

strength of a timber, not only by reason of their own area, but also because of the cross grain thus formed. Black or dead knots form an additional danger by reason of their decay and the possibility of its transmission to the rest of the wood. I need hardly add that the white wood or burnum of trees should be rejected in all cases, it being imperfectly formed fibre without strength or lasting qualities.

Great consideration is to be given to the kinds of wood most suitable for different building purposes. For positions where durability is the principal consideration, such as piles, foundation planking or other substructure, the decision will largely depend upon whether the place be wet or dry or subject to alternations of the same. In positions constantly wet, oak has been known to remain perfectly sound for hundreds of years, whereas if it be exposed to alternations of wet and dry, a few years will accomplish its destruction. Chestnut, while not as strong as oak, stands variations of damp and dryness very much better. This is especially the case with timber cut from comparatively young trees. Wood of this description has been known to last in trying positions over 50 years. Pitch pine also is very valuable for such positions, its highly resinous nature forming an excellent preservative. The larch is exceedingly durable, and is very valuable as post piles or sleepers. But probably the prince of woods for such positions is the red cedar, when cut from a healthy live tree. If the purpose be simply for piling or hydraulic works constantly subject to water, the elm will be found very durable.

When the strength required is largely compressive in a transverse direction to the grain, such as in templates and other bearings, the relative value of our more common woods may be placed in order as follows: Black and yellow locust; sugar maple; ordinary scrub and swamp oak; hickory and ash. While lower down in the scale of values are birch, sycamore, cherry, ordinary maple and Georgia pine. Where, however, these templates or bearings are exposed to the adverse action of damp and dryness, or where they are built up in a wall, the permanent properties of the woods need quite as much consideration as their sustaining strength. Where the properties required are mostly of compressive strength in the direction of the grain of the wood, such as in posts, the relative values of the woods in order of merit are as follows: In that order of merit are beech, sugar maple and black cherry, ash, rock elm, ordinary oak, pitch pine, white and red maple, red cedar, white pine, spruce and hemlock. The degree and manner of seasoning will, however, determine the relative values of some of these woods. Well seasoned woods resist crushing strains nearly twice as well as green woods. Where the strength needed is transverse, such as in beams and joists, from conflicting authorities I have endeavored to arrange the following in that order of merit: Birch, beech, Georgia pine, ash, oak, birch, hickory, maple, spruce, elm, yellow pine, white pine and hemlock. In such positions the straightness of grain, the uniformity of fibre and the freshness and density of the wood, form very important factors. Where the force applied is a shearing strain, such as in roof framing, trussing, &c., the more valuable woods are white oak, pitch pine, spruce and resinous pine. Where the weight is supported by tensile strain, such as in king posts, locust, ash, birch, alder, chestnut, elm, beech, hickory, maple and oak. Where wood is exposed to twisting or torsion strain, hickory, locust, white oak or ash. Besides these considerations of purely constructive strength, there are the effects of wear and tear to be considered, such as in floors, &c. Here a close grain as well as a hard texture is desirable, hence the valuable properties of maple, tamarac, birch and Georgia pine. Also the avoidance of those woods that splinter or raise in the grain such as hemlock, and others that decay rapidly when alternately wet and dry, such as oak and ash. Then, again, it is very necessary in exposed positions to avoid woods that curl and warp or are subject to great alternations of contraction or expansion. Some woods by reason of their non splintering qualities are very useful and may be relied upon for sink cappings, counter tops, and such places, ranging from the soft poplar up to the sycamore and walnut. Others are valuable for their insect resisting properties, such as red cedar for shelving, closets, &c. Indeed there is hardly any special position or requirement about a building, but demands the special allocation of some wood best adapted for the purpose.

In conclusion I might briefly refer to the very important subject of the preservation of timber. Of course the first requisite is thorough seasoning, as without this the application of any preservative is useless. The removal of the sap from the wood in order to prevent its fermentation and the consequent destruction of the fibres is the matter of most importance. Mere drying, particularly if it be done quickly, will not accomplish this, but may merely dry up the vegetable matter held in solution in the sap, and leave it there for future action in case of dampness or atmospheric influence. The lumberman's method of floating his logs to the mill has greatly assisted in the seasoning of our timber; the action especially of running water being very useful in washing out the sap. Continued saturation, however, has a tendency to greatly weaken the constructive strength of timber, so for carpenter work the wood should not be left long in the water. After the water has gradually dried out of timber, it may be subjected to the dry kiln; but wet or green lumber submitted to such a test warps and cracks in a discouraging manner. One disadvantage of kiln dried wood is the avidity with which it afterwards absorbs dampness from the air; so that where at all practicable, the old fashioned method of long stacking under cover but exposed to the free action of the air is to be preferred. Where possible, kiln dried stuff should be treated to a coat of paint or some other preservative immediately upon its being removed from the drying pile. The use of preservatives to timber is two-fold, viz., either by their presence to guard the natural juices having been expelled by thorough seasoning, to so close the pores of the wood as to prevent extraneous action; or in the case of protection against ants and worms the coating with some antagonizing substance. The chemical solutions most generally employed to saturate wood for its preservation are: corrosive sublimate, in the system called "Kyanizing"; chlorine of zinc according to Burnett's method; sulphate of iron and nitrate of lime, and also sulphate of zinc in combination with other substances. Each of these has some special feature of value, but along with it some serious objection. A Committee of the American Society of Civil Engineers after collating a large number of experiments, recommended Burettizing for damp exposures and Kyanizing for comparatively dry situations. The best known all round preservative is creosote oil, it fills the wood vessels, coagulates the albumen, prevents the absorption of moisture, is fatal to animal and vegetable life and so repels the attacks of insects or the growth of fungi. Unfortunately, however, its smell is so noxious that its use in a dwelling house is practically impossible.

