

4

SUMMARY OF COURSE OF INSTRUCTION IN CIVIL ENGINEERING.

1ST. CLASS.

SECTION I.

Nature, production and use of materials of construction.

(Common to Engineering and Architecture.)

SUB-SECTION (A)—MATERIALS, DESCRIPTIVE AND PROCESSES.

Building stones—Their classification, by constituent elements, rather than geologically, calcareous, argillaceous and siliceous, sandstones, limestones, granites, slates, traps.

Durability of stone—Exposure to frost, to heat, to city smoke, hardness, structure, free, granular, shelly, natural or quarry bed.

Making artificial stone—Ransomes process, concrete blocks, breakwater works of North Sea canal, brick clay, mixing, moulding, burning.

Limes—Air limes, water limes, cements, materials, physical characteristics of hydraulic limestones, calcination of limestones, lime kilns, fuel slaking of lime, sprinkling, drowning, immersion, manufacture of artificial hydraulic limes and cements, importance of uniformity of quality, manufacture of Portland cement, Roman mortar, puzzolanas.

Mortar—Sand, manipulation; proportions. Setting and durability of mortars. Theory of the hardening of mortar. Tests of the strength of mortars of lime or cement. Weights per struck bushel. Time required to harden.

Concrete—Of air lime; of cement. Ingredients, definite proportions, manipulations, applications; behavior under frost.

Woods—Age and season for felling, climate, soil, structure; sap wood, heart wood; seasoning in air, water, or steam; girdling.

Decay—Wet rot, dry rot; terredo worms.

Preservation—Ground line; free air current, wet situations; kyanising; creosoting.

SUB-SECTION (B)—STRENGTH OF MATERIALS.

Stress—Strain, Working load 'tests' set, Factors of safety, Modulus of Elasticity.

Tension—Law; experiments; tables; various woods; irons, steel.

Direct Compression—Law; experiments; tables; various woods, irons, steels.

Compression resulting in cross-breaking or collapsing—Formulas; various woods, irons, steel; solid and hollow cross sections.