it is his belief that a study of the results of careful measurements of the actual strains throughout a beam section, such as have been described, should form the starting point for our theoretical considerations. When this is done, the law of linear straining will be found to be only approximately true. The retention of the law