A weak solution of lime has a decidedly preservative effect upon timbers, and may advantageously be used when the work to be preserved is exposed to a solution of rain. For exposed unpainted wood, resins dissolved in essential oils render wood impervious to water. For preservation of the surface of woods against the action of sun and rain, nothing perhaps is more valuable than alternate painting and sanding for two or three times; care being taken that a purely siliceous sand, clean and dry, is used. In conclusion I might reiterate the necessary caution, that wood should be perfectly dry before being treated with paint or any other preservative.

ONTARIO ASSOCIATION OF ARCHITECTS.

A FULL meeting of the Council was held in the rooms of the Architectural Sketch Club on May 7th. The proof of the By-laws, as revised, was submitted, and after some emendation was approved of in full. The By-laws will shortly be published. The curriculum and examinations for students were definitely settled. The following text books were approved:

1. HISTORY OF ARCHITECTURE STYLES AND ORDERS.
Gwilt's Encyclopedia (edition 1888) Fergusson's "History of Architecture," Stewart and Rivette's, Bohm's Edition, Chamber's "Civil Architecture"; Rickeman's and Bloxam's "Gothic Architecture"; Parker's Glossary; Parker's "Introduction to Gothic Architecture."
2. MOULDING AND ORNAMENT.
Paley's "Gothic Mouldings"; Brandon's "Analysis of Gothic Architecture."
3. DRAWING.
Architectural Perspective—F. A. Wright.
4. ELEMENTS OF CONSTRUCTION AND MATERIALS.
Reid's "Cements"; Clark's "Building Superintendence"; Wightwick's "Hints to Young Architects."
5. GRAPHIC STATICS, ETC.
Stoney's "Strains"; Kidder's "Architects' and Builders' Pocket-Book."
6. SANITARY SCIENCE, HEATING AND VENTILATION.
Baylis "Plumbing and House Drainage"; Baldwin's "Steam Heating"; Parke's "Manual of Practical Hygiene"; Billing's "Ventilation."
7. ARCHITECTURAL JURISPRUDENCE.
Gibbon's "Law of Contracts" (Weales series).

A copy of each text book will be deposited in the library of the Association. The following books were also recommended to be purchased for the library:

Stevenson's "House Architecture"; Viollet Le Duc's "Discourses on Architecture"; Viollet Le Duc's "Habitations of Men in all Ages"; Pugin's "True Principles of Gothic Architecture"; Pugin's "Apology for the Revival of Gothic Architecture"; Ricker's "Roof Trusses"; South Kensington "Notes on Building Construction"; Vignole's "Five Orders"; Parker's "A. B. C. of Gothic Architecture"; Osborne's "Notes on House Planning"; Jenkins' & Raymond's "Architects' Legal Hand-Book"; Taylor & Creasy's "Italian Architecture."

A Committee was appointed to select and purchase additional books for the library. Mr. W. A. Langton was appointed librarian.

It was decided that since at the last Convention a by-law was passed making the Association year begin on the 1st of January, and as many of those who registered prior to the passing of this by-law expected their registration fees to cover all dues to the 1st August, therefore these members who paid the fee for the year 1890 shall be required only to pay three-fifths of the annual fee for 1891.

At the last Convention of the Association, a resolution was passed requesting the Council to endeavor to ascertain the nature of the building stones in the Province, Prof. Galbraith having volunteered to co-operate with the Association in this matter by giving them the use of a testing machine at the School of Practical Science, a Committee was appointed to obtain the necessary specimens and conduct the experiments and to publish the results for the benefit of the Association.

A letter was read from Vancouver, B. C., requesting a copy of the By-laws and Act of Incorporation to assist in the formation of a similar Association in British Columbia.

The time for sending in designs for the Association seal was extended to July 1st, 1891, and the premium was fixed at \$25. Only registered architects are invited to compete, and no premium will be given unless the designs are approved by the Council.

In the matter of the Presbyterian Church Competition, as only two designs have been submitted, neither of sufficient merit to justify the Council in appointing a Committee to judge the designs, it was thought best to confer with the Board of the Presbyterian Church before taking further steps. There will probably be a new competition, which it is intended shall be brought to the notice of every member of the association by the Committee having the matter in hand, so that the competition may be taken up in a manner more worthy of the object.

It was decided that as the time for registration of practising architects has been already twice extended by the Council, no further applications for registration will be received unless accompanied by a certificate showing the applicant to have passed the examination required by the Act. The students who have registered will shortly be graded according to the length of time of service and every student will be notified of the examinations necessary to be passed by him and on what dates. A circular containing the curriculum, text books and other information necessary for students preparing themselves for examination will be sent to all students.

A Committee was appointed to draft conditions of competition.