

ARTISTIC, DOMESTIC, AND ECCLESIASTICAL

STAINED GLASS.

REDDING, BAIRD, & COMPANY,

83 Franklin Street, Boston, Mass.

Established 1848.

L. HABERSTROH & SON,

Mural Painters and Decorators.

THE "HABERSTROH" PROCESS FOR CEILINGS and WALLS.

9 Park Street, cor. Beacon, Boston.

FRAMES SUITABLE FOR ARCHITECTS' USE A SPECIALTY.

* **ARCHITECTURAL DRAWINGS** *

Mounted in the Best Manner and at Reasonable Prices.

WILLIAMS & EVERETT,

79 Boylston Street, Boston, Mass.

MAXIMÉ LALANNE'S

DRAWINGS IN

LA HOLLANDE A VOL D' OISEAU

Make this charming work of great value to all students of architectural rendering. Send for a circular describing the book.

TECHNOLOGY ARCHITECTURAL REVIEW.

EDWIN FORD. FREDERICK BROOKS.

PELHAM GLASS STUDIOS,

44 BOYLSTON STREET, BOSTON.

Memorial Windows, Glass Mosaics, Domestic Colored Glass.

Special Medal of Award, French Exposition, 1889; First Gold Medal for Domestic Glass, First Medal for Glass Mosaics, Exhibition Pennsylvania Museum of Art, Philadelphia, 1889.

PATENT STIFFENED

FIRE-PROOF WIRE LATHING.

The best surface upon which to plaster. It is more easily and rapidly applied than any other Wire Lathing. Plaster will not crack. Fire cannot spread. For discounts and particulars, apply to

NEW JERSEY WIRE CLOTH COMPANY,

TRENTON, NEW JERSEY.

THE NORTHWESTERN TERRA-COTTA CO.

MANUFACTURERS OF

ARCHITECTURAL TERRA-COTTA,

For EXTERIOR and INTERIOR DECORATIONS, from Special Designs, in all Colors.

Main Works and Office: Branch Works: Clybourn and Wrightwood Avenues. Corner 15th and Laflin Streets.

Branch Office: Room 1118, Rookery Building, CHICAGO.

N. WILSON & CO.

BOOK * BINDERS,

112 Beach Street, Boston, Mass.

All kinds of books bound. Architectural books mounted and bound with special care. Portfolios made to order.

WAITLAND ARMSTRONG & CO.

STAINED GLASS & DECORATIVE WORK.

Interior Decorations and Work in American Mosaic Glass from the designs of Mr. Armstrong. English painted glass from the designs of Messrs. Clayton & Bell.

Sole Agents for CLAYTON & BELL, Glass Stainers, London.

61 Washington Square, South, New York, N. Y.

J. & R. LAMB

59 CARMINE STREET NEW YORK

STAINED GLASS AND COLOR DECORATION

SKETCHES SUBMITTED EMBODYING THE ARCHITECT'S SUGGESTIONS FOR WORK OF THIS CHARACTER

WIRE LATH.

See advertisement on page vi.

VIGNOLE.

Edition of Garnier Frères, Paris, consisting of 72 steel-engraved plates, forming a complete treatise upon

THE FIVE ORDERS OF ARCHITECTURE.

Paper covers, price, post-paid, \$3.00. Technology Architectural Review.

GRANOLITHIC,

FOR

SIDEWALKS, BASEMENT FLOORS, CORRIDORS, RAILROAD PLATFORMS, ETC.

STUART & CO., EDINBURGH, SCOTLAND,

CHARLES HARRIS, Agent for New England,

OFFICE, 12 PEARL STREET, BOSTON.

School of Drawing and Painting.

MUSEUM OF FINE ARTS,

BOSTON.

The School Year begins Sept. 29, 1890. Classes from the cast and the living model, nude and draped. The Department of Decorative Design is of special value to architectural students.

For further information or circulars, address the School.

C. H. DUNTON & CO.

IMPORTERS OF FOREIGN PHOTOGRAPHS,

50 Boylston Street, Boston.

VIEWS, DETAILS OF ARCHITECTURE, Etc.

CATALOGUE MAILED FOR TEN CENTS.

BLUE PROCESS PAPERS.

"French Satin" is the only brand which is absolutely guaranteed by the manufacturers,

PHILADELPHIA BLUE PRINT CO.,

910 Filbert Street, Philadelphia, Pa.

Sample Books on request.

U. S. MAIL CHUTES

Should be planned for in a building in advance, as a vertical fall is imperative. The Chute must be in sight, and readily accessible, by order of Postmaster General. Architects should write for our drawings, etc., free.

CUTLER MANUF'G CO.

ROCHESTER, N. Y. SOLE MAKERS.

Pablo de Ségovie.

The most brilliantly illustrated work ever published. — JOSEPH PENNELL.

Technology Architectural Review

Circular upon application.

ESTABLISHED 1840.

JACKSON ARCHITECTURAL

IRON WORKS.

FOUNDRIES & SHOPS: EAST 28th & 29th STS., NEW YORK.

OFFICE: 315 EAST 28th STREET.

T. ASPINWALL & SON,

TILES OF EVERY DESCRIPTION, MOSAICS,

WOOD MANTELS, GRATES, OPEN FIREPLACES, IRON AND BRASS WORK.

303 Fifth Avenue, N. E. Cor. 31st Street, New York.

JOHANN FABER'S

SIBERIAN and POLYGRADE

LEAD PENCILS,

In all grades and degrees. The finest pencils made.

QUEEN & CO., Philadelphia,

SOLE AGENTS FOR U. S. A.

HERTER BROTHERS,

154 FIFTH AVE., NEW YORK.

ROMAN AND VENETIAN MOSAIC.

SKETCHES AND ESTIMATES FOR ALL MANNER OF MOSAICS, PROMPTLY SENT TO ARCHITECTS UPON APPLICATION.

FIGURE WORK IN ENAMEL OR MARBLE MOSAIC A SPECIALTY.

PRICES AS REASONABLE AS IN PARIS AND VENICE.

THE HOPSON CHAPIN MANUF'G CO.

MANUFACTURERS, ENGINEERS

OF

HIGH-GRADE HOT-WATER HEATING WORK,

NEW LONDON, CONN.

Warming by Ventilation (sometimes called "Indirect").

THE HOLTZER-CABOT ELECTRIC CO.

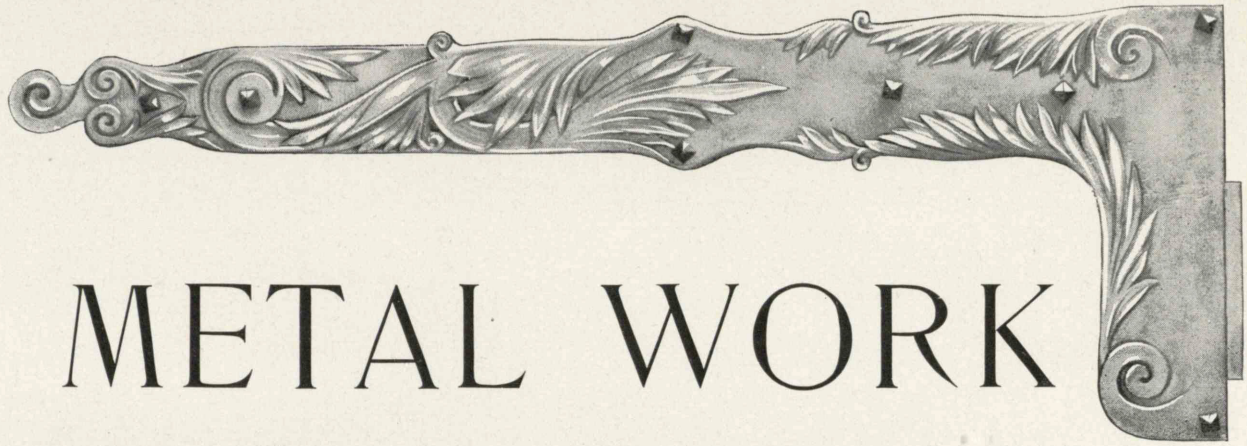
111 ARCH STREET, BOSTON.

ELECTRICAL CONSTRUCTION

OF EVERY VARIETY.

AUTHORIZED CONTRACTORS OF THE EDISON ILLUMINATING CO., BOSTON, FOR THE INSTALLATION OF THE INCANDESCENT LIGHT.

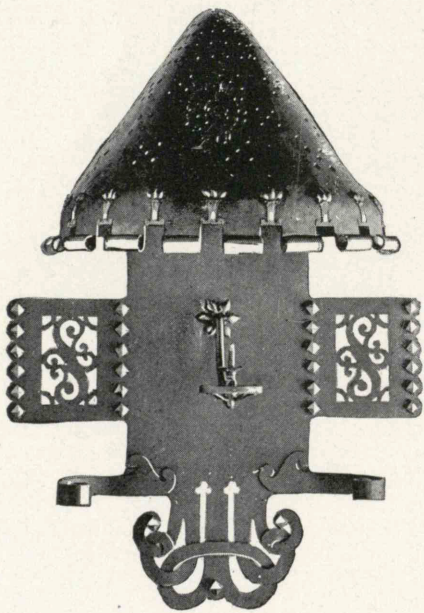
Estimates Furnished for Wiring Buildings in Process of Construction.



ART METAL WORK

For all purposes of Building Decoration, and Ornamentation.

ESCUTCHEON PLATES,
HINGE STRAPS,
HANDLES,
KEY PLATES,
KNOBS.



Cabinet Trimmings

in Many Artistic Ornamentations.

Special Subjects in Wrought Iron,

Brass, Bronze, or Aluminum.

THE YALE & TOWNE MANUFACTURING CO.

GENERAL OFFICES AND WORKS,

STAMFORD, CONN.

New York,
84-86 Chambers Street.

Chicago,
152-154 Wabash Avenue.

Philadelphia,
1120 Market Street.

Boston,
224 Franklin Street.

CHICAGO:
263 & 265 WABASH AVENUE.

Wadsworth, Howland, & Co.

BOSTON:
82 & 84 WASHINGTON STREET.

BAY STATE PAINTS, & W. H. & CO. LIQUID PAINTS,
In 45 Shades, for Interior and Exterior House Painting.
Wood Fillers, Varnishes, Japans, and Stains.
FINE COLORS OF ALL KINDS.

MANUFACTURERS OF

DRAUGHTING INSTRUMENTS OF ALL KINDS,
Drawing and Blue Process Papers, Curves, Scales,
Triangles, T Squares, Oil and Water Colors, Brushes,
ARTISTS' MATERIALS.

EXAMPLES OF LEAD PENCIL PAINTING.

Six Artist's Proofs, on Japan Paper, of the plates from our Brochure, "Examples of Lead Pencil Painting," from the beautiful drawings of old New England Buildings, by C. H. Woodbury. Price, postpaid, \$1.00.

BATES, KIMBALL & GUILD, BOSTON.

THE BEST
IS THE
CHEAPEST.



THE BEST
IS THE
CHEAPEST.

Architects should always specify Silver Lake Solid Braided Sash Cord.

On the next Slate Roof you specify, get our prices delivered. Upon receipt of sample nail we will

BORE AND COUNTERSINK

without extra charge. Never allow slates to be punched. Send for our "P. & P. Primer."

Monson Maine Slate Co.

113 Devonshire St., Boston, Mass.

THE HAMMOND TYPEWRITERS.

Send for Circular to
300 Washington Street, Boston, Mass.

FOR INFORMATION ABOUT

U. S. MAIL CHUTES,

Which are a necessity in Office Buildings and Hotels, write to the sole makers,

THE CUTLER M'F'G CO., ROCHESTER, N. Y.

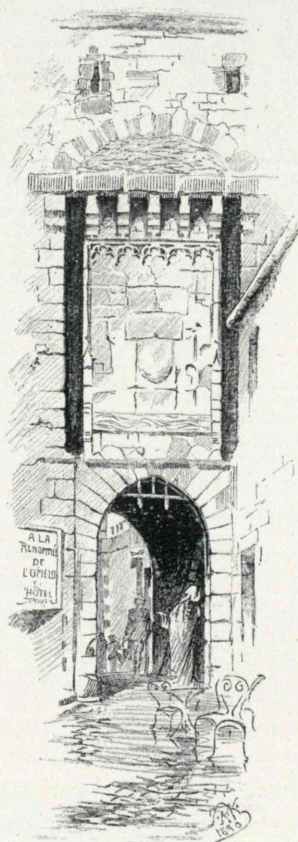
PATENTED. AUTHORIZED.

The Technology Quarterly,

REPRESENTATIVE OF THE WORK CARRIED ON AT THE
Massachusetts Institute of Technology.

Vol. III., published in February, May, August and November, 1890.

SUBSCRIPTION PRICE, \$2.00 PER YEAR.



OLD GATEWAY, MT. ST MICHEL, FRANCE.

CIRCULAR CATALOGUES OF SCIENTIFIC TEXT-BOOKS AND INDUSTRIAL WORKS.

We are issuing a series of Catalogues of Books on Scientific Subjects, published by ourselves, and which are now extensively used as Text-Books, and by practical men, and have now ready the following:—

- I. CIVIL ENGINEERING.
- II. MATERIALS OF ENGINEERING. Elasticity, Strength, etc.
- III. BRIDGES, ROOFS, TRUSSES, ARCHES, etc.
- IV. HYDRAULICS AND HYDRAULIC MOTORS, Water-Wheels, Wind-Mills, Drainage Service Pipe, etc.
- V. STEAM-ENGINES, BOILERS, LOCOMOTIVES, STEAM-HEATING, etc.
- VI. CHEMISTRY, ELECTRICITY, PHYSICS, etc.
- VII. MATHEMATICS, ASTRONOMY, etc.
- VIII. ASSAYING, METALLURGY, MINERALOGY, MINING, etc.
- IX. ART, DRAWING, PAINTING, ENGRAVING, etc.
- X. ARCHITECTURE, CARPENTRY, STAIR BUILDING, etc.
- XI. MECHANICS, MACHINERY, MANUFACTURES.
- XII. MILITARY AND NAVAL TEXT-BOOKS, etc.

These CATALOGUES contain from 22 to 75 pages each, with full titles of books, press and other notices, and descriptions of the same. They are neatly printed in paper covers, and will be sent free by mail to any one ordering them.

JOHN WILEY & SONS,

53 EAST TENTH STREET, NEW YORK.

Second door west of Broadway.

CLINTON WIRE LATH.

See advertisement on page vi.

BOOKS ON BUILDING AND THE ALLIED ARTS.

LATEST PUBLICATIONS:

Palliser's Court Houses, City Halls, Jails, etc.
Palliser's Common-Sense School Architecture.
Specification and Contract Blanks, etc.

Full Descriptive Lists mailed on application; also of all American and Foreign Building Journals, with club rates.

PALLISER, PALLISER & CO., 24 East 42d St., New York.

HENRY HUBER AND COMPANY,

Manufacturers of PLUMBING APPLIANCES for Public and Private Buildings.

"TIDAL WAVE," "GEYSER," "FLUME," "CASCADE," AND "TROMBE" WATER CLOSETS,
"NEW DEPARTURE" LAVATORIES, STANDARD URINALS, INDURATED FIBRE BATH TUBS,
AND DEALERS IN PLUMBING GOODS OF EVERY DESCRIPTION.

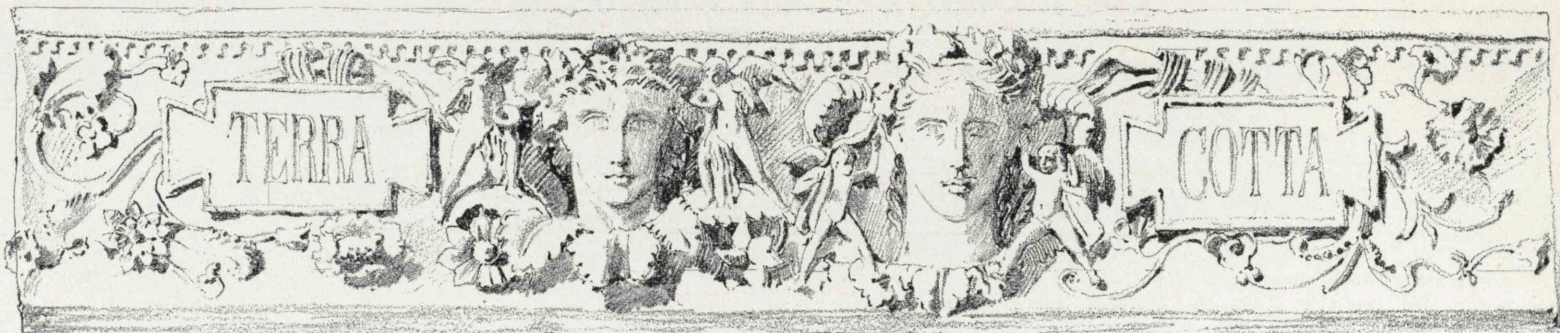
Our goods have been successfully introduced throughout the United States, and can be found in many of the leading Hotels, Commercial and Federal Buildings. For private use our Water Closets, Wash Basins, and Bath Tubs are unsurpassed in a sanitary point of view, and testimonials received speak in the highest terms of their excellent merits. We respectfully solicit correspondence from architects and others contemplating building, and shall be pleased to furnish our illustrated catalogues upon application.

