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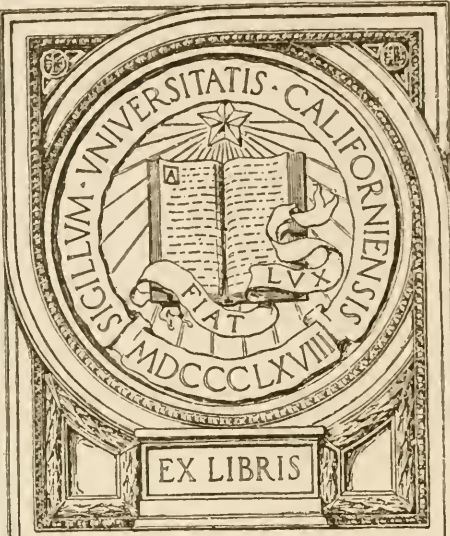
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THE METROPOLITAN MUSEUM
OF ART



ART EDUCATION

AN INVESTIGATION OF THE
TRAINING AVAILABLE IN
NEW YORK CITY FOR ARTISTS
AND ARTISANS



NEW YORK
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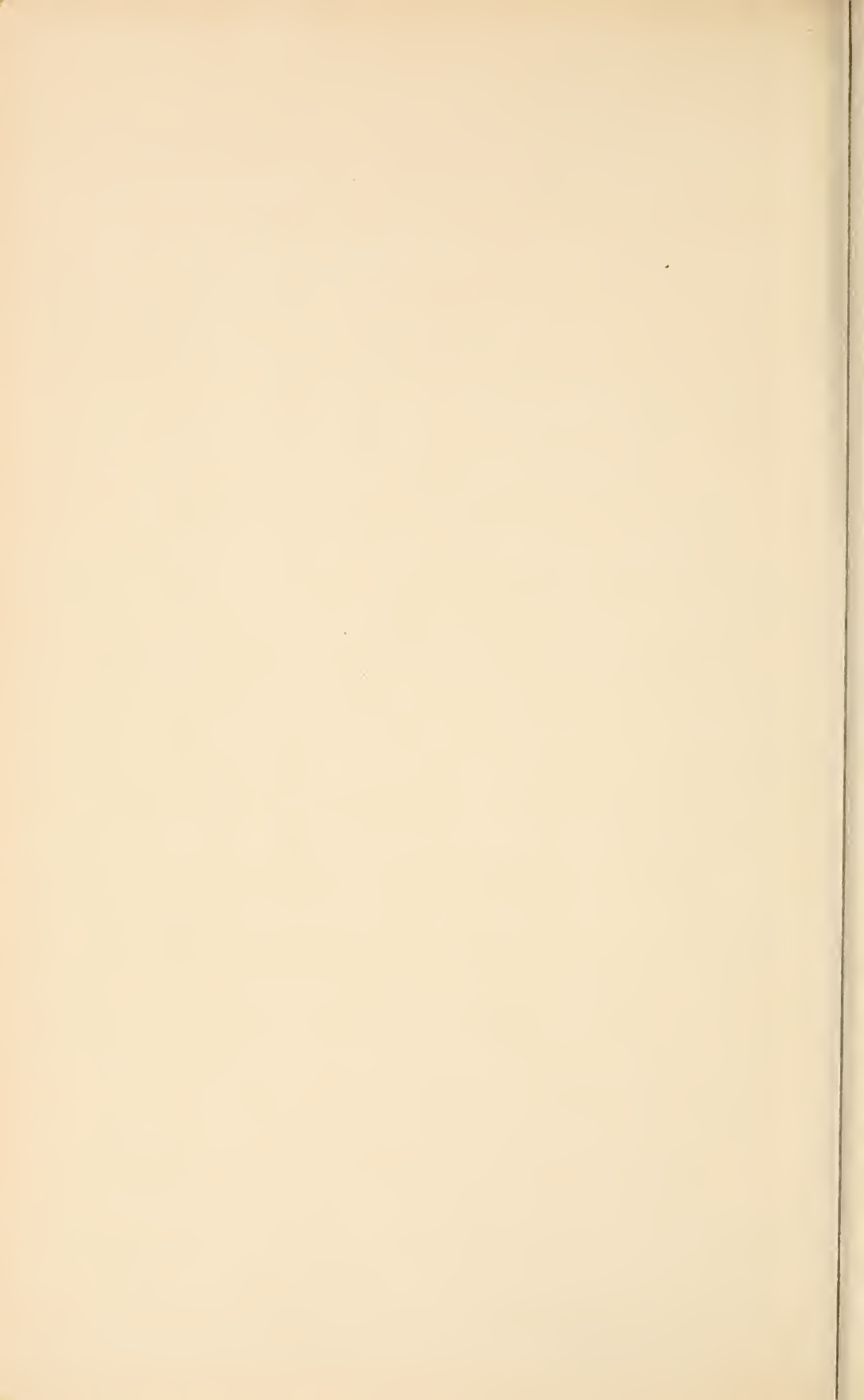
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THE METROPOLITAN MUSEUM OF ART

