

the base, is less than the square on a side of the triangle, by the rectangle contained by the segments of the base.

XVIII. Find the side of a square equal to a given equilateral triangle.

XIX. If from a point without a circle two tangents be drawn, the straight line which joins the points of contact will be bisected at right angles by a line drawn from the centre to the point without the circle.

XX. Describe a circle which shall have its centre in a given straight line, touch another given line, and pass through a fixed point in the first given line.

XXI. If from any point in the diameter of a circle straight lines be drawn to the extremities of a parallel chord, the squares on these lines are together equal to the squares on the segments into which the diameter is divided.

XXII. In a given triangle, inscribe a parallelogram which shall be equal to one-half the triangle

XXIII. The square inscribed in a circle is equal to half the square inscribed about the same circle.

XXIV. If the alternate angles of a regular pentagon be joined, the figure formed by the intersection of the joining lines will itself be a regular pentagon.

Notices of Books.

"HINTS ON ARCHITECTURE AND MECHANICS." By John Tully, Architect and Civil Engineer.

This treatise is prepared for the use of students in architectural drawing and machinery, and is intended to be a service to those engaged as Carpenters and Millwrights, as well as for amateurs who may wish to obtain some insight into the proportions of the "Orders" without devoting too much time to the study of Architectural Works. It will also be found serviceable to the heads of schools in explaining the rudiments of Architecture to their pupils.

For sale at Rowsell's, Maclear's, and Edwards'. Toronto, 1864.

NEW ZEALAND EXHIBITION.

We have received a circular from John Morrison, Esq., office of the *New Zealand Government Agency*, No. 3 Adelaide Place, King William Street, London, requesting us to notice an accompanying programme of an exhibition proposed to be held in the City of Dunedin, Province of Otago, New Zealand; to open on the first Tuesday of January, 1865.

The articles to be exhibited will be divided into

sections of *Raw Materials, Machinery, Manufactures, and Fine Arts*, and will be open to competitors from all countries. We have no idea than any Canadians will send articles so great a distance for exhibition, but should they intend to do so, it will be necessary for them to communicate with the above-named agent.

USEFUL RECEIPTS.

Black Varnish for Flexible Surfaces.

Take of asphaltum, in coarse powder, 24 ounces, macerate in a flask for a day or two, with frequent shaking, in 21 fluid ounces of benzine. Decant the clear solution, and mix it with that of one or two ounces of manilla elemi, and one ounce of balsam copaiba in sufficient benzine; if necessary add more benzine to get the proper consistence.

Copper, Oxide of.

Heat to redness nitrate of copper; it is decomposed, and becomes the oxide, or *protoxide*, of copper. Used to prepare oxygen gas.

Copper, Powdered.

Immerse zinc into an acid solution of sulphate of copper. The copper will be precipitated in a finely powdered state.

Damp Walls, Remedy for.

Dissolve gutta-percha in spirits of turpentine, mix with the solution ground white lead, and apply the composition with a brush.

Scouring Drops.

Oil of lemons and spirits of turpentine, of each equal parts. Used to remove grease.

To Dye Ivory.

Red.—1. Soak it in a weak solution of aquafortis, and immerse it in liquid carmine.

2. Boil it with Brazil wood, 1 lb., and water 1 gallon, then add alum 4 oz. and boil again.

Black.—Dip in a solution of nitrate of silver and expose to the light; or, first boil in galls and logwood, and then in iron liquor.

Green.—Dip in a solution of verdigris, to which a little aquafortis is added; or verdigris and vinegar.

Purple.—Boil in a decoction of logwood, then add alum 1 oz. to each quart, and boil again.

Yellow.—Steep in a saturated solution of orpiment in ammonia.

Blue.—Steep in a solution of salts of tartar and sulphate of indigo.

To Bleach Gutta-percha.

Dissolve gutta-percha (one part) in 20 parts of hot benzole, shake the solution with one-tenth part of freshly-calcedined plaster, and set aside, with occasional agitation, for two days. The clear, pale, brownish-yellow liquid is then decanted into another vessel containing double its bulk of alcohol fortius, when the gutta will be precipitated in the form of a brilliantly white tenacious mass, which is pounded together in a mortar, and rolled into cylindrical sticks.