SHOW ROOMS:

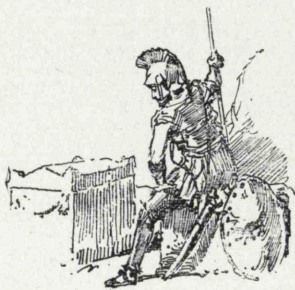
BOSTON,
17 Federal Street.

NEW YORK,
81 Beekman Street.

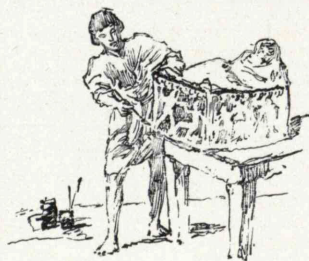
CHICAGO,
82 Dearborn Street.



CONTRIBUTED BY THE NEW YORK ARCHITECTURAL TERRA-COTTA CO.



The Etruscans used even more vivid coloring than did the Greeks, and, in common with all barbaric peoples, preferred yellows and brilliant reds. Their towns were small, and neighboring communities constantly menaced each other, so there was little of the comparative security which would allow commerce, or the working of quarries of marble or of other stone. The artisans, therefore, turned their attention to pottery and to bronze, and terra-cotta was an excellent material upon which to display brilliant pigments. Not only was it used as elsewhere for structural portions of buildings, but all ordinary utensils were made of it, and it was finally used to receive the remains of the men whom it had so well served during their lives. The sarcophagi of the Greeks were hewn from a single stone; those of the Etruscans were cast in terra-cotta. Some, that were more ambitious, had the carefully modelled works of artists upon



their lids, the recumbent figures of the dead, with an attempt at portraiture in the features, but by far the larger number were impressed by moulds, so that there were many replicas more or less crude, which differed from each other in coloring only. The sides and ends were usually decorated with mythical scenes, the sacrifice of Iphigenia and the mystery of Mithras occurring most frequently. Often the modelling was merely touched with vermilion, the color with which conquerors smeared themselves as emblematic of victory, and which played so large a part in the poly-

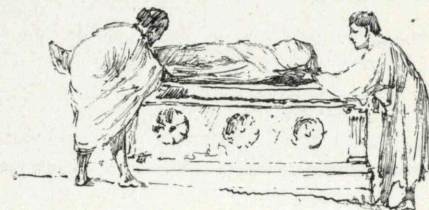
chromy of the past. The funeral rites of the Etruscans must have been unusually solemn. The tombs were excavated in tufa below the surface of the ground; and long, narrow staircases led downward apparently into the depths of the earth; at intervals, opposite each other on either side, were niches in which



while the procession slowly descended alternately in the torchlight and the darkness into the tomb chambers below. There terra-cotta Gorgon's heads leered from the walls, and a lamp of the same material swung from the ceiling by a leaden cord. The main chamber in the larger tombs, such as that in the environs of Perugia, was devoted to the funeral ceremonies, while all about it niches contained the sarcophagi of the different members of the family, each of terra-cotta, and each colored upon nearly its entire surface. The backgrounds of blue, the dull red of the flesh of the male figures, and the white of the female, the scarlets, yellows, and greens of the draperies, though crude when seen in strong light, must have been rich and decorative in their effect in dim light against the background of the niches. Doubtless there were emporiums for these sarcophagi, as there are tombstone marble yards to-day, and contiguous to the street of tombs of Veii were workshops where the terra-cottas were pressed into forms, baked and decorated, and where one might choose the future receptacle for his ashes.

In Asia Minor large terra-cotta vases were used as sarcophagi, such vases or jars as those for wine and oil. The body was doubled forward from the waist with the head between the knees in order to adapt it to the scant space, and the vase itself, slung upon long staves, was carried in the universal manner of carrying bur-

dens in the East. These vases were buried upright in the grounds. The columbaria, or rooms with little niches for small vases containing the ashes of the



dead, seem to have been used by the Romans more than by other nations. The funeral urns of the finest of baked clay were decorated by the best work of painters who were skilled artists, and whose very touch had character and force. And it was not alone with painting that these urns were decorated, but with bas-relief, with applied enamels and rich sculpture, so that some of them are of priceless value.

The terra-cotta urns, like all else in this imperishable material, remain better preserved than any of the later work in marble or in bronze. Many of the bronze forms are copied in the terra-cotta, which seems to have lent itself to subtle form equally well with metal itself. In the early works of art, skill seems to have been commensurate with the facility of working the material used, and bronze and terra-cotta attained a high degree of perfection long before marble or other stones were skilfully handled. In modelling the clay, the very curves caused by gravitation had a subtler line than those hewn out of stone, and it is to the freedom with which clay can be handled that terra-cotta owes much of its charm; a charm similar to that in an artist's sketch, where the material has been felt to be no obstacle to the thought.



[To be continued.]

SPECIAL IMPORTATIONS.

VIGNOLA; THE FIVE ORDERS OF ARCHITECTURE, in French and English. French, in paper, \$3.00; with translation, \$4.00; mounted and bound, \$5.00.

LA HOLLANDE A VOL D'OISEAU. This work is especially valuable to architectural draughtsmen on account of the illustrations by Maxime Lalanne, of whom Joseph Pennell writes: "To my mind, at least, Lalanne was one of the most exquisite and refined illustrators of architecture who ever lived. Perhaps the best, certainly the most complete example of his work is Havard's *La Hollande*." Large octavo, paper \$7.00

HISTOIRE DE PABLO DE SÉGOVIE. Illustrated with ninety-two drawings by DANIEL VIERGE. "A work which no one who cares about pen drawing should fail to possess."—*Pen Drawing and Pen Draughtsmen*, PENNELL. Small octavo, paper \$3.50

L'ORNEMENT POLYCHROME. Published under the direction of A. RACINET. First series, large quarto, 100 colored plates, containing about 2,000 motives, with explanatory notes. Price in boards, \$45.00. Second series, large quarto, 120 colored plates, comprising over 2,200 motives, with explanatory notes. In boards \$60.00

EDIFICES DE ROME MODERNE. PAUL LETAROUILLY. This is the *Morel* edition of this famous work, and should not be confounded with the cheaper and decidedly inferior reprints on sale. It consists of large folio volumes, containing 355 plates, a plan of Rome and portrait of the author, with about 800 pages of text. Large quarto, in paper. Plates in atlas. Price \$100.00

DICTIONNAIRE RAISONNE DE L'ARCHITECTURE FRANÇAISE. VIOLLET-LE-DUC. Ten octavo volumes (one a table of contents), illustrated with 3,745 engravings. Price, in paper \$90.00

FANTASIES DÉCORATIVES. HABERT-DYS. A collection of 48 colored plates; invaluable to every one engaged in color designing of any kind. Large quarto, boards. Price \$15.00

BIBLIOTHÈQUE DE L'ENSEIGNEMENT DES BEAUX-ARTS. A series of 32 octavo volumes, written by the highest authorities. Price per volume, bound in cloth \$1.25
Circulars with full information upon request.

DESSINS ET MODÈLES. A series of large octavo albums. Board covers, each \$2.00
Les Arts du Bois (Woodcarving, Furniture), 164 engravings. Les Arts du Feu (Ceramics, Glasswork, Enamel), 223 engravings. Les Arts du Métal (Goldsmith's work, Jewelry, Ironwork, Bronze), 200 engravings. *In preparation*: Les Arts du Tissu; La Peinture Décorative; La Sculpture Décorative.

DIE RENAISSANCE-ARCHITEKTUR ITALIENS. FR. PEYER IM HOF. Containing 135 beautifully drawn and carefully reproduced plates, of Italian Architecture of the best period of the Renaissance. Octavo, paper \$2.50

DER ORNAMENTENSCHATZ. A Grammar of Ornament, of all epochs of art. It contains 85 plates, mostly colored, comprising 1,200 motives, with explanatory notes. Small quarto, in cloth \$12.00

NOTES ON BUILDING CONSTRUCTION. Arranged under the direction of the Science and Art Department, South Kensington. Profusely illustrated. Medium octavo, cloth binding. Part I., \$3.50. Part II., \$3.50. Part III., \$6.50. Full information upon application.

HAND-BOOKS OF ARCHITECTURAL HISTORY. Volume I. Classic and Early Christian, by T. ROGER SMITH and JOHN SLATER. 200 engravings. Cloth, 8vo \$2.00
Volume II. Gothic and Renaissance, by T. ROGER SMITH and E. J. POYNTER. 100 engravings. Cloth, 8vo \$2.00

PERIODICALS. We make a specialty of the following periodicals, sending them *flat, to subscribers of the Review*, at these prices: The Architect, \$5.25. The Builder, \$5.25. The British Architect, \$5.25. The Building News, \$5.75. Raguinet, \$3.50. Croquis d'Architecture, \$6.00. La Semaine des Constructeurs, \$6.00. These prices subject to further reduction on club orders.

Full information in regard to any of the above by return mail, upon application. Correspondence solicited.

Having regular shipments from Paris and London, with the best facilities for buying in those cities, we solicit special orders for the purchase of any book, new or second hand.

BATES, KIMBALL & GUILD, Importers, BOSTON, MASS.

"Clinton" Double Twist Warp.
Clinton Stiffened.

WIRE LATH

Stanley Corrugated.
Stevens Rigid.

CLINTON WIRE CLOTH COMPANY,

Patentees and Sole Manufacturers of the above-named Lath.

MOST PERFECT AND ECONOMIC SYSTEM OF FIRE-PROOF CONSTRUCTION.

CEILINGS PLASTERED ON THIS LATH WILL NEVER CRACK.

SEND FOR CIRCULARS.

76 Beekman Street,
NEW YORK.

8 Congress Street,
BOSTON.

137 Lake Street,
CHICAGO.

Factory,
CLINTON, MASS.

SUPERIOR IN WORKMANSHIP, CONSTRUCTION, TEMPER AND FINISH. GENUINE ALTENEDER DRAWING INSTRUMENTS THE BEST MADE
T. ALTENEDER & SONS MANUFACTURERS, PHILADELPHIA. BEWARE OF INFERIOR IMITATIONS. CATALOGUE ON APPLICATION.

United States Sole Agents
For Albert Levy's Blue Process Papers.

FROST & ADAMS,
IMPORTERS & DEALERS
IN
Artists' Materials
of Every Description
MATHEMATICAL INSTRUMENTS,
ETCHING MATERIALS, TAPESTRY
CANVAS, COLORS Etc.

37 Cornhill,
BOSTON.

FS Frost
HA Lawrence

Blue Prints from
Tracings at Short Notice
a Specialty.

IVORY ENAMELITE

Is the only Varnish PALE ENOUGH to use over dead white for the old Colonial style of finish, and which will remain hard after drying. Another great desideratum in the preparation is that it can be rubbed to a dead or ivory finish.

It is made of a new variety of hard gum, which never gets sticky, and our best Decorators, who have used it for more than two years past, declare IT HAS NO PEER. It dries quickly.

CHICAGO VARNISH CO.

Established 1865.

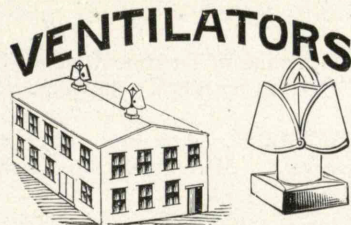
BOSTON:
Cor. Pearl and High Sts.

CHICAGO:
204 Pine Street.

"THE CAST SINK MUST GO."
THE COLUMBUS WROUGHT STEEL
SINK
DISPLACES ALL OTHERS.
PAINTED, GALVANIZED, ENAMELED.
SEND FOR DESCRIPTIVE CIRCULAR
AND PRICES TO

THE KILBOURNE & JACOBS M'FG'G CO.
SOLE MANUFACTURERS, COLUMBUS, O.

CLOTH PORTFOLIOS FOR VOLUME
TWO, POSTPAID, ONE DOLLAR.



Made of galvanized iron and copper. Strong upward draft. Exhausts foul air, odors, gases, steam, etc., from mills, stores, and dwellings; cures smoky chimneys. Perfectly storm-proof.
Galvanized iron and copper cornices and gutters. Sheet metal work for buildings. Send for illustrated circular.

E. VAN NOORDEN & CO.,
383 Harrison Avenue, - - Boston, Mass.



MENEELY & COMPANY,
WEST TROY, N. Y., BELLS,
For Churches, Schools, etc., also Chimes
and Peals. For more than half a century
noted for superiority over all others.

CLOTH PORTFOLIOS FOR VOLUME
THREE, POSTPAID, ONE DOLLAR.

Details of Decorative Sculpture.

Italian Renaissance.

*Fifty plates in a handsome portfolio, postpaid, two dollars.
Send for a circular giving a full description of the work.*

BATES, KIMBALL & GUILD - - BOSTON.

"MERCHANT'S ROOFING."

EVERY BOX GUARANTEED.
EVERY SHEET STAMPED WITH BRAND
AND THICKNESS.
NO WASTERS IMPORTED.

Protecting Architect, Property Owner and
Roofer.

MERCHANT & CO.

New York. Philadelphia. LONDON. Chicago. Kansas City.

Die Renaissance Architektur Italiens.

SPECIALLY IMPORTED

To supply a demand arising from the publication of our Details of Decorative Sculpture, for a companion work treating the Renaissance Architecture of Italy, in mass rather than in detail.

It consists of 135 plates, beautifully drawn and carefully reproduced, giving elevations, sections, and large details of the principal examples, with scale.

Large Octavo, in paper, price, post-paid, \$2.50.

Hand-Books of Architectural History.

VOL. I.

Classic and Early Christian. By Prof. T. ROGER SMITH and JOHN SLATER, B. A. Comprising the Egyptian, Assyrian, Greek, Roman, Byzantine, and Early Christian. Illustrated with 200 engravings.

VOL. II.

Gothic and Renaissance. By Prof. T. ROGER SMITH and EDWARD J. POYNTER, R.A. Showing the progress of Gothic and of Renaissance Architecture in Italy, France, Germany, England, and Spain. Illustrated with 100 engravings.

Each in cloth, 8vo, price, per volume, post-paid, \$2.00.

NOTE. Particular attention is called to the fact that these two histories have this year been adopted by Prof. Homer for his classes at the Massachusetts Institute of Technology, and at Lasell Seminary, superseding Fergusson's History, as a regular text-book.

BATES, KIMBALL & GUILD - - BOSTON, MASS.



500,000 H. P.

Babcock & Wilcox
Water-Tube Steam Boilers

ARE IN SERVICE.

Book on "STEAM," containing information of value to every Architect, sent free on application. Address,

107 HOPE STREET,
GLASGOW, SCOTLAND.

THE BABCOCK & WILCOX CO.

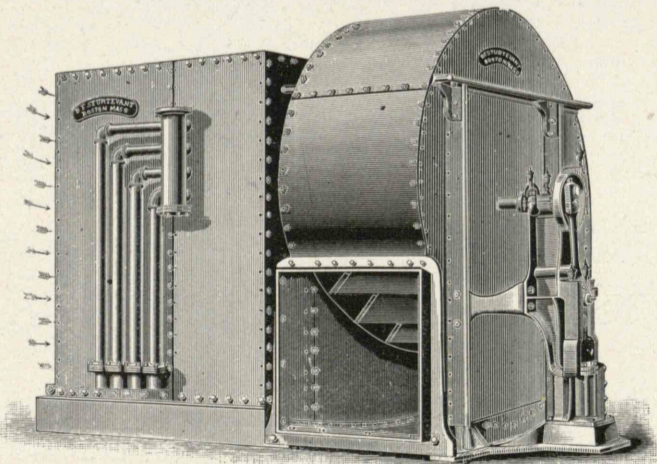
30 CORTLANDT STREET,
NEW YORK.

Some References for Architects.

COLUMBIA COLLEGE, New York. 400 H. P.
CORNELL UNIVERSITY, Ithaca, N. Y. 501 H. P.
NEW YORK PRODUCE EXCHANGE. 624 H. P.
GIRARD ESTATE, Philadelphia. 688 H. P.
NEW YORK LIFE INSURANCE Co. (various buildings). 1,513 H. P.
HOTEL PONCE DE LEON, San Augustine, Florida. 416 H. P.
DAKOTA APARTMENT HOUSE, New York. 864 H. P.
SENATE WING, U. S. CAPITOL, Washington, D. C. 312 H. P.
ASYLUMS, State of Indiana. 1,480 H. P.
NEW YORK STEAM COMPANY, New York. 13,482 H. P.
MASSACHUSETTS INSTITUTE TECHNOLOGY, Boston. 208 H. P.
NATIONAL LIBERAL CLUBS, London, England. 194 H. P.
EDISON ELECTRIC LIGHT COMPANIES. 18,000 H. P.
WESTINGHOUSE COMPANIES. 7,500 H. P.
LONDON ELECTRIC SUPPLY CORPORATION. 6,093 H. P.
VIENNA OPERA HOUSE. 1,192 H. P.