THE METROPOLITAN MUSEUM OF ART
NEW YORK

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ART EDUCATION: AN INVESTIGATION

PURPOSE OF THE STUDY

THIS intensive study of the industries in which art—line, mass, and form—plays a part, was undertaken by the Metropolitan Museum of Art for the purpose of bringing the Museum into closer touch with manufacturers and workers in the industrial arts and enabling the Museum to be of more practical service to artisans and to teachers both of the fine arts and of the industrial arts. It is hoped that this beginning may lead to further study of the needs and possibilities for industrial art education in New York City.

That this pamphlet may be of service in vocational guidance, we have tried to show clearly, on the one hand, the various industries in which young people with artistic inclinations may find congenial and profitable employment, and, on the other, where training in the art industries may be obtained. The number of blank spaces in the right-hand column of the list of industries indicates how many there are which can be learnt at present only by long years of work in the trade. The old apprenticeship system now exists only in a few lines and in modified form.

METHOD OF MAKING THE INVESTIGATION

THE list of industries was made after careful study of many reports of vocational surveys, notably those of Minneapolis in 1915; Cincinnati printing trades, 1914; and Cleveland building trades, 1916. The investigations carried on by the National Society for the Promotion of Industrial Education, particularly by the committee which coöperated in the Minneapolis survey under the chairmanship of Professor Charles R. Richards, Director of Cooper Union, and the addresses presented at the annual conventions of the National Society, have been freely drawn upon. Government reports used include the Thirteenth

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United States Industrial Census, 1910; the Report of the Commissioner of Labor on Industrial Education, 1910; the Industrial Directory of New York, 1913; and the Short-Unit Courses for Wage Earners issued by the U. S. Bureau of Labor Statistics, 1915. Help in the preparation of the list of trade schools was gained from the Directory of Trades and Occupations Taught at Day and Evening Schools in Greater New York, published by the Henry Street Settlement in 1909 and revised in 1916. The Scholarship Committee of the Henry Street Settlement has just issued a list of published reports of Investigations of Industries in New York City, 1905-1915.

The more detailed analyses of certain industries are the result of personal investigations, including interviews with heads of firms, designers, and foremen, and observation in workshops and studios. Some of the special studies have been condensed, by special permission, from printed reports and in each case credit is given.

The work along industrial art lines being carried on by the Board of Education of the City of New York in its secondary and vocational schools is here brought together for the first time. It was prepared through interviews and correspondence with the Chairman of the Committee on Vocational Education of the Board of Education, Mr. John Martin; the Director of Drawing in the High Schools, Dr. James P. Haney; the District Superintendent in charge of Evening Schools, Mr. Henry E. Jenkins; and principals of the various vocational schools and of the Evening Industrial Art School.

Answers to the questionnaire sent out by the Museum were received from 43 art schools, trade schools, and art classes in settlements. These, together with printed catalogues, have been analyzed. The total number of schools listed, exclusive of the public high schools that merely include drawing in their general course, is 61.

