NEELY'S FORMULA FOR THE STRENGTH OF WOODEN BEAMS.

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There is no department of Engineering Science, in which greater progress has been made during recent years, than in Timber Physics. This progress is chiefly due to the work of the United States Division of Forestry, which, by means of liberal government appropriations, has been able to conduct under the direction of Mr. B. E. Fernow, Chief of the Division, a series of investigations on the properties of timber, that for scientific excellence and fruitful results stands unrivalled in the history of timber testing. The feature that distinguishes these from other tests on timber, and is at the same time the cause of their pre-eminent value both for commercial use and in the advancement of science, is that the greatest care was taken to record and correlate the chemical, physical and mechanical properties, and also the life history of each specimen. Every factor in the condition or history of a specimen that might have an influence on the mechanical properties was carefully observed, and the amount of that influence made the subject of special investigation. By systematically eliminating the effect of each variation, the true relative values were obtained, results apparently discordant were found to harmonize, and order was brought out of chaos.

An account of the investigations is contained in the circulars and bulletins of the U. S. Division of Forestry,* the most valuable publications in the English Language, on the subject of Timber Testing. A few paragraphs will be quoted to indicate their scope and purpose.

From the Preliminary Report (Bulletin No. 6, 1892):—"There is one important factor of difference between other materials of construction and timber. It is the factor of life. Life means variety, change, variability. Each individual differs from every other in its development, and each part of the individual differs from its other parts in structure, and hence in qualities. Each living tree of the

*For list of these publications see page 208.