B. F. STURTEVANT'S STEAM HOT BLAST APPARATUS,

FOR HEATING AND VENTILATING BUILDINGS OF ALL CLASSES,
BY A FORCED CIRCULATION OF AIR.



Send for "ILLUSTRATED TREATISE ON VENTILATION AND HEATING." Please mention this paper.

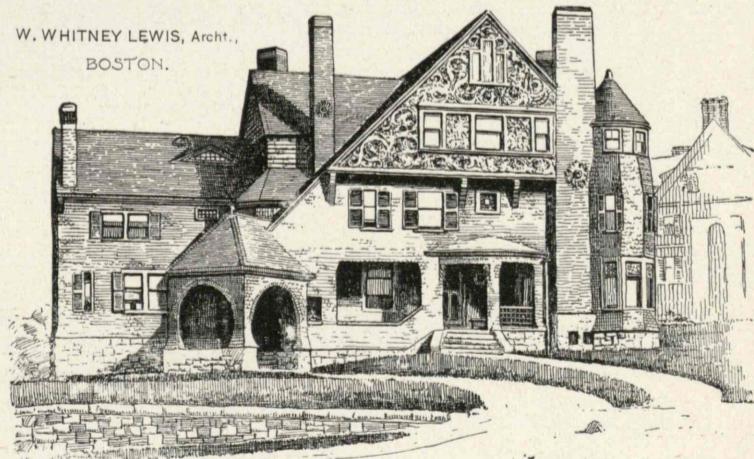
B. F. STURTEVANT,

BRANCHES: { 91 Liberty St., New York.
 { 31 No. Canal St., Chicago.

34 Oliver Street, BOSTON, Mass.

CABOT'S CREOSOTE SHINGLE STAINS.

W. WHITNEY LEWIS, Archt.,
BOSTON.



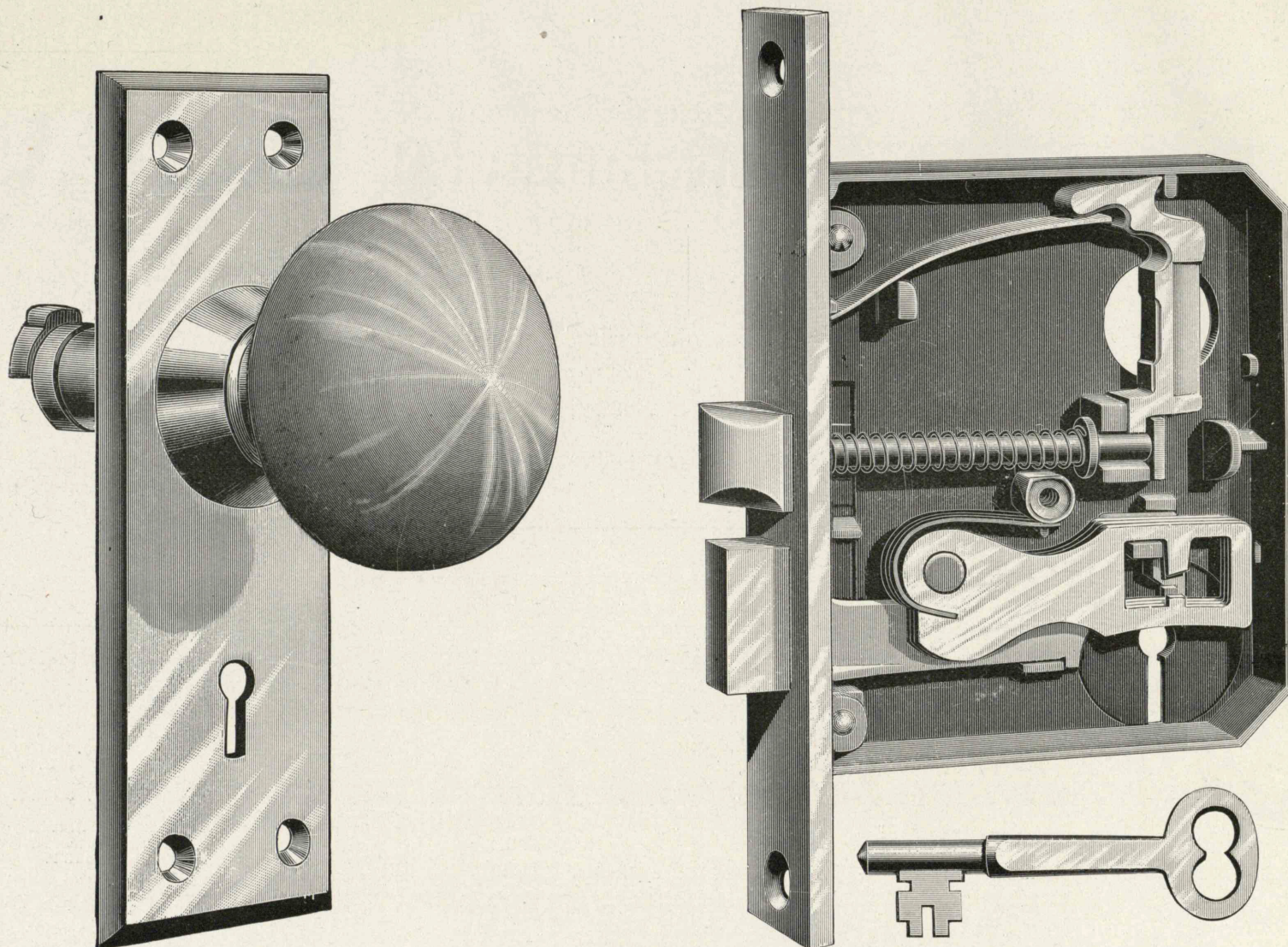
They have been used TEN years. They are the only ones that do not wash off, grow chalky, or turn black. They are the only ones that contain NO KEROSENE. Send for illustrated catalogue, showing a collection of actually creosoted houses.

Samples and circulars on application.

SAMUEL CABOT, Sole Manufacturer, 70 Kilby St., Boston, Mass.

DURABLE HARDWARE.

Locks and Knobs that are made in the same manner now as twenty-five years ago have the many objections that all are familiar with: loose knobs; loose knob screws; washers wearing out; knobs binding in doors (thus preventing latch-bolts from working), etc. Eight years ago the Niles Locks and Knobs were first made, and have now taken rank as the finest and most durable goods in the market. Note their advantages:—



NO HUB IN THE LOCK. Fewer parts and less wear in consequence.

NO SPINDLE ON THE KNOB. The knob works directly against the spring of the lock, thus making it always solid, with no loss of motion.

NO KNOB SCREWS. A fact that makes the absence of one cause of great annoyance apparent to every one.

KNOBS INDEPENDENT. This prevents the knobs from binding in the door, thus allowing the latch-bolt to always work freely.

NO WASHERS. Knobs fitted instantly to any thickness of door.

ROSES AND ESCUTCHEONS COMBINED. The screws always hold in solid wood, above and below the lock.

Nothing about the Niles Locks or Knobs will need repairs, with ordinary use, for at least ten years.

The severest test of the durability of a lock is seen in its use on Railroad Cars and Depots. An inquiry directed to the Chief Engineer of any of the large roads of the country will show that the Niles Locks and Knobs stand at the head of all competitors.

MADE BY THE

CHICAGO HARDWARE MANUFACTURING COMPANY.

OFFICES:

CHICAGO,
Chamber of Commerce.

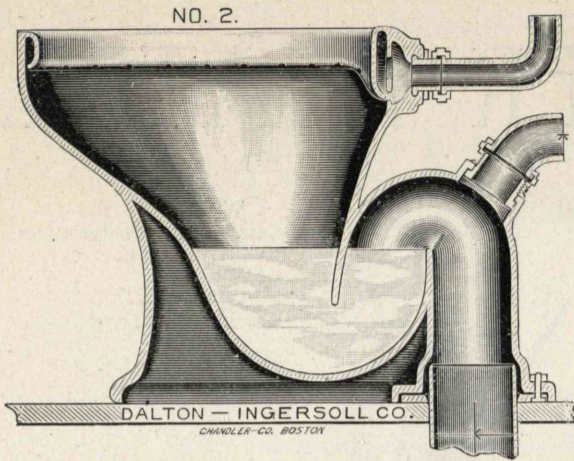
NEW YORK,
226 Stewart Building.

BOSTON,
38 & 39 Minot Building.

PHILADELPHIA,
502 & 503 Provident Building.

PITTSBURGH,
38 & 39 Schmidt Building.

GEO. J. WELLS, General Eastern Agent, Box 3514, BOSTON.



BOSTON HOPPER No. 2.

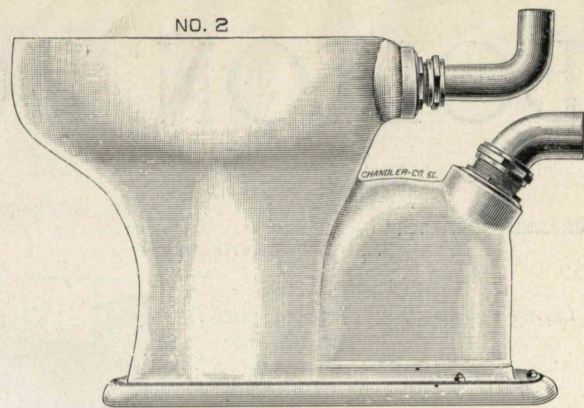
Architects,

Are you looking for a

Hopper Water Closet

that supports its seat, having a large surface of water and an absolutely air-tight (self-testing) joint at its connection with the soil pipe?

Please examine cut and send for catalogue and testimonials. Closets in use three years.



BOSTON HOPPER No. 2.

DALTON-INGERSOLL COMPANY - - BOSTON, MASS.

Amberg Cabinet Letter-File.

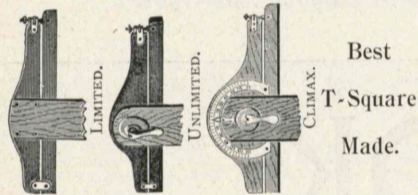
IT IS THE BEST.

Send for an Illustrated Catalogue.

AMBERG FILE-INDEX CO.,
79 and 81 DUANE ST., NEW YORK.

N. NUNN, Boston Agent, 23 DOANE ST.

DEANE'S PATENT ADJUSTABLE T-SQUARES.



For sale by dealers in all the principal cities. Circulars on application.

E. L. DEANE, Sole Manufacturer,
HOLYOKE, MASS.

CLINTON WIRE LATH.

See advertisement on page vi.

ROOFING.

GUM-ELASTIC ROOFING FELT costs only \$2.00 per 100 square feet. Makes a good roof for years, and any one can put it on. Send stamp for sample and full particulars.

GUM ELASTIC ROOFING CO.,
39 and 41 West Broadway - - New York.
Local Agents Wanted.

PEERLESS MORTAR COLORS,

BLACK, BROWN, BUFF AND RED.

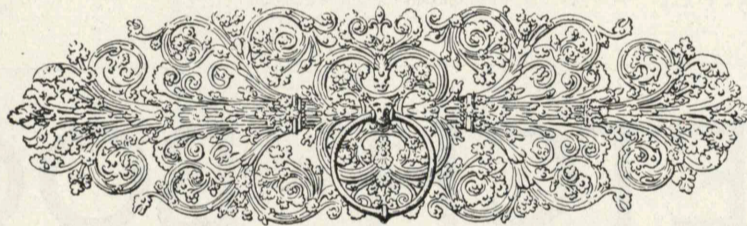
BRIGHTEST AND MOST DURABLE COLORS MANUFACTURED. Send for Circular.

SAMUEL H. FRENCH & Co., Paint Manufacturers,

Importers, Dealers and Manufacturers of

CEMENT, PLASTER, MASONS' AND BUILDING MATERIALS GENERALLY.

YORK AVENUE AND CALLOWHILL STREET, PHILADELPHIA, PA.

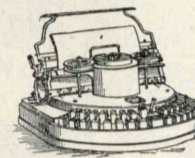


FROM THE DOOR TO THE CATHEDRAL OF NOTRE DAME, PARIS.

GRAPHITE PAINT.

FOR TIN OR SHINGLE ROOFS AND IRON WORK
IT IS ABSOLUTELY WITHOUT AN EQUAL.

A tin roof well painted will not need repainting for 10 to 15 years. If you need any paint it will pay you to send for circular. **JOSEPH DIXON CRUCIBLE CO., JERSEY CITY, N. J.**



THE HAMMOND TYPEWRITERS,

Awarded the Elliott-Cresson Gold Medal by the Franklin Institute of Pennsylvania.

The Hammond Typewriter Co.,

300 Washington St., Boston.

Stretch paper with *Taurine Mucilage*. You need not

Stand and Hold it.

It catches at once, dries quickly, and *sticks*. It contains no impurities or sediment. Sold under the guarantee of superiority in all respects. It is as good an article as *Higgins' American Drawing Ink*.

To Introduce

we will deliver, expressage free, anywhere in the U. S., within 1,000 miles of New York, a quart bottle with two empty stands and brushes for \$1.00. Mention the REVIEW.

CHARLES M. HIGGINS & CO.
168 Eighth St., Brooklyn, N. Y.

SOUTH KENSINGTON NOTES on BUILDING CONSTRUCTION. Part I., \$3.50; Part II., \$3.50; Part III., \$6.00.
Bates, Kimball & Guild, Boston.

DETAILS OF DECORATIVE SCULPTURE, ITALIAN RENAISSANCE.

LIST OF PLATES.

- FLORENCE.**
Pl. 1-8, Columns decorated in stucco, Courtyard of the Palazzo Vecchio.
Pl. 9, Cornice in the Hall of the 200, Palazzo Vecchio.
Pl. 10-14, From Pulpit in the Church of Santa Croce.
Pl. 15, Base of Marsuppini Monument, Church of Santa Croce.
Pl. 16, Casket of Marsuppini Monument, Church of Santa Croce.
Pl. 17, 18, From the Monument of Giovanni e Piero di Cosimo de Medici, S. Lorenzo.
Pl. 19, Capital from Courtyard of Palazzo Riccardi.
Pl. 20, Cap from Palazzo Gondi.
Pl. 21, Capital from Courtyard of Palazzo Gondi.
VENICE.
Pl. 22, Cap of Pier, top of Gian's Staircase, Ducal Palace.

- Pl. 23, Bracket from a Mantel in the Sala degli Scarlatti, Ducal Palace.
Pl. 24, From an Arch in the Church of St. John and St. Paul.
Pl. 25, Panel from Altar, St. Mark's.
Pl. 26, 27, Pilaster from the interior of the School of St. Mark.
Pl. 28, Pilaster in Choir of S. M. dei Miracoli.
Pl. 29, Cap of Pilaster in Choir of S. M. dei Miracoli.
Pl. 30, From an Arch in the Church of S. M. dei Miracoli.
Pl. 31, 32, From Pilasters in the Church of S. M. dei Miracoli.
Pl. 33, Pilaster at entrance of Church of S. M. dei Miracoli.
Pl. 34, From the Church of S. M. dei Miracoli.
Pl. 35, From Pilaster on Façade of Church of S. Giobbe.
Pl. 36, Capital and Entablature from the Church of S. Giobbe.
Pl. 37, Pilaster from Church of S. Michele.
Pl. 38, 39, Pilaster at entrance of Church of S. Michele.

- Pl. 40, Capital in Hall of Palazzo Zorni.
Pl. 41, From Entrance Door to the Jesuit Orphanage.

URBINO.

- Pl. 42-44, Capital from the Ducal Palace.
Pl. 45, Bracket from a Mantel in the Ducal Palace.
Pl. 46, From Frieze of Mantel in the Appartamento del Magnifico, Ducal Palace.
Pl. 47, Architrave and Frieze to a door in the Appartamento del Magnifico, Ducal Palace.
Pl. 48, From Frieze of the Porta Della Guerra, Ducal Palace.

LUCCA.

- Pl. 49, 50, From the Pulpit of the Cathedral.

50 7 x 9 Plates, reproducing photographically, from the originals, the best and most useful examples of Italian Renaissance detail.

