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Communications relating to the Editorial department should be addressed to the Editor, HENRY T. BOVEX, 31 McTavish Street, Montreal.

The Editor does not hold himself responsible for opinions expressed by his correspondents.

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## NEW BOOKS.

*The Materials of Engineering in three parts*, by Robert H. Thurston. (New York, John Wiley and Sons.)

*Part I.—Non-metallic Materials.* A correct knowledge as to the properties and strength of the materials of construction is absolutely necessary to the engineer and indeed to every one interested in the industrial arts. A work on the subject by a man of such eminence and authority as Prof. Thurston is everywhere recognized to be, cannot but be most heartily welcomed. Part I is now before us and is a compendium of valuable information. Chapter I. is devoted to the consideration of the various stones and cements, giving a summary of their most important characteristics.

Prof. Thurston then takes up the subject of timber, "that portion of the woody material of trees which is used in carpentry and joinery." After discussing the proper period for felling, both as regards the age of the tree and the season of the year, which is stated to be mid-summer or mid-winter, he passes on to describe five seasoning processes, viz., that of natural or air seasoning, of water seasoning, of steaming, of hot air seasoning, and of seasoning by boiling in oil. The characteristics of good timber are enumerated as follows:—"The heaviest is usually the strongest and most durable. That which has least sap or resin is the best. The freshly cut surfaces are firm and smooth, and the shavings are translucent, and should nowhere appear chalky or roughened, that being the first indication of decay. The annual rings should be closely packed, and the cellular tissue of the medullary rays should be hard and dense. The tissues should cohere firmly, and whereas sawn, there should be no wool-like fibre clogging the saw teeth. In general, the darker the colour, the stronger and more durable the wood." The causes of decay are then touched upon, and the remainder of the chapter is occupied by an illustrated description of the chief timbers (of which immense quantities are produced in our own forests) classified under the two heads of Leaf-woods and Pine-woods.

Chapter II is especially recommended to the careful consideration of the reader, as giving much and important information

as to the strength of timber. Prof. Thurston carefully defines what is meant by limit of elasticity, coefficient of elasticity, etc., gives numerous tables showing the resistance of timber to tensile, compressive, shearing, and transverse stresses, and explains their practical application by the aid of the standard formulæ. The tables are prepared from the results of the most recent and most reliable experiments, of which many were carried out by the author himself. On page 110 are Prof. Thurston's autographic strain-diagrams exhibiting all the mechanical properties of the more important woods. After an admirable summary of the conclusions relative to the application of timber to structural purposes and of the characteristics which specially distinguish the several woods, the chapter concludes with a concise account of the principal methods adopted for their preservation.

Chapter IV treats of the fuels used in Engineering and Metallurgy. They are considered with regard to their heating power, the quality of air required, the rate of combustion, their evaporative power, etc etc., and the requisites of an efficient furnace are carefully discussed.

Chapter V is an abridgment of Prof. Thurston's well known treatise on Friction and Lubrication, and the last chapter deals with miscellaneous materials, as leather, belting, etc.

An appendix contains tables comparing the metric system of weights, measures, etc., with that in use in Great Britain and the United States, and gives the First Report of the Committee (British) for the Selection and Nomenclature of Dynamical and Electrical Units.

The book is printed in clear type and is well got up.

*The Railroad Spiral*, by William H. Searles (New York; John Wiley and Sons, 1882).

The use of the cubical parabola in setting out railway curves with gradual changes of curvatures was first suggested by Mr. William Froude about 25 years ago, but a practical method of locating such curves on the ground has hitherto been wanting. The object of Mr. Searle's work is to supply this deficiency, and although it must be acknowledged that rail layers perform the easing of changes of curvature, with considerable accuracy by the eye, yet it cannot but be preferable to have fixed and reliable rules by which this operation may be effected. Mr. Searles starts by stating the objections to simple curves, then gives the theory of the spiral, exemplifying it by various elementary and special problems, and showing its application to field work. He concludes with a series of valuable tables. The book is of a convenient size for the pocket.