

Transcribed Excerpts from "Physical Culture of Beams and Girders," May 12, 1904

Physical Culture of Beams and Girders

Beam Testing Apparatus of Massachusetts Institute of Technology Has Played Important Part in Modern Building Construction--How a Beam in a Laboratory is Made To Do the Work of a Beam in a Skyscraper

Boston, May 8.--What is essentially the most important part of the construction of any big modern building takes place before either the carpenter, mason or contractor begin their visible operations. This is the testing of the material to be used in order to see how well it will perform its part in the new structure...of any large and important modern building. All this, however, goes on quietly, often before the general public knows that the new structure is contemplated, and it is only within comparatively recent years that it has been reduced to what is practically an accurate science by means of which the contractor is able to know in advance the exact strength and endurance of each part of his building. The beam that supports a certain amount of floor area, for example, has its known maximum of endurance and is never expected to support a weight that will even approximate the breaking point. And every other part of the building is similarly tested.

Without such tests the modern skyscrapers would have been impossible because no man could have said how well the lower part of the structure would have withstood the weight of the many stories superimposed upon it. Every stick and stone, of course, is not tested individually. But representative samples of all forms of building materials are nowadays being constantly put on the rack, their strength and endurance tested under just the conditions in which this strength and endurance will be demanded by the actual building, and in just the shapes and sizes in which they are thus to become important and often invisible factors in the making of modern cities. In many cases therefore the birthplace of a modern building is the mechanical laboratory of a modern school of technology, and the new science of testing might almost be called a physical culture course for inanimate building materials...

It may be wondered why former methods of construction have never demanded a similar mechanism. The answer lies partly in the fact that no material is ever used to the limit of its endurance and that it is only with the erection of the lofty buildings of our own time, together with the greater use of steel and iron as well as wood that the question of what is actually the limit of a given piece of building material has become of vital importance. The great buildings of the past were stone structures [sic] and when wood was used it was used only in comparatively low buildings...

During the last few years similar tests have been frequently applied to irons imbedded in concrete--a new form of support that has come into use with the development of concrete-steel structures--and there are now some 40 or 50 pieces of material of this kind waiting for examination on the big testing machine...