PRICE, IN PORTFOLIO AND BOX, POSTPAID - - - - - \$2.00

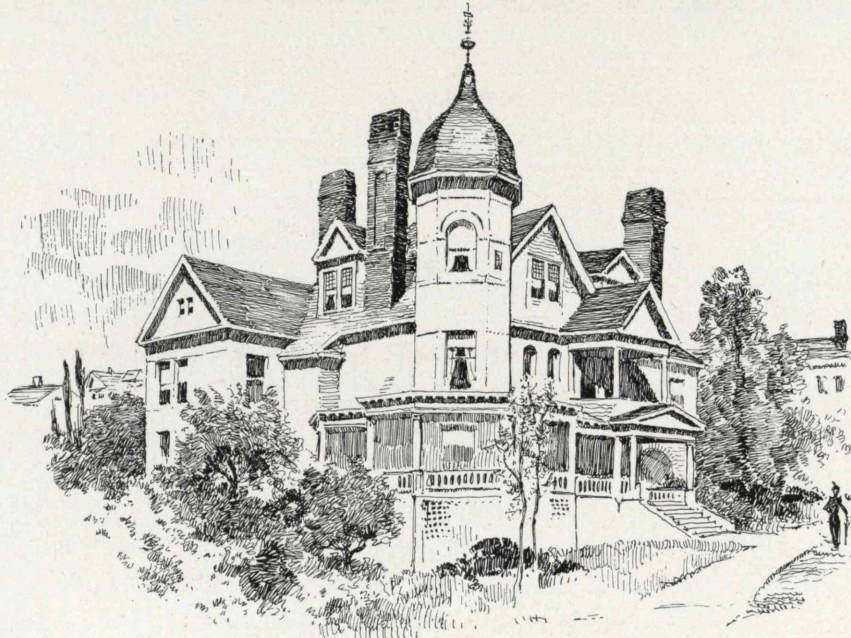
TECHNOLOGY ARCHITECTURAL REVIEW, BOSTON.

BOLTON HOT-WATER HEATER.

WARMS
DWELLINGS, SCHOOLS, GREEN-
HOUSES, HOSPITALS, ETC.

CANNOT
CAUSE FIRES OR EXPLOSIONS.

HAS THE
LARGEST FIRE SURFACE
IN PROPORTION TO
GRATE SURFACE.



RESIDENCE OF W. W. SPAULDING, ESQ., DULUTH, MINN. HEATED BY BOLTON HEATER.

CHEAPER
THAN STEAM OR HOT AIR.

MOST
CLEANLY, HEALTHFUL,
AND COMFORTABLE.

REQUIRES
LESS REPAIRS
AND LASTS LONGER.

DETROIT HEATING AND
LIGHTING COMPANY,

NEW YORK: 114 LIBERTY STREET.
BOSTON: 42 PEARL STREET.
CHICAGO: 88 LAKE STREET.
ST. LOUIS: 508 N. FOURTH STREET.
NEW ORLEANS: 28 UNION STREET.

FACTORY AND HOME OFFICE,
320 WIGHT STREET, DETROIT, MICH.

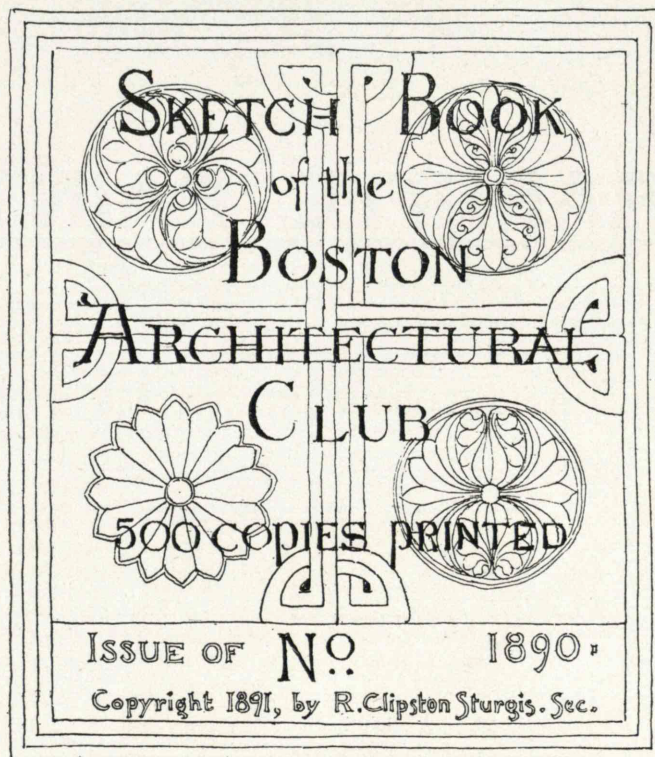
Send for "WARMTH FOR WINTER HOMES."

FORTY-FOUR DRAWINGS.

Contributors.

FRANCIS BACON,
HENRY BACON, Jr.,
C. H. BLACKALL,
A. W. BRUNNER,
WALTER COPE,
FRANK MILES DAY,
W. S. EAMES,
WILSON EYRE, Jr.,
J. C. GREEN,
JOHN GALEN HOWARD.

In Cloth Portfolio,
11 X 15 inches.



Contributors.

S. W. MEAD,
GEORGE F. NEWTON,
T. HENRY RANDALL,
DENMAN W. ROSS,
JOHN STEWARDSON,
R. CLIPSTON STURGIS,
S. B. P. TROWBRIDGE,
J. A. VAN STRAATEN, Jr.,
C. HOWARD WALKER,
E. M. WHEELWRIGHT.

Delivered Postpaid,
Price, \$5.00.

BATES, KIMBALL & GUILD - - BOSTON.

VIGNOLE:

The Five Orders of Architecture,

ACCORDING TO JACQUES BAROZZIO DE VIGNOLE.

TRANSLATED.

72 Plates, engraved on steel by Hibon. The standard edition of Garnier Frères, Paris, with full text in both French and English. The best edition ever published. Descriptive circular upon application. Sent postpaid on receipt of price, as follows:—

| | |
|---|--------|
| Original French Edition, with Translation, Glossary, etc.; plates mounted on cloth guards, and bound in cloth | \$5.00 |
| French Edition, with Translation interleaved, paper covers | 4.00 |
| French Edition alone | 3.00 |
| Translation alone | 1.00 |

BATES, KIMBALL & GUILD, - - BOSTON.

*“The Most Brilliantly Illustrated
Work Ever Published.”*

HISTOIRE DE PABLO DE SÉGOVIE,

Illustrated with 92 Drawings by

DANIEL VIERGE.

“Such an influence did this book have upon French pen drawing, that, after its publication, an entire school of pen draughtsmen, following Vierge, appeared, and their work was more clever than that of any other draughtsmen, though it did not equal the drawing of their master.”

“There is really very little to be said about Vierge's drawings except to advise the student to study them in the most thorough manner.”
—From *Pen Drawing and Pen Draughtsmen*, by JOSEPH PENNELL.

SENT POSTPAID TO ANY ADDRESS IN THE UNITED STATES OR CANADA, UPON RECEIPT OF \$3.50.

TECHNOLOGY ARCHITECTURAL REVIEW,
BOSTON, MASS.



MINERET IN THE ISLAND OF MYTELENE.

We have the following VIEWS of

THE WELD HOUSE,

JAMAICA PLAIN, MASS.

E. M. WHEELWRIGHT, Architect.

- | | |
|--------------------------------|------------------------------|
| 844. Parlor. | 844-h. Lower Hall Fireplace. |
| 844-a. Parlor Mantel. | 844-i. Stairway. |
| 844-b. Sitting Room. | 844-j. Billiard Room. |
| 844-c. Library. | 844-k. Bedroom Mantel. |
| 844-d. Dining Room. | 844-l. Bedroom Mantel. |
| 844-e. Dining Room Side-board. | 844-m. Dressing Room Mantel. |
| 844-f. Lower Hall. | 844-n. Dining Room. |
| 844-g. Lower Hall. | 844-o. Parlor. |

Size, 8 x 10. Price, unmounted, 40 cents each, \$4.00 per dozen

IN ORDERING, please state that the numbers are taken from our “Architectural Catalogue,” to avoid confusion with our general catalogue.

SOULE PHOTOGRAPH CO.,

338 Washington St., Boston.

The Instantaneous Water Heating Co.



210 Illinois St., Chicago.

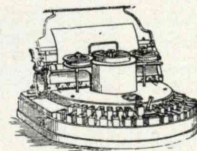
Manufacturers of the *Douglas*, and *Acme* Instantaneous Water Heaters for Baths, etc. Used with Gas or Gasoline. Architects please investigate.

FOR INFORMATION ABOUT U. S. MAIL CHUTES,

Which are a necessity in Office Buildings and Hotels, write to the sole makers,
THE CUTLER M'FG CO., ROCHESTER, N. Y.
PATENTED. AUTHORIZED.

La Hollande a Vol d'Oiseau.

A most beautiful book. Henry Havard's “La Hollande.” Illustrated by Maxime Lalanne. Send for circulars to Technology Architectural Review.



“The best typewriting machine that has come to our knowledge.”—Committee Franklin Institute.

Send for Catalogue.

The Hammond Typewriter Co.,

300 Washington St., Boston, Mass.



F. WEBER & CO.,
Engineers' and Draughtsmen's Supplies,

UNITED STATES AGENTS FOR

RIEFLER'S PATENT DRAWING INSTRUMENTS,
SUN AND ECLIPSE BLUE PRINT PAPERS,
JUPITER ROLL PAPER.

Artists' Materials of Every Description.

No. 1125 Chestnut Street, Philadelphia.

Branch House: No. 312 N. 6th Street, St. Louis, Mo.

THE · HYDRAULIC · PRESS
 ○ · BRICK · COMPANIES · ○
 MAKE · A · SPECIALTY · OF · HIGH · GRADE
 BRICK · PLAIN · MOVLDED · AND · ORNAMENTAL



ST ·
 LOUIS ·
 MO ·

KANSAS ·
 CITY ·
 MO ·



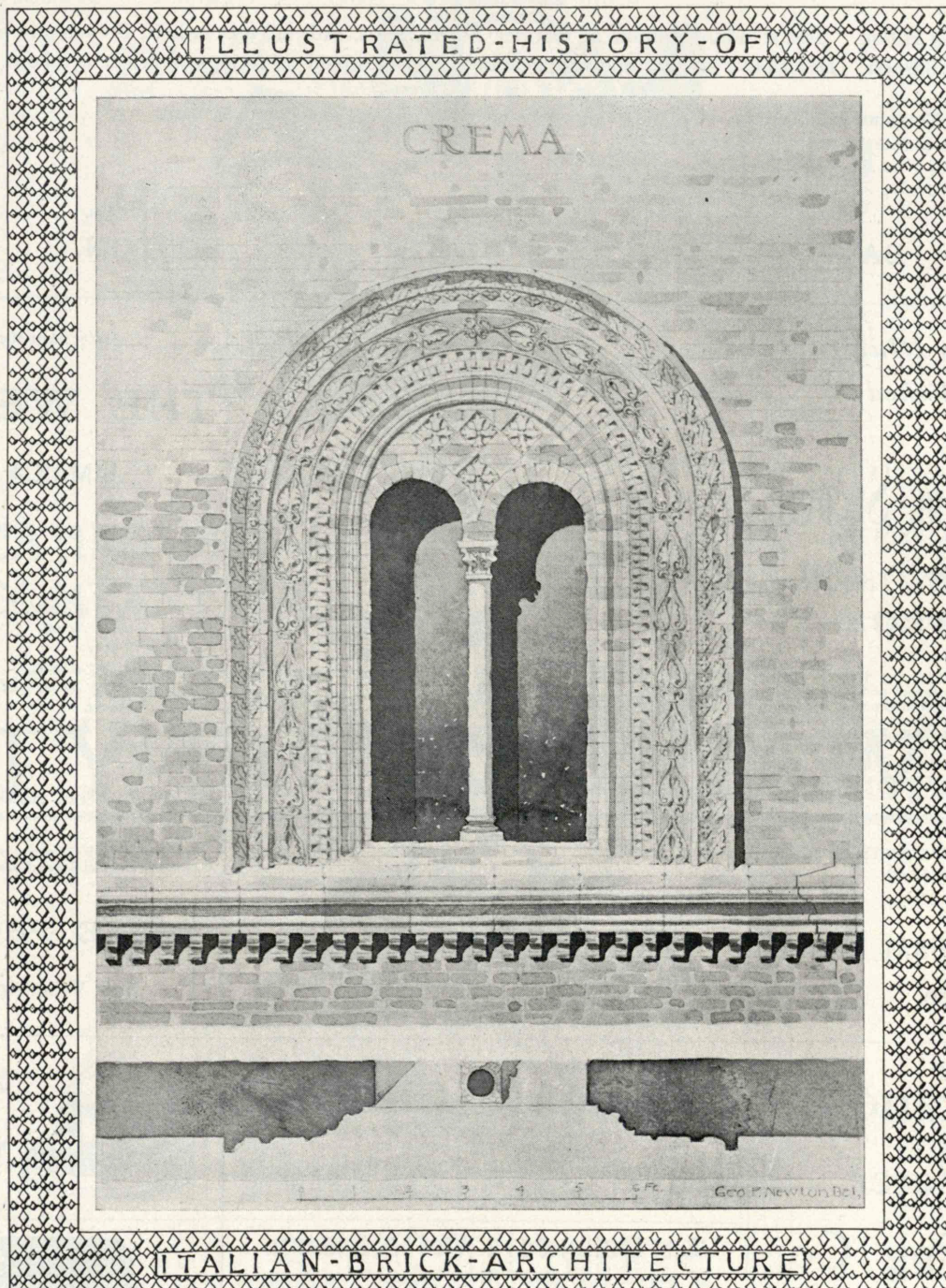
WASHINGTON ·
 D · C ·

CHICAGO ·
 ILL ·



PHIL ·
 A ·
 DELPHIA ·
 PA ·

FINDLAY ·
 O ·



ITALIAN · BRICK · ARCHITECTURE

CONTRIBUTED BY THE HYDRAULIC PRESS BRICK COMPANIES.

THE CATHEDRAL OF CREMA,

BUILT ABOUT THE END OF THE THIRTEENTH CENTURY, HAS A BEAUTIFUL ROMANESQUE FACADE, REMARKABLE FOR ITS CAREFUL AND ACCURATE WORKMANSHIP. THE WINDOW HERE ILLUSTRATED IS IN THE CENTRE OF THIS FACADE, ABOVE AN ELABORATE ROSE. THERE ARE TWO OTHER ARCHED WINDOWS ON EACH SIDE, ONE ABOVE ANOTHER, ALL OF DIFFERENT DESIGNS. DETAILS OF ONE OF THESE WILL BE GIVEN IN A FUTURE NUMBER OF THE REVIEW.

Geo. F. Newton, Des. et Del.



A sample of the most
PROFUSELY
ILLUSTRATED
 Architectural Journal published in the U.S. sent on receipt of a
TWO CENT STAMP.
 Important competitions open to subscribers for 1891. Cash and other prizes.
 Address,
Builder, Decorator, and Woodworker,
 1305 ARCH STREET, PHILADELPHIA, PA.

ESTABLISHED 1810. 82d YEAR.

N. & G. TAYLOR CO.,

PHILADELPHIA.

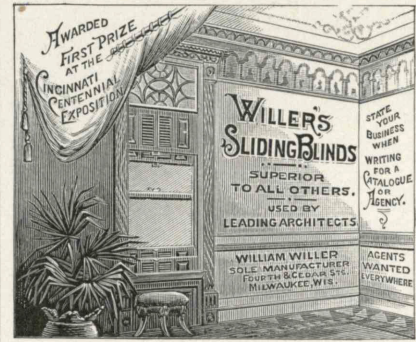
A GUARANTEE ON ROOFING TIN THAT PROTECTS.

We will give two perfect sheets—or the value of same in cash—for every sheet that can be found of the Genuine Taylor "OLD STYLE" brand of Roofing Tin in showing the slightest imperfection. If such a sheet has been used, we will, in addition to the above, bear the expense of having it removed from the roof and replaced with a perfect sheet.
 N. & G. TAYLOR CO.

N. & G. TAYLOR CO.,

The ONLY firm that has ever given a bona fide Guarantee on ROOFING TIN.

Willer's Sliding Blinds,



Milwaukee, Wisconsin.

Notman.

PHOTOGRAPHIC PORTRAITURE
 of every description.

MINIATURES ON IVORY.

Only Studio in Boston Opposite the Public Garden.

99 Boylston Street.

Cabinets, Tables, Linen Papers. Ribbons, and Supplies for all Machines. Machines on Trial.

Send for Catalogue.

The Hammond Typewriter Co.
 300 Washington St., Boston.

J. P. FALT & COMPANY,
 QUARRYMEN AND MINERS OF
RED SANDSTONE.
 Contractors for CUT STONE WORK.
 Quarries and Works, SPRINGFIELD, MASS.
 Prices for rough stone on application. Estimates made for cut-stone work to be delivered at any railroad point. Correspondence solicited. Send for sample.



DEVOTED TO
ART, ARCHITECTURE,
 Archaeology, Engineering and Decoration.
PUBLISHED EVERY SATURDAY.
 Subscription, \$6 per year. 15c. per copy.
 Foreign Subscription, \$7.50.
SAMPLE FREE.

PRESS NOTICES.
 One of the handsomest and best architectural papers among our exchanges is ARCHITECTURE AND BUILDING. Well illustrated, printed and edited, treating on all matters of interest to the building trade.—*Wood and Iron.*
 It is without doubt the most valuable publication of the kind published in the country.—*Southern Lumberman.*
 One of the best architectural periodicals of the day is ARCHITECTURE AND BUILDING.—*The Christian Union.*
 It is not often that so much and so valuable material is found at one time in a trade journal.—*The Publisher's Weekly.*

WM. T. COMSTOCK, Publisher,
 23 Warren Street, N. Y.



COLUMN DECORATED IN STUCCO, COURTYARD OF THE PALAZZO VECCHIO, FLORENCE.
 FROM DETAILS OF DECORATIVE SCULPTURE, ITALIAN RENAISSANCE. BATES, KIMBALL & GUILD, PUBLISHERS, BOSTON.

Should be named in Specifications. Samples Free.

SAMSON Solid Braided SASH CORD

The Most Durable and Economical.

SAMSON CORDAGE WORKS,
 115 Congress Street, Boston, Mass.

Candidates for admission to the
SPECIAL COURSE IN ARCHITECTURE,
 Mass. Institute of Technology,
 Are required to show proficiency in Free-Hand Drawing. Special attention is given to fitting students for this course by the

Cowles Art School,

New Studio Building, 145 Dartmouth Street, Boston.
EIGHTH YEAR.

Evening Classes in Drawing, from the life and cast, have been formed with special reference to the accommodation of architectural students, draughtsmen in architects' offices, and others engaged during the daytime.
 The training here given is patterned after that of the best Ateliers of Paris, and covers the ground necessary in preparing for the Ecole des Beaux-Arts.

Day and Evening Classes.
 Full Courses in Drawing and Painting.
 Special Attention to Life and Cast, Portraiture and Illustrating.
 Begin any time.

ERNEST L. MAJOR, MERCY A. BAILEY, }
 JOSEPH DECAMP, ANNIE E. RIDDELL, } Instructors.
 HENRY H. KITSON, MARIUS L. CHAUVÉAU, }

FRANK M. COWLES, Manager.

For circulars, address as above.

CLINTON WIRE LATH.

See advertisement on page vi.

U. S. MAIL CHUTES,

Which are a necessity in Office Buildings and Hotels, write to the sole makers,

THE CUTLER M'FG CO., ROCHESTER, N. Y.

PATENTED. AUTHORIZED.

ARCHITECTURAL CABINET WORK, ETC.

J. N. LOMBARD,
 58 Bowdoin Street, near Beacon, Boston, Mass.

The Architectural News

Published Monthly

609 SACRAMENTO ST.,
 SAN FRANCISCO, CAL.

Subscription, \$3.00

MACKITE

AN IMPROVEMENT ON THE PRESENT METHOD OF ROUGH PLASTERING. Manufactured in any length slabs from 1-2 to 6 inches thick. Plastering done in one-tenth the time of old way, winter or summer. No waiting for walls to dry out. No dirt, as in case of plasterer's mortar. Less weight, less conductivity of cold or heat. Can be used for deafening, back-plastering, non-conducting or isolating partitions, furring, floors, roofs, etc. **FIRE-PROOF, EASILY TRANSPORTABLE.**

EASTERN PLASTER BOARD CO., 52 Broad St., New York.

Massachusetts Institute of Technology.

BOSTON, MASS.

FRANCIS A. WALKER, PRESIDENT.

THE INSTITUTE OF TECHNOLOGY OFFERS FOUR YEARS' COURSES, LEADING TO THE DEGREE OF BACHELOR OF SCIENCE, IN CIVIL, MECHANICAL, MINING, ELECTRICAL, CHEMICAL, AND SANITARY ENGINEERING, ARCHITECTURE, CHEMISTRY, BIOLOGY, GEOLOGY, AND PHYSICS. A COURSE OF GENERAL STUDIES FOR YOUNG MEN CONTEMPLATING A BUSINESS LIFE IS ALSO PROVIDED.

THE COURSE IN ARCHITECTURE

aims not only to make the student thoroughly acquainted with the scientific principles underlying sound construction, and to familiarize him with the mathematical and mechanical formulæ and processes necessary to the solution of architectural problems, but also to cultivate his taste in color and form by constant practice in design and by the study of the history of architecture. Too great restriction to purely professional work is avoided by the introduction of the study of modern languages, history, political science, etc., the proportion of time devoted to these general subjects diminishing as the student goes on in his course.

The studies of the first year are common to all the courses of the School, and embrace mathematics, drawing, chemistry, and modern languages. In the higher years, thorough courses in analytic geometry and the calculus, carried on simultaneously with lectures and laboratory work in physics, lead up to the study of theoretical and applied mechanics, the lecture-room work in which is supplemented by actual laboratory tests to determine the strength of the various building materials, the accuracy of the commonly accepted constants, etc. The strictly professional work begins with instruction in materials, common constructions, and architectural history, followed, in the later years, by courses in stereotomy, iron construction, specifications, and contracts, in heating and ventilation, in planning, and in the requirements of schools, theatres, hospitals, and other special classes of buildings. Whenever practicable, the text-book and lecture-room work is emphasized by visits to actual structures; and throughout the whole course the student is continually drilled in original design. To this end two problems each month are required,—one, a sketch, to be finished within one week; and the other, more elaborate, occupying the whole month for the completion of the details and finished drawings relating to it.

Sketching in water-color and pen-and-ink, together with lectures and exercises in color decoration and history of ornament, are in charge of well-known gentlemen; and a class for drawing from the living model is maintained during the greater part of the year.

Unusual advantages exist in the nearness of the Boston Museum of Fine Arts and of the Boston Public Library, the facilities of which are freely offered by the Trustees to students of the Institute. The School itself possesses a valuable departmental library and collection of casts and building materials.

The professional work is under the immediate charge of Prof. Francis W. Chandler, who gives the lectures on Construction, Specifications and Contracts, Materials, and Special Classes of Buildings; Assoc. Prof. Eugene Létang, the Instructor in Third and Fourth Year Design; Asst. Prof. Eleazer B. Homer, Arch. Hist. Orders, Shades and Shadows, Stereotomy, and Second Year Design; and Walter H. Kilham. Special instruction is given by Messrs. Ross Turner, in Water-Colors; C. Howard Walker, in Decoration; Ernest L. Major, in Drawing from the Life; and David A. Gregg, in Pen-and-Ink Sketching.

For detailed information apply to

J. B. HENCK, JR., Secretary.

“GIANT” METAL SASH CHAIN.

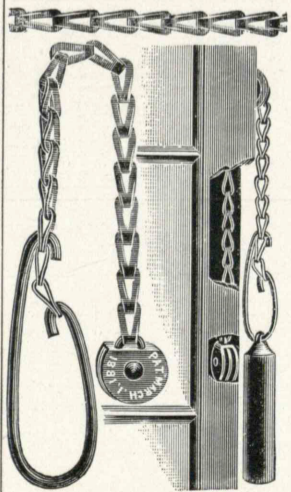
OVER TEN YEARS' UNPRECEDENTED SUCCESS.

“JEWETT” DOUBLE AND SINGLE ACTING SPRING BUTTS,

MADE IN IRON, AND ON SPECIAL ORDER IN REAL BRONZE.

MANUFACTURED ONLY BY

THE SMITH & EGGE MANUFACTURING COMPANY,
BRIDGEPORT, CONN.

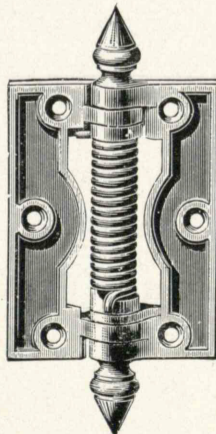


ECONOMICAL SUBSTITUTE FOR CORD AND CABLE CHAINS FOR HANGING HEAVY WEIGHTS TO WINDOWS.

This Company absolutely controls the only Automatic Machinery which feeds the metal into the machine, punches out the links, forms them into the chain, draws it out of the machine, and tests its tensile strength without any human hand touching it.

Also Red Metal and Steel Sash Chain made in the same way, for ordinary use, where a cheaper article is desired strong and simple. Also Patented Fixtures for attaching to the sash and weight and easily and rapidly applied.

Also Manufacturers of very SUPERIOR SINGLE and DOUBLE GROOVED Steel Axle, Iron, and Real Bronze Pulleys, and BALANCING FIXTURES for the DOUBLE GROOVED PULLEYS, an entirely new and practical device for hanging very heavy PLATE GLASS by two strands of chain on each side of sash.



In introducing this BUTT to the public, the manufacturers feel assured that they are offering an article of rare merit, that cannot fail to give satisfaction in use, and they respectfully call attention to the following points of excellence:—

1st. They are made from the best material we can select, and the Springs are formed of very superior steel spring wire made especially for this purpose, and are thoroughly reliable.

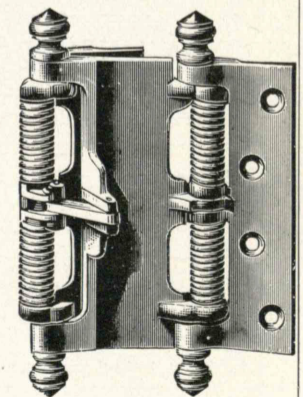
2d. All the Pins and Push Bars are made of steel and hardened, thus making them the most durable Butt in the market, as the greatest amount of wear comes on these parts.

3d. The Springs exert their greatest power when the doors are closed, and their force gradually decreases as the doors are opened.

4th. They are the most easily adjusted to the doors, neat and attractive in construction and finish, and not liable to get out of order, and adapted to severe wear.

Special attention paid to communications of Architects and Builders, and samples sent free of charge to any address.

Post-Office Box No. 26.



BRIDGEPORT, CONN., U.S.A.

TECHNOLOGY ARCHITECTURAL REVIEW.

DEPARTMENT OF ARCHITECTURE,
Massachusetts Institute of Technology.

VOL. III.

BOSTON, OCTOBER 31, 1890.

No. 6.

PUBLISHERS' DEPARTMENT.

HENRY D. BATES. THOMAS R. KIMBALL. IRVING T. GUILD.
EDITORS.

BOSTON MASS.

Eight numbers constitute a yearly volume.
Price, mailed flat to any address in the United States or Canada, \$3.00 per volume in advance. To any foreign address, \$3.50 per volume in advance.
Single copies, 50 cents.
Remittances by Postal or Express Money Order, or Bank Draft on *Boston or New York* should be made payable to BATES, KIMBALL & GUILD.
A limited number of files of VOLUME I., and of VOLUME II., in portfolios, \$5.00 each.

Copyright 1890, by BATES, KIMBALL & GUILD.

THE EDUCATION OF THE ARCHITECT.

I.

Since archæology has become a science, and precedents have been classified, organized, and rendered accessible, the progress of architecture as a fine art has been seriously interrupted. This accumulation of knowledge has divided into many channels those forces which, when confined to one, have developed style. It has tended to create a profession of virtuosos instead of artists, and to make the history of modern architecture a record of more or less ingenious experiments in style. But notwithstanding our efforts to imitate old things, new conditions of structure, material, and use have combined to give to modern work a distinctive character as modern. To this extent modern work seems to be fulfilling fairly its proper function to express modern civilization. But it is a reproach to us that as yet, with all this unavoidable differentiation, modern architecture has apparently not yet developed distinctive modern styles. What is the remedy? Evidently our only protection from this anarchy of art must reside in the cultivation of convictions, which are fruitful, as opposed to the license of eclecticism, which is sterile. It is, therefore, the most obvious duty of one who undertakes to advise architectural aspirants as to their education, to impress upon them the fact that convictions arise, not from inspiration, but from study and high training.

There have been perhaps a dozen prominent men in the profession during the last twenty years whose work has been distinguished for a persistent effort to develop style by the process of consistency,—by adopting, as a basis of design, some historical phase of architecture, like the Romanesque, which as yet has not been developed to its last expression, and by remaining faithful to it through every temptation to try their hands at other styles. The result has been that they have exhibited progress in their works, and have been followed therefore by others to a sufficient

extent to create, within certain geographical areas in our country, a distinctive architectural expression, not important enough in quantity perhaps to attract attention as a national type, but sufficient to show that consistent and concentrated efforts in this direction will almost inevitably afford such a type sooner or later. But the great majority of our educated architects are still contenting themselves with doing merely correct, elegant, and scholarly work, which seems to give no direct impulse to style, has no indication of healthy, vigorous life, and, so far as we can see, but little capacity for progress.

The ranks of the profession are daily recruited from the body of young draughtsmen who think that they recognize in themselves certain capacities for composition, while in reality they are without a solid basis of practice or knowledge, without serious convictions of duty, and without the ability to advance. Most of these young men mistake a power to appreciate, enjoy, and produce picturesque and romantic effects, for a complete architectural equipment. This power is easily acquired; to some it comes with scarcely an effort. It is the first indication of the possession of an architectural mind, but it is only the first, and the young architect begins practice with a capital composed only of conceits, fancies, shallow predilections, and clever "dodges," all in a narrow range, and is completely at the mercy of his own caprices. He can copy, he can invent, but he is not in condition to progress. It is to this fact, more than to any other, that is to be attributed our national failure to create style.

I am sure I am not mistaken, therefore, when I say that, in respect to the theory of design, the young architect is not ready to do justice to himself, to his profession, or to his clients, until his mind has been thoroughly saturated with the feeling for delicacy, purity, and finish, for exactness of proportion and precision of detail, which can only be obtained by studying, drawing, and combining the classic orders, by understanding under what conditions they were developed in Greece and the Greek colonies, how they were treated and organized by the Romans, what modifications they underwent in the hands of the Italian and French masters of the Renaissance, and the slow processes by which, in France especially, they gradually transformed and finally supplanted the mediæval forms.

These exercises in the orders, in their history and their applications, constitute a refining process, and furnish the student with an architectural conscience, as it were. Their effect upon his mind is such that he is enabled to design seriously, so that his work, whether classic or romantic, renaissance or mediæval, becomes so highly organized as to be sensitive to the slightest change, and cannot submit to modifications without loss of artistic unity. Indeed, in general, the test of good design resides in this quality of sensitiveness. An architectural composition, like a drawing of a human figure, should be so conscientiously studied that the change of a foot in general dimensions, or of an inch or fraction of an inch in details, will be felt throughout the whole mass. This is the way to make a work of art. It should be a

highly developed and consistent organism. An exclusive training in romantic work hardly furnishes standards and formulas sufficiently sensitive to create an architectural conscience so justly fastidious and self-denying. The essential spirit of romanticism, as opposed to classicism, is self-indulgent; it does not encourage simplicity or reserved force; it occupies the mind with predilections and prejudices, instead of principles and convictions; it makes pleasure rather than duty a leading motive. I do not mean to say that a mediævalist cannot have an architectural conscience, or that he cannot be capable of a high degree of reserve and refinement in his work. But the cathedral builders were masters of design, because, by the limitation of their knowledge, they were kept in a narrow channel, and, like a stream, were swept onward all the faster for this reason. We are tempted by our greater knowledge to frequent diversions and excursions outside of a course of reasonable progress, and it needs a spirit of very exceptional natural qualities to resist such temptation; we thus become shallow and slow by a dissipation of forces. It is not for the exceptional genius, but for the commonplace student that I write, and it is on him that I urge the pre-eminent importance of preliminary training in classic forms.

Another serious obstacle in the path of consistent progress is in the too frequent want of preparation in construction, in the knowledge of strength of materials, and in at least the outlines of chemistry, electricity, mechanics, and the other sciences necessary to a full architectural equipment. The absence of thorough education in these practical departments has done very much to throw discredit upon the dignity and usefulness of the profession. It is not sufficient or wise for a man to gain this indispensable practical knowledge, in the course of his practice, at the expense of his clients and of his own reputation or peace of mind. In the designing of a building, scientific questions of economic structure occupy a far larger part of the architect's thoughts than questions of pure art. Indeed, the latest and most advanced developments of architectural form have been absolutely controlled by considerations of economy and stability, and the devices of construction with steel and fire-proof envelopes, to satisfy these considerations, have become so exacting, in respect to the essential form and details of the structure, as to demand the utmost amount of ingenuity to present them as architecture. The architectural character of the most important civic buildings of modern times rests entirely upon practical considerations, which not infrequently remove them from the direct influence of precedent into difficult, perilous regions, where the architect is compelled to exercise the very highest qualities of art, and where the works of the great historical masters and the monuments of the great national styles seem to give him little or no aid. The frequency of problems of this sort increases with the advance of civilization; and he who is not prepared to solve them with the ample resources, not only of a scientific constructor, but of an artist trained to express the most exceptional conditions of structure in adequate architecture, can never reach the highest and most remunerative professional practice.

It will not be long before those who propose to enter the ranks of the profession will be compelled by legislation, in view of public safety, to submit their knowledge as practical and scientific builders to a rigid examination before they are admitted to practice. In various parts of the country strong efforts are making to secure such legislation; and when adequate laws shall have been passed in one State, they will very soon be enacted in others. It is the obvious interest of the profession to forward such movements, and memorials to this end have already been prepared and presented by chapters of the American Institute of Architects.

In fact, the field of modern practice is demanding a much higher equipment in respect to art, and a much more

thorough knowledge in respect to construction, than heretofore.

I am not informed with respect to the details of the curriculum in the architectural schools established in Cornell and in various colleges, especially in the West, but that connected with the School of Mines at Columbia College, under the charge of Prof. W. R. Ware, and that of the Massachusetts Institute of Technology, under the charge of Prof. F. W. Chandler, are universally acknowledged to be abundantly equipped with every facility for architectural instruction. They are wisely administered, generously endowed, and have been long enough in existence to have emancipated themselves from those traditions of the European schools, which have no immediate appreciation of our needs, to have adjusted themselves to our conditions, and to have created an atmosphere for the American student full of wholesome inspiration. Their courses cover instruction in the history of architecture, in the theory and practice of design, based mainly upon classical methods, free-hand and instrumental drawing, water colors, construction in all its branches, including strength of materials, specifications, and all those branches of science which affect architecture. A conscientious use of the manifold advantages offered by such schools through a full course of three or four years, as the case may be, followed by a few months of intelligent observation and study abroad, and by two or three years of experience at home as a draughtsman in a well-ordered office of established reputation and practice, constitutes almost an ideal course of preparation for the architect. It depends upon personal considerations whether the office experience should precede or follow the theoretical studies of the school; my own opinion is in favor of the order I have named, and I am quite confident that six months' travel abroad after the course of theoretical training, whether the office experience follows or precedes such travel, will have far more value to the student than three years of travel before such training. The man who by previous education knows what to expect from foreign observation, and what he needs to complement, confirm, or correct his knowledge, to refine his architectural mind, and to enlarge and purify his resources of design, observes with an intelligent and critical mind. His strength is not wasted by studying accidental effects, curiosities of design, and other non-essentials, and he does not overlook points of composition or construction because they may be presented in a manner less fitted to attract the attention of the uneducated. He knows enough to recognize vital and fruitful qualities in historic architecture, even when concealed under an archaic mask. He can detect such qualities as a useful basis of design; and while he studies and sketches those developments of style which present the last phases of dying forces, and are therefore incapable of further progression, he will not allow himself to be limited by them, and he will not allow details, however beautiful, to interfere with the cultivation of high ideals. The untrained mind can gain no such advantages by foreign travel, without a great loss of time. To fill a sketchbook with miscellaneous odds and ends, however cleverly rendered, will be of little or no advantage to the student, except as exercises in the training of the hand and eye, if they are not made subordinate to the obtaining of convictions or principles of design and practice. If he does not return home with such confirmed convictions, it would have been better for him to have filled his sketchbooks with copies from architectural books and photographs, studied and selected at home, thus saving the expenses of futile travels.

The young men, whose circumstances are such as to enable them to avail themselves of a course of instruction so copious as that which I have outlined, are also apt to be blessed with influential relatives, "with cousins, with uncles, and with aunts," and family friends, whose very existence, it has been humorously

claimed, as furnishing to the young architect a fruitful and indulgent clientele in the very beginning of his professional career, is as useful as four years of preparatory study in a school. But the history of architecture proves that the most successful and illustrious men in the profession have followed no such royal road to good fortune, and the poor lads, who not only are unable to show the world, in their own persons,

“How much the fool who has been sent to roam
Excels the fool who has been kept at home,”

but who cannot avail themselves even of the manifold advantages of the professional schools, need not be discouraged.

Every city in the country has a group of draughtsmen whose education depends solely upon such experience as they can gather by employment in local architectural offices. It is needless to say that such experience, unaided by well-directed study outside, can procure for them only an ill-directed, inadequate, and one-sided instruction. Yet, in a very large proportion of cases, the capacity to practise rests upon this unsubstantial basis, aided by such natural aptness as they may have been endowed withal. This may be a sufficient education for a plumber, a mason, or a carpenter, but for an architect it is impossible that it should be other than fruitful in disaster to architecture and in disappointment to the practitioner. From this source come the array of illogical, undisciplined, ungrammatical, vernacular work, the imitations of imitations, and the endless succession of capricious inventions, which line our streets, and give to the architectural expression of our times an element of vulgarity which does not fairly express the degree of cultivation which we have really reached as shown in all the other arts. The occasional erection of a good building by an educated architect establishes a home mission wherever it appears, and exercises an immediate, well-marked, beneficial influence over such local practice. But this influence stops with illiterate copies of some of the external characteristics of the new structure. It hardly penetrates below the surface, or furnishes to the uneducated members of the profession principles upon which they can design with intelligence and dignity.

Now, in the absence of the methods of training furnished by schools and travel, what remains available to the poor fellows who wander from office to office, earning a subsistence more or less precarious, and meanwhile eager to learn in the midst of influences more likely to degrade than to elevate the imperfect ideals which they may have been able to form? Aspirants of this sort should be cheered by the reflection that their condition, if properly made known to any educated architect, will demand and obtain his active sympathy and best advice. This sympathy and advice will, I believe, generally take some such form as this:—

It must be assumed, in the beginning, that in nearly every large community there are available to the student, either in public or private libraries, or in the hands of his employers, standard works on architecture and construction. A little economy will enable him to purchase the most desirable of them. I found it useful in my own experience to make copious notes and sketches from those volumes which I could not afford to purchase. I doubt not that this process made them more my own than if their home was on my own shelves. Of these books those relating to the history of architecture should be first read. Fergusson's general histories, and such special treatises as Street's "Brick and Marble in Italy," his "Gothic Architecture in Spain," Scott's "Secular and Domestic Architecture in England," and the invaluable, general articles on Cathedrals, and on Monastic and Domestic Architecture contained in the monumental Dictionary of Viollet-le-Duc. Moore's "Development and Character of Gothic Architecture" may also be studied to great advantage as presenting an admirable

analysis of true architectural progression. But perhaps the most useful of general histories after Fergusson are Reber's "Histories of Ancient and Mediæval Art," which contain by far the best, most concise, most entertaining, and most unprejudiced compendium of information on the wide range which they cover.

Of books on the theory of architecture I know of none so inspiring and so elevating as the first volume of the "Discourses" of Viollet-le-Duc. I earnestly recommend it to the student. In order to make these books stay with him, he should make copious notes and sketches from them as he reads. A diligent course of such reading through the available nights of a single year would go far to furnish him with high standards, to make him impatient of any form of vulgar pretence, and to inculcate respect for the works of the masters in our art.

Coincident with this course of history and theory, or following it, there should be a thorough and exhaustive study of the classic orders. I found Gwilt's edition of the "Civil Architecture of Sir William Chambers" a very convenient introduction to this study. Any good edition of Vitruvius, however, or the works of Vignola or of any of the Italian masters, would perform the same service. Some one or two of their works are available in every public or professional library. These orders should be carefully drawn and committed to memory with precision, that is, without fanciful variations. The test to which the student should subject his knowledge of the classic proportions is in free-hand memory sketches of the correct orders and of their combinations at large and small scales without measuring. This exercise will begin to bear fruit when these sketches shall have been found to retain the traditional proportions and details, and when the respective characteristics of the orders, according to the Romans, shall have been fully mastered. The attainment of absolute knowledge with regard to these venerable formulas will at once place the student far in advance of those of his fellows who remain ignorant of the classics, and content themselves with such specious nourishment as they can obtain from dalliance with the picturesque and the romantic. He will have been taught to regard architecture seriously and sincerely, while they still look upon it as a sort of amusement, which gives opportunity for the display of a shallow facility, easily acquired, and affording no discipline to the habit of the mind in designing. He will have learned to distrust draughtsmen's tricks in drawing, to set down no line which has not a meaning, to avoid making his studies picturesque at the expense of truth, remembering that the available methods and materials of structure now in use cannot create the affected waving lines and billowy surfaces which are characteristic of so many of the published drawings of the day.

HENRY VAN BRUNT.

[To be continued.]

Dennis Miller Bunker, whose drawing of Michel Angelo's "Night" is published in this number (Plate XXIX.), was born in New York, Nov. 6, 1861, and worked in the New York schools, principally in the life classes of the Art Students' League, until 1881, when he went to Paris, where he became a student of the Academie Julien, and afterwards studied under Hebert and Gerome, returning in 1884. He received the third Hallgarten prize at the Academy in 1885, and was in that year elected a member of the Society of American Artists. In 1886,

he became instructor in the Cowles Art School, Boston, but returned to New York in the winter of 1889-90, and died in Boston, Dec. 28, 1890.

His work is that of a thoroughly artistic temperament, cultivated by thoughtful study. His drawing, accurate as it would necessarily be from the influence of Gerome, is never dry or hard, but full of vigor, and with great ease of manner and simplicity. His portraits especially have great refinement and character, and a certain quality of distinction which is far from usual. He succeeded in imparting a certain hauteur to his sitters, which made them somewhat more distinguished than was perhaps their wont. This was merely the reflex of his own personality, for he himself could be better described as debonair than by any other term. His charm, his grace and bearing, the very flavor of his speech, belonged more to the courtier of the Grand Monarque than to the democrat of to-day, yet no one was more in earnest than he, or had greater possibilities before him. His loss is the greater that it cannot be realized, but only conjectured.

DEPARTMENT OF ARCHITECTURE.

MONTHLY COMPETITION.

PLATE XXVII.

PROGRAMME:—*DESIGN FOR A PARK ENTRANCE.*

The main feature of the design to be a triumphal arch, connected by arcades or colonnades with small buildings containing the park offices on either side of a square in front of the arch. The square itself to be approached by a monumental bridge crossing a stream.

C. HOWARD WALKER.

JUDGMENT.

First Mention J. MCA. VANCE.

NOTES OF CRITICISM.

Given a problem such as has been presented to the student, and the necessity for a careful classic treatment thereof, and the design published is in every way worthy of its first mention. The details are clean and well chosen; the sculptures, excepting perhaps the two groups over the side portals, are thoroughly in scale and appropriate in sentiment, and the general effect would be such as our public parks unfortunately seldom present. It is really what it lays out to be, a magnificent entrance to a large park. If any exception were to be taken, the details might be said to be a little too delicate for so bold and decided a problem. The large, emphatic treatment of details which was followed on the Arch of Triumph of the Star in Paris would better suit so pronounced a central feature as this, rather than the delicate cornice about the centre or the Ionic work at the sides. Again, it is probable that the effect of the entrance would be considerably increased if less importance were given to the offices on each side of the approach. A perspective study of this design would show at a glance that by extending the wings so far on either side towards the front, the arch, which is the real focus of the design, is thrust into the background and necessarily subordinated. Exactly the same design with the side arcades carried around on a curve, and the offices reduced in projection

about one half, would be more monumental and imposing in effect, while losing nothing of its possibilities either for quiet refinement or bold vigor of detail. Still the design as a whole is so successful, and has been carried out so carefully in the drawings, that little serious criticism can be offered against it.

C. H. BLACKALL, *Critic.*

PLATE XXVIII.

PROGRAMME:—*A CAMPANILE.*

To be in two separate portions. The plan of lower portion to be square, and of upper portion to be octagonal. Arches to be used in upper portion only. Materials,—brick and stone. Details may not necessarily be classic. Required,—rendered drawings in color. One elevation,—one plan to a scale of one eighth of an inch to the foot, and one perspective sketch.

C. HOWARD WALKER.

JUDGMENT.

First Mention F. N. REED.
Second Mention V. A. WRIGHT.
Third Mention E. V. SEELER.

NOTES OF CRITICISM.

A campanile is, of itself, about as difficult a problem in design as the architect ever encounters, and if we may judge by the quantities of towers even in classic Italy which fall short of being thoroughly satisfactory, the difficulty of design is increased by the absence of recognized precedent. A comparison of the three designs under consideration would, perhaps, more clearly emphasize the strong points and the defects of each, than any abstract criticism of each taken singly. Each design shows a well-defined base, but in that which received the first mention this portion is very slightly treated, so as to really count for very little. The base in the design which was awarded third mention is considerably better, but is marred by the two insignificant and apparently useless windows each side of the doorway. The main shaft of the tower is proportioned about the same in each design. The arrangement of the windows in the design placed second is very happy, the openings being small and well in scale, while the balcony in front of the third tier prevents any monotony. The openings in the first design are too large and too much at random in their arrangement, and the same might be said of the third. The authors of the first and third designs have very wisely omitted, or but very slightly indicated, any quoined construction at the angles, while the second design treats the quoins very emphatically. The real effect in construction, of course, would depend entirely upon the materials, but in a general way it is probable that quoins which were marked in appearance would hurt rather than help the general effect. A tower is by no means a monolith, but the less the attention is diverted to the construction of the main shaft, the more the mind can appreciate the effect of the whole. In regard to its proportions, the first design is decidedly pleasing, though we should have liked to see the upper lantern a little less drawn out and the loggia a trifle higher. In the second design the balconies on each face, with the excessive brackets, form a picturesque feature, and, in a way, serve to mark the top of the square portion without resorting to the familiar loggia device, but it is a question if anything is gained thereby. The dome which caps the lantern of the third design is so different in spirit and detail from the loggia, that it does not quite seem in place. Except for the requirements of the problem, the tower would look on the whole rather better without any lantern at all.

A problem which is so simple in its requirements naturally calls for study of proportion more than detail, and in this the three designs have been quite successful. Indeed, on the whole, all of the designs submitted by the class were considerably above what was expected.

C. H. BLACKALL, *Critic.*

A STUDY OF DECORATION.

(Continued from Vol. III., No. 5.)

RENAISSANCE.

The history of the Renaissance is of so complex a nature, and has so many different convergent forces incident to its growth, that it is wellnigh impossible to give even a synopsis of it in a few words. The Crusades of the tenth century produced much reflex influence of the East upon the West; interchange of ideas as well as of commerce was constant, and, while on the one hand Norman Counts were grafting a Northern style upon Eastern motives in Sicily, on the other the rich foliage of Oriental design began to influence Italian architecture. This would account to some extent for the multicolored style which appeared in Italy in the fourteenth century, the sometimes so-called tre-cento style, of which the Baptistery at Florence and the façades of the Badia at Fiesole and of San Miniato are examples. It consisted of the use of black and of white marbles in panels and in diaper patterns, with mouldings and character refined and delicate, and a use, also, of interlaces that were apparently derived from the East. This style was coincident in Italy with the culmination of the purest French Gothic in the Isle de France, and shows that Gothic was not the choice of the Italian, but was unsympathetic to a nation accustomed to the remains of ancient art. A little later on, with this work are found representations of realistic flower and fruit forms, handled not in the manner of the Gothic foliage, but more nearly resembling the garlands of the Romans. Such are the trims to the bronze doors of the Baptistery at Florence.

The great stimulus, however, to the art of the Renaissance, which, as its name implies, is a new birth of the ancient art, was given by the desire for culture that came with the security of the courts of the nobles in the Italian cities. The cities of Italy had become subject to a great extent to nobles, who were either free captains or adventurers, vicars of the popes, or leaders of the people, and in most cases the local sovereignty of these nobles had become hereditary, while at times as in Florence, where the people themselves held sway, the freedom was more apparent than real. The constant warfare, which had formerly exiled all art and culture to the cloister, became less, and all over Italy petty courts arose with a noble patron and numerous courtiers, among whom were poets, philosophers, wits, and artists. The study of classic literature by the poets of the fourteenth century was one of the most potent factors in inciting a taste for the classic ideal. The intellectual quality, the finish and skill shown in classic verse were alike apparent in classic art. To the awakening appreciation of the best of the Italians, all work of the immediately preceding centuries seemed crude and barbaric; the asceticism of the monastic teaching was repugnant; joyousness, and not asceticism, appealed to them, and they turned with eager and searching eyes towards what antiquity had left them of the golden age of their ancestors. With all it was the same; they were pursued by a burning enthusiasm to emulate the past. Giotto counted time by Olympiads, while yet unable to draw other than Gothic forms; Dante, Boccaccio, Tasso, each recognized the great poets of the Greeks and Romans as their models; the Pisani struggled to produce classic sculpture; Mantegna introduced colonnades and temples in his backgrounds; the strong fortress style of the Florentine palaces which, with Arnolfo del

Cambio and Orcagna, had pointed arches and Gothic mouldings, when touched by Brunelleschi and Michelozzo, became round arched with dentilled and modillioned cornices, and the cloisters of Santa Croce, with party-colored voussoirs and Gothic capitals, were supplemented by delicate classic arcades. Brunelleschi's complete surrender to classic proportions seems to have been induced by his pilgrimage to Rome and the months he spent there measuring and drawing the fora and the temples. His appreciation of proportion and of the intellectual quality of classic work seems to have been complete, but he did not for a moment attempt mere copying, but developed his own work in the classic spirit. At first there is but little attempt to do more than refine already existing forms. The grooved, deep-cut mouldings of the Gothic give place to fine flat mouldings about openings. Cornices are enriched, and belt courses receive eggs and darts and dentils. Little by little the wall surfaces, which at first are crudely cut, are more carefully finished, and finally the first pilaster treatment appears, as in Alberti's Palazzo Rucellai, and Bramante's Palazzo Cancellaria. It is but a step from this to the use of engaged colonnades and arcades as ornamental motives, and the subsequent grouping of columns, and of columns and pilasters. Constructive motives once used as ornament, their continued use and final degradation followed as a matter of course. In this lies the besetting sin of Renaissance work. With but few exceptions, ornamentation in all previous styles performed the service of accenting and beautifying constructive forms. It was reserved for the Renaissance artist, in his enthusiasm for classic work, to incorporate those forms without purpose other than ornamentation. The practice is unjustifiable, inasmuch as the result is inadequate. If one human being should adorn himself with fragments of another, the case would be somewhat analogous. The effect might possibly be decorative, but would be deemed barbaric, and could better be obtained by other means. So long as Renaissance detail was subservient to and enhanced constructive form, it was beautiful in proportion to its refinement; when it became ornament *per se*, the decay of the style had set in.

The Renaissance pilasters, which were similar to the classic antæ, had, in the earlier examples, plain surfaces, unfluted and undecorated; but, as the style was developed and enriched, these perpendicular members, in common with the horizontal members of the architectural scheme, were ornamented with sculpture. In classic work the sculptural enrichment was confined to the bases, capitals, and entablature, being especially developed in the frieze, and, as previously stated, the forms that were colored in the archaic structures were imitated in carving in the Ionic and Corinthian orders; in like manner the delicate painted scrolls of the long upright panels dividing the wall surfaces in the House of Titus, or at Pompeii, were reproduced in the round upon the Renaissance pilaster. In fact, the pilaster became an upright sculptured panel. In the Loggia of the Vatican, Raphael painted the pilasters as of old, being inspired by the discoveries made in his time upon the Palatine; but his work was infinitely more elaborated than that of the Romans, and betrayed the hand of a master, while theirs was done by craftsmen. The motives on the pilasters were of two kinds,—the continuous scroll, starting from a strong base leaf and rising in equal volutes, with alternating direction to right and to left, and filling the panel. This motive needed always to be balanced by its opposite, and was consequently seldom used. It had its prototype in the magnificent scroll from the Forum of Trajan. The other motive was that usually used, and capable of infinite variety, that of a central axis, the ornament diverging from it symmetrically on either side. This motive was borrowed from colored decoration on the Roman walls. It is a most difficult class of ornament to handle, as so

much depends upon relative distribution, proportion, and relief of modelling. The motive usually starts at the bottom and grows continuously to the top, with the base, whether a mass of leafage, a vase, or other unit of ornament, well defined, and the crowning unit strong and rich. The central axis can be actual or merely evidenced by the symmetry of the sides, preferably actual. To prevent an effect of absolute perpendicular division or of stringiness, this axis, between its base and its crown, is divided, either by knots of ornament, concentrated masses, or horizontal motives. In making these divisions, the rules of cadence need to be carefully observed; the divisions should be made equal in length, or alternate, or in sequence, and the same method should be observed in the units of ornament marking the divisions. In most cases there is more ground than ornament, which always demands that the lines of the ornament should be most carefully studied, and that the units used as terminals for these lines should be exactly disposed, in relation to the axis, to each other, and to the border of the panel. When one considers the number of factors which can enter into the composition of one of these panels, it can be readily conceived that their variety is wellnigh infinite; absolute symmetry on either side of a central axis on which are threaded units of ornament, and which starts from a mass of detail and terminates in a mass of detail; systems of radial lines diverging from the central axis and terminating in centres of ornament of greater or less size, arranged in all sorts of groupings; garlands, pendants and ribbons, vases, trophies, shields, birds, beasts and nondescript combinations, foliage conventional and natural, forms human and superhuman, all in varying scales, all in surfaces undulating, now rising into sharp relief with clear-cut edges, now sinking and melting into the background; and the whole so carefully balanced, so exactly distributed, that no portion should be too strong for another, no detail but should be equally refined. It is not an easy matter to succeed in a design of such requirements.

It is well into the latter part of the fifteenth century before this pilaster treatment is prevalent. The Quattrocento work contains much less of it than the Cinquecento. The motives used in the friezes are, with but few exceptions, the classic motives, somewhat more attenuated and refined. The garlands and trophies, lions' and bulls' heads, dolphins and griffins, tridents and shells and rosettes, and numberless familiar forms appear in a new guise; the new forms being, for the most part, heraldic motives or town arms, such as the fleur-de-lis of Florence, the Biscione or viper of Milan, and lions which are rampant, a condition unknown to their classic prototypes. Shields, though used before, have a new form, and ribbons are developed into all sorts of knots and waving ends, the loops having the same cadences in relative size as other decorative compound motives. The capitals are based upon the Roman capitals, but in most cases are marked improvements upon them,—simpler and with greater delicacy. The Doric capital is comparatively little used. The Ionic is of the Roman flat-faced variety, with but little to recommend it; but the Corinthian is refined and simplified, with one row of leaves, and finally only corner leaves supporting the scrolls, the scrolls themselves long and fine in line. There is a variety found at its best and most frequently in Bologna, in which the scrolls are brought to the astragal, and then are reversed into small volutes which, meeting, form a base for a central radial unit, palmette, flowers, or leaves. This is the variety adapted by the French in the time of Francis I. This central unit is of all kinds, simple and complex, conventional or natural.

The mouldings are essentially the classic mouldings, multiplied, adapted, and supplemented by factors derived from Gothic sources. Seldom, especially in the earlier Renaissance, are there as rich entablatures as that of the Temple of Jupiter Stator, and

the scrolled treatment of the Roman friezes is not apparently admired by the Renaissance designers. All the minor surfaces, beads, fascias, etc., are decorated more than in the Roman work. It is in the use of the panel, however, and in the translation of classic color decoration into relief decoration, that the chief differences exist between the old and the new work. Still another new development is that of the balustrades. The Roman parapet was either solid or of a pierced slab, of which the design can perhaps best be described by defining it as the result of combining upright and diagonal crosses with equal arms.

In Romanesque and in Byzantine architecture the relative scale of columns to each other was constantly ignored, especially as columns became less and less detached from the walls or piers, and finally were little more than crowned roll mouldings at the corners, so that it is usual to find not only all variations of proportions of diameters to heights of shaft, but also all sorts of columns in juxtaposition. It did not seem out of scale, therefore, to make a miniature colonnade do duty as a balustrade in the midst of columns of much greater magnitude. In Venice, in Lombardy, or in Spain such colonnaded balustrades are frequent. In classic work, on the contrary, this variation of scale of similar things was felt to be an error; at the same time, the colonnade was considered an excellent balustrade motive. The difficulty to be overcome was the forcing the colonnade into scale. This was done by making the little columns bulbous, so that they no longer resembled structural forms. In what this motive originated it is difficult to determine; its object is unmistakable. The balusters are of many forms, single with bases and caps of all the orders, double with a central belt or zone from which the baluster grows symmetrically both upward and downward. Clothed with acanthus leaves as on the stairs to the pulpit at Siena, fluted and ribbed, or circled with rich masses of horizontal mouldings. Many of them seem to have borrowed the forms of amphoræ and vases, and it is possible that the pottery forms may have suggested the baluster lines; all are alike in that they are purposely different from all other decorative motives, and form a separate class alone by themselves. Later carved and perforated screens take the place of the balusters, as in Santa Maria dei Miracoli, at Venice, having their prototypes in both Roman and in Byzantine pierced screen work.

It is natural that some of the Gothic motives should be used, but transformed by Renaissance details; and though such translation of one style into the other is more frequent in France and Spain than it is in Italy, there are to be found in the latter country Renaissance pinnacles, traceries, and flying buttresses, and diaper patterns which are evidently suggested by Gothic prototypes. Crockets alone seem to have been considered impossible factors in Renaissance work. The finials usually resemble vase forms, occasionally are frankly capitals, and in such cases support statues. Obelisks are also used, as in the Library at Venice. The traceries are in most cases superposed colonnades or arcades, and in the rosaces which occasionally occur in Renaissance work, colonnades are whirled about a centre, the columns following the radial lines. The rich shadow obtained by the succession of receding arches in Romanesque work is also borrowed and adapted, the only difference being in the detail, which is always classic.

The use of many colored marbles, of columns of all varieties of material of rich incrustation, which was so universal in Oriental, Byzantine, and Romanesque work, and which was imitated by the Romans during the reign of Hadrian, and from that time on, was entirely discarded in the earlier Renaissance work, and only appears later amid a general dissolution of forms, proportions, and color.

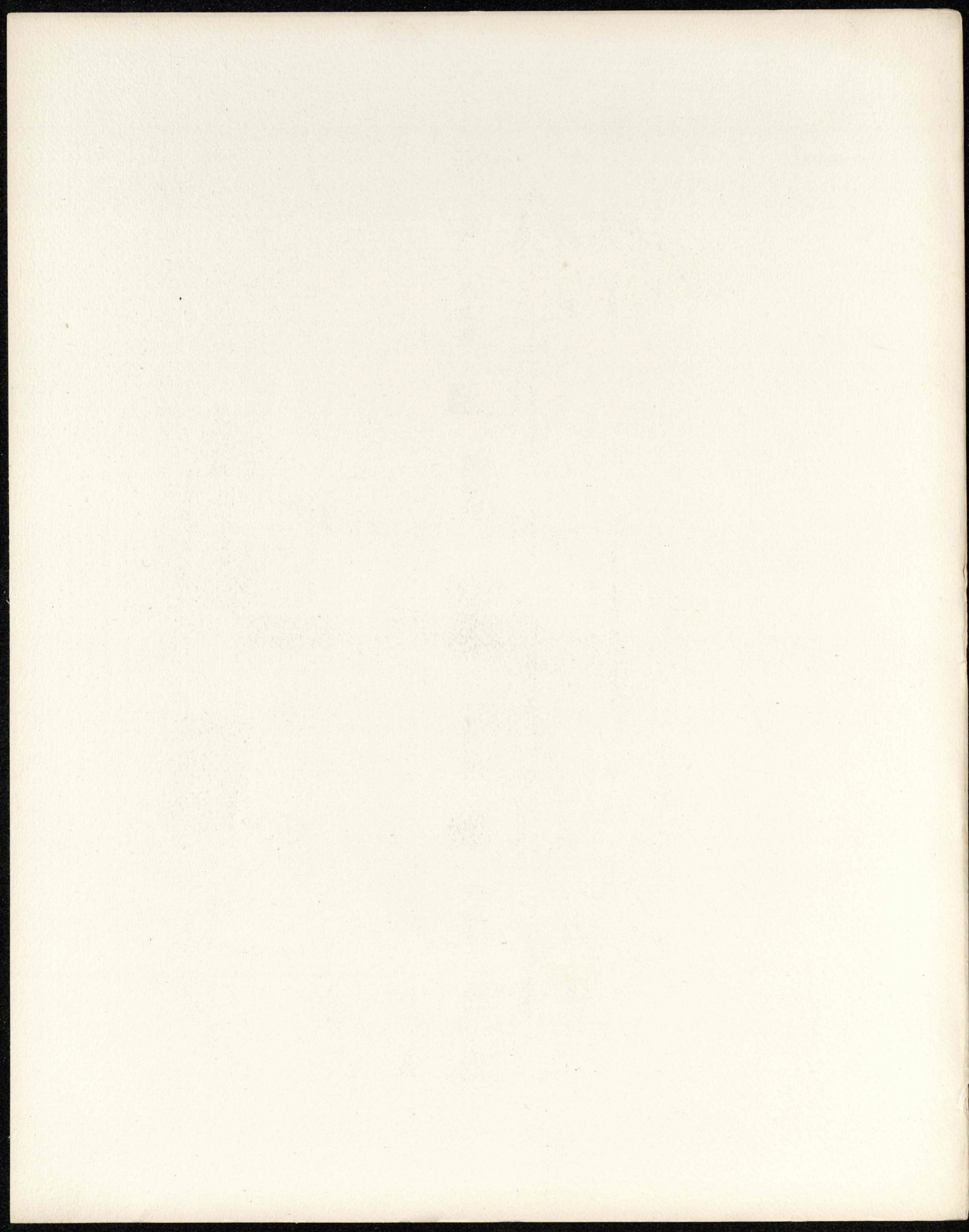
[To be continued.]

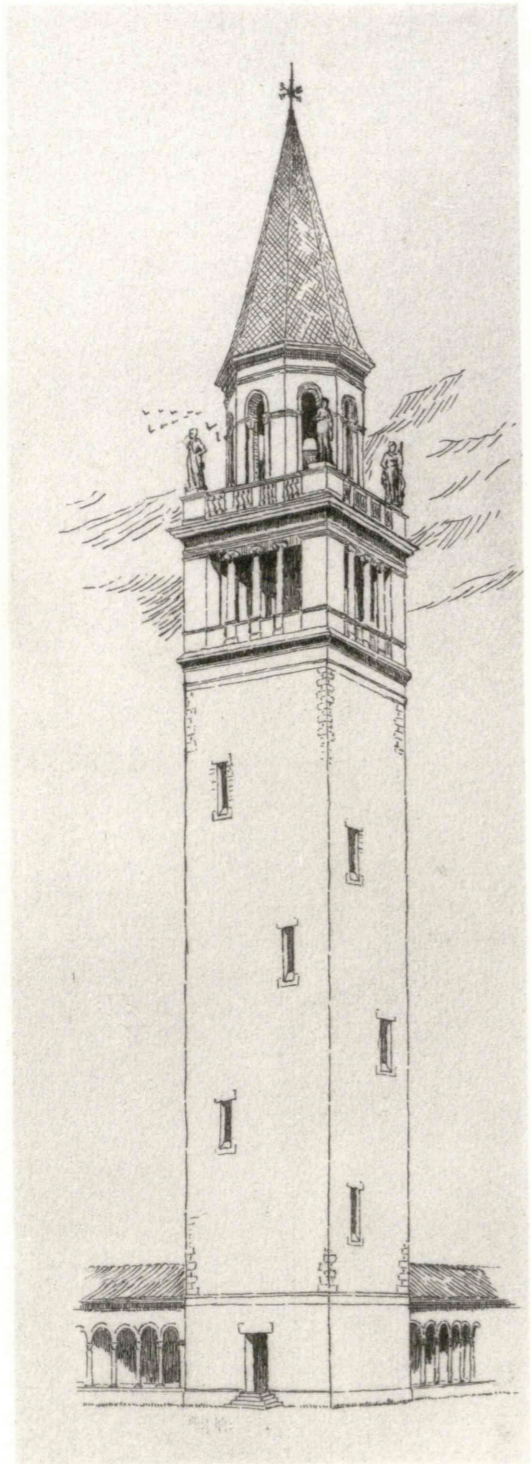


FIRST MENTION

J. MCA. VANCE.

PROBLEM IN DESIGN.
MASSACHUSETTS INSTITUTE OF TECHNOLOGY.
A PARK ENTRANCE.
THIRD YEAR.





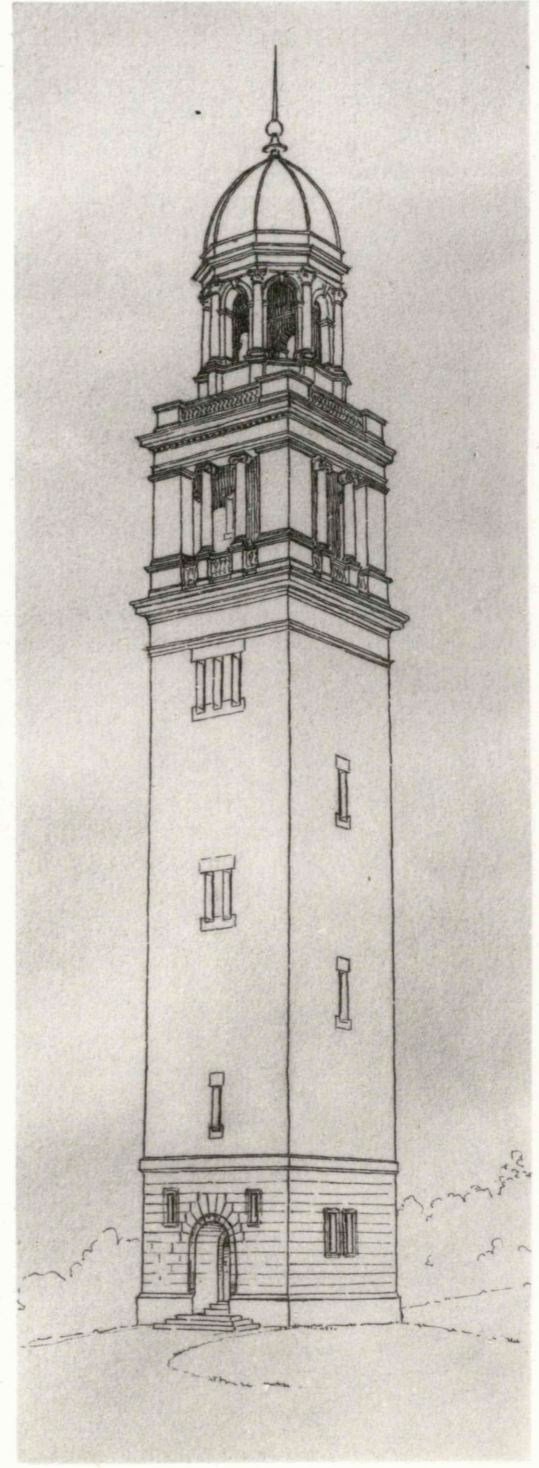
FIRST MENTION

F. N. REED.



SECOND MENTION

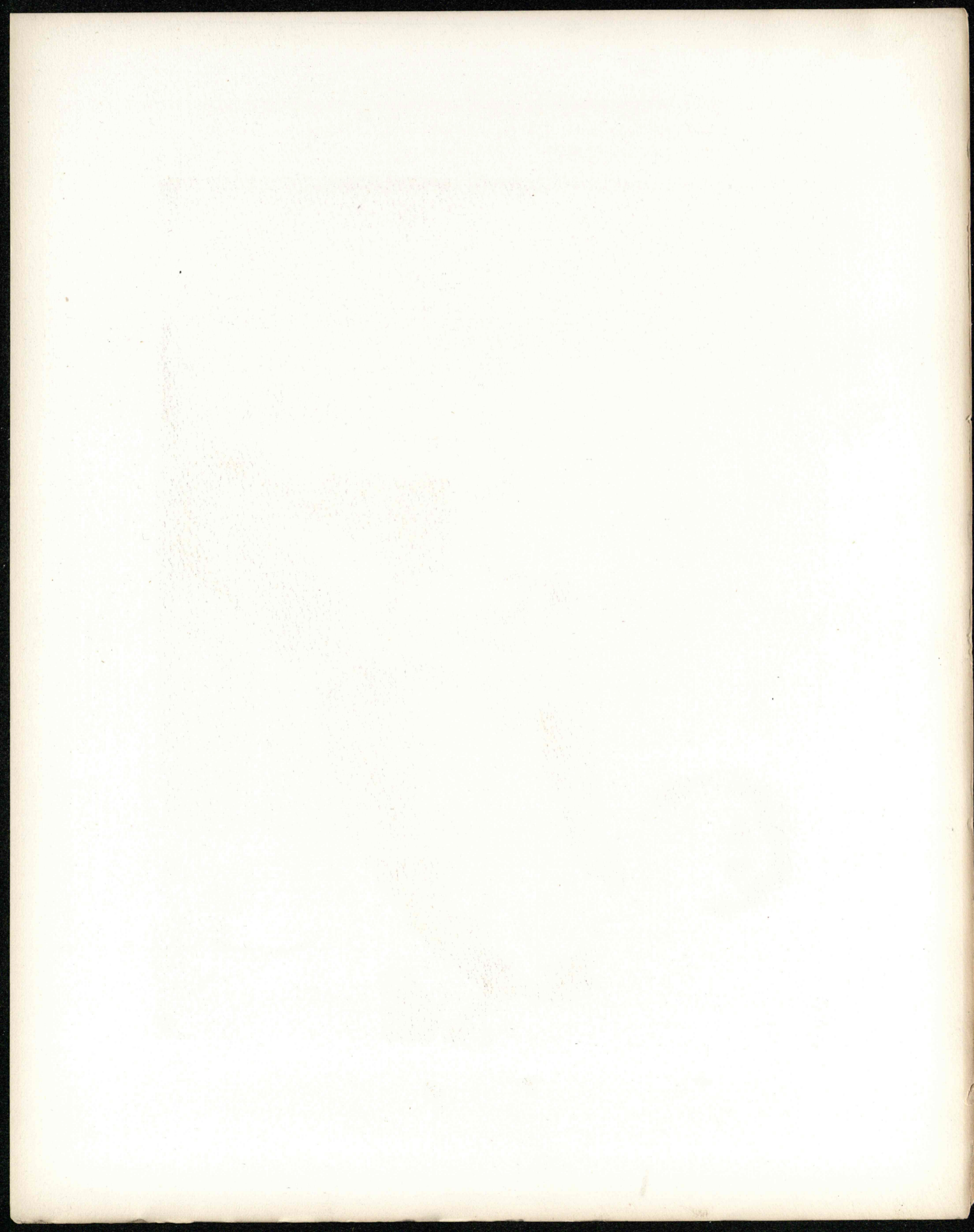
V. A. WRIGHT.



THIRD MENTION

E. V. SEELER.

PROBLEM IN DESIGN.
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY.
 A CAMPANILE.
 THIRD YEAR.



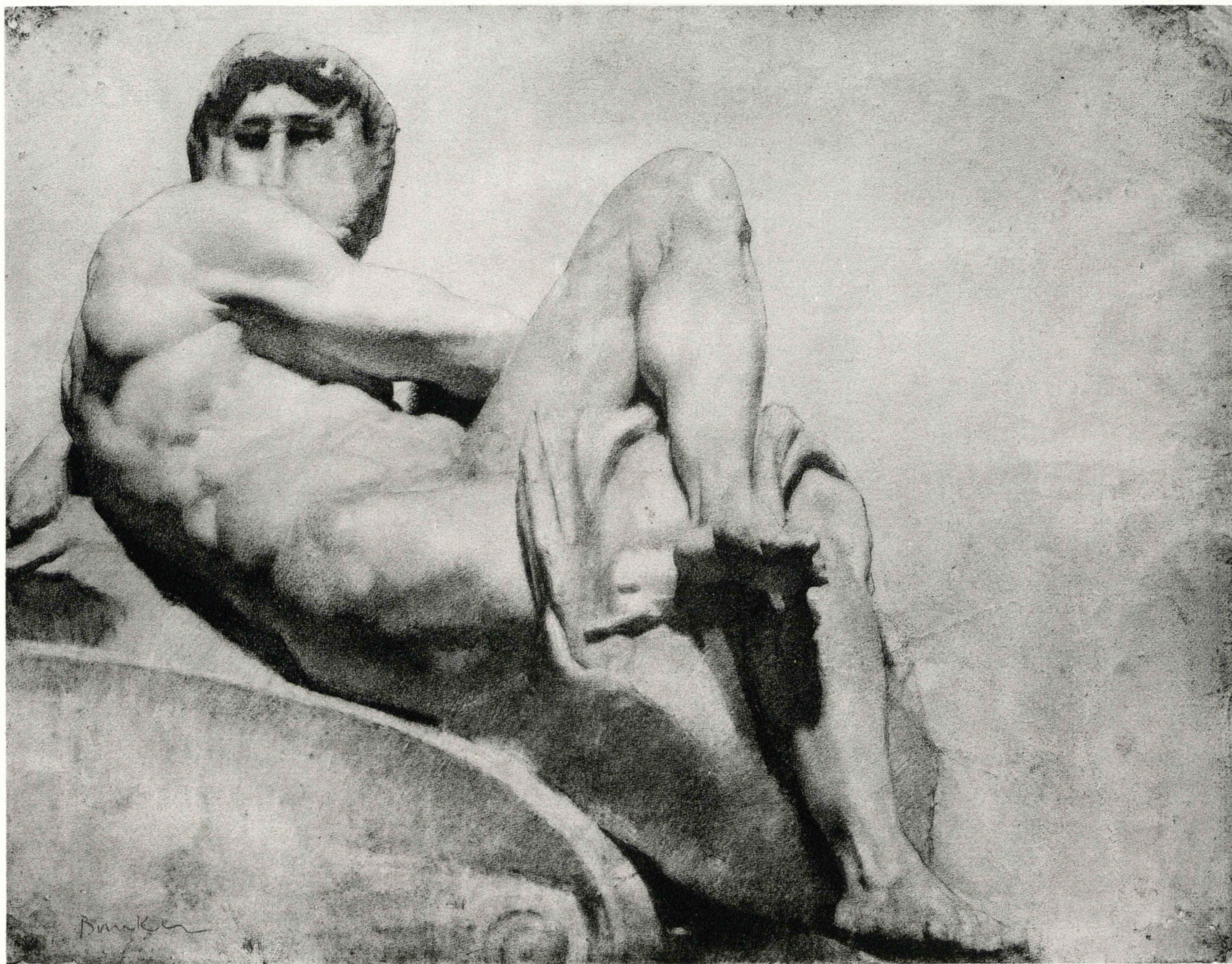
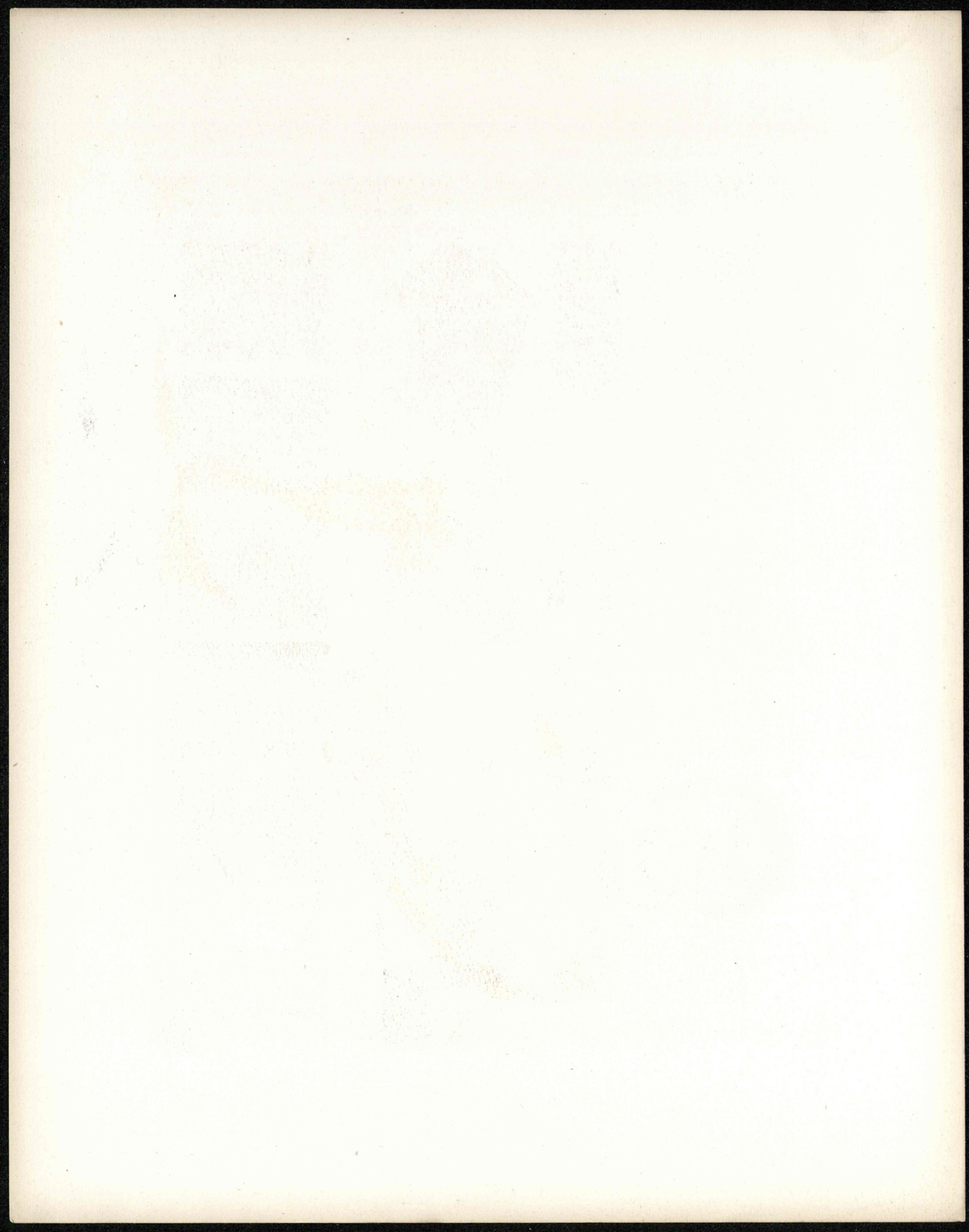


FIGURE FROM TOMB OF GIULIANO DE MEDICI, BY MICHAEL ANGELO, SAN LORENZO, FLORENCE.

DRAWING BY DENNIS MILLER BUNKER.

LOANED BY THE COWLES ART SCHOOL.



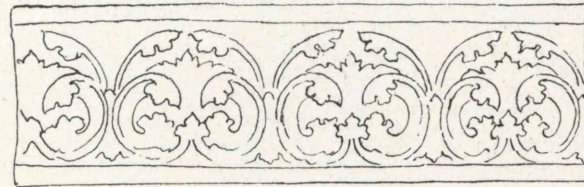
Gothic



Rheims

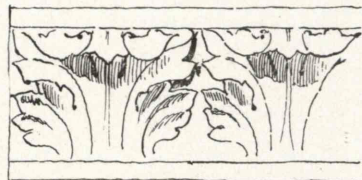


Rheims



Rheims

Examples of Belts and Friezes -



Venice



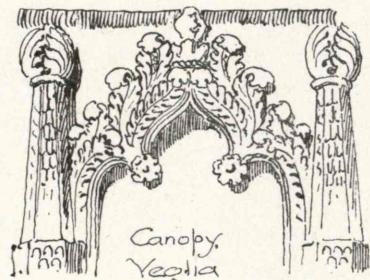
Veglia



Curzola



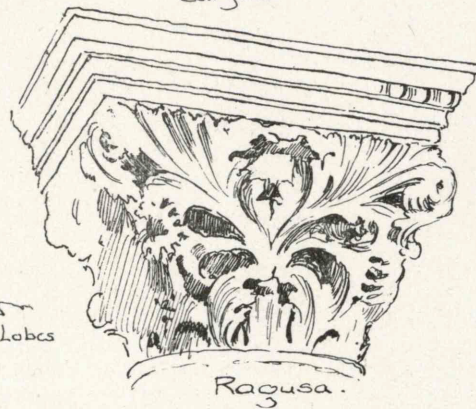
Dalmatia



Canopy
Veglia

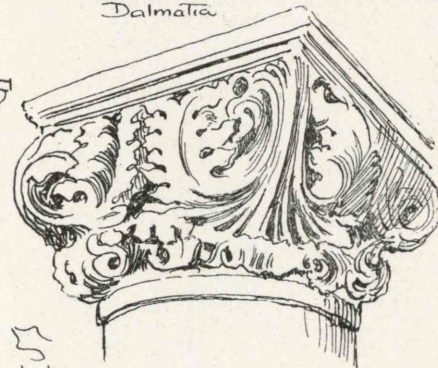


Cattaro



Lobes

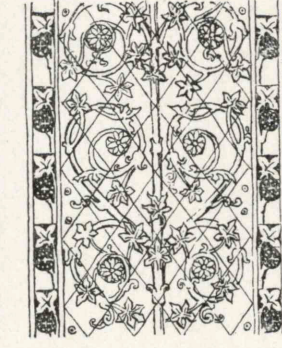
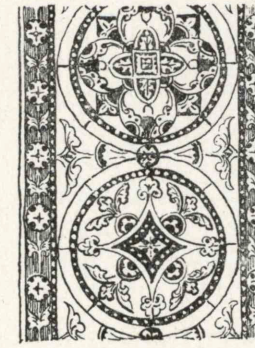
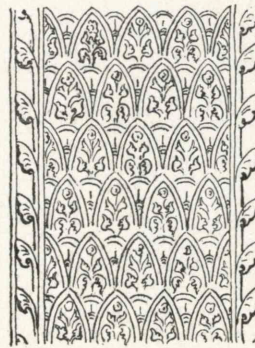
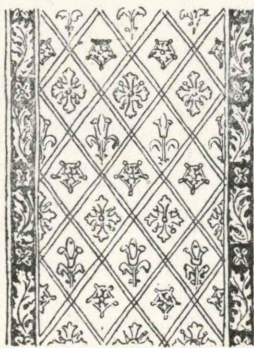
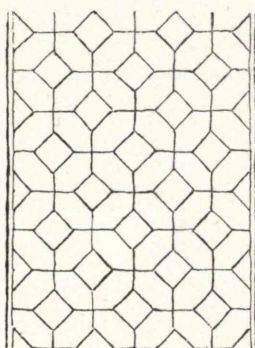
Ragusa.



Lobe

Curzola

Special types of leafage



Examples of Stained Glass.