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STATISTICS

*Professionals*¹

	UNITED STATES			NEW YORK CITY		
	Total	Male	Female	Total	Male	Female
Architects	16,613	16,311	302	2,259	2,216	43
Artists, Sculptors, Teachers of Art	34,104	18,675	15,429	5,800	4,016	1,784
Designers				4,075	2,948	1,127
Draftsmen				2,933	2,885	48
Designers and Draftsmen ²	46,485	43,657	2,828			
Photographers				2,427	2,215	212
Totals	97,202	78,643	18,559	17,494	14,280	3,214

*Students*³

	UNITED STATES			NEW YORK CITY	
	Schools			Schools	Enrolment
	Listed	Reported	Enrolment		
Architecture	74	53	3,005	2	1,544
Academic	109	35	6,252	4	2,138
Fine and Applied				4	2,057
Design	70	5	1,266	1	676
Sculpture				1	92
Crafts	35	2	204		
Industrial	17	9	3,281	2	1,326
Normal	77	15	2,871	2	1,148
Evening	52	28	9,632	2	3,443
Summer	72	48	6,152	(5)	(1,631)
Totals	216	151	32,663	18	12,424

Statistics can never tell the whole story. Two of the schools in New York City that call themselves schools of fine and applied arts have important normal art departments; Teachers College, which is here counted as one of the normal art schools

¹ Thirteenth United States Census, 1910.

² Designers and draftsmen are grouped together in the national census and separately for New York City; photographers are not noted in the national census.

³ American Art Annual, Volume XI, 1914.

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and also as one of the industrial art schools, has two departments, Fine Arts and Industrial Arts; there is only one summer school which is not part of a winter organization and that, being a normal course, is counted with the normal group, so that all the summer registration in New York is a duplication; although only one school calls itself a school of applied design, design is taught at all except the four purely academic; the evening schools are chiefly devoted to draftsmen.

Considering all the above figures, it would seem that in the whole United States there are only about one third as many students in the artistic professions as there are men and women actually engaged in the work; in New York City there are about two thirds as many students as workers.

FACILITIES FOR THE STUDENT IN NEW YORK CITY

THE list of art schools in New York City at first glance seems long and might be supposed to be quite adequate. In reality many of the classes noted are hidden in most unexpected places, hence the great need for this list. Only one independent art school has its own building—the New York School of Applied Design for Women—the name of which, however, shows its limitations. The School of Practical Arts of Teachers College, Columbia University, is part of a large organization. There are certain advantages in this, for the student is thereby brought into direct contact with many broadening influences; also here a degree may be obtained. Other art schools are similarly situated as part of a large educational organization, but some valuable classes are struggling in very inadequate rented quarters.

Several schools are maintained in New York City with the direct coöperation of the trades. A notable example is the School for Printers' Apprentices which is supported jointly by the Employing Printers Section, Typographical Union No. 6, and the Hudson Guild; another is the Technical School for Carriage Draftsmen and Mechanics under the auspices of the Carriage Builders' National Association and the National Au-

tomobile Chamber of Commerce. The Mechanics' Institute of the General Society of Mechanics and Tradesmen maintains an evening school where over 2,000 young men are enrolled each year, chiefly in the various drafting classes. Another important center is Cooper Union, founded in 1854 by Peter Cooper "to be devoted forever to the union of Art and Science in their application to the useful purposes of Life." Here under one roof are a Museum for the Arts of Decoration, a Woman's Art School with day sessions, a Night Art School for Men, and day and evening School of Technical Science for Men and Women. The report of the Night Art School for Men for 1915-1916 shows 1,423 registered as follows: mechanical drawing 723, freehand drawing 451, decorative design 170, and modeling 79. An analysis of the occupations of these young men during the day shows that 380 are clerks, bookkeepers, etc.; 144 draftsmen; 111 designers and artists; 88 carpenters and woodworkers; 69 jewelers and silversmiths; 66 engravers and illustrators; 65 masons and builders; 65 salesmen; 57 teachers and students; 55 in clothing trades; 49 painters and decorators; 45 plumbers and ironworkers; 39 printers and electrotypers; 29 stone-cutters and wood-carvers; 14 electricians; 11 sign painters; 9 civil engineers; and 9 machinists.

When we come to examine what our public school system is doing for industrial art education we find that the only professional work being done in the day schools is at the Washington Irving High School, where there are courses in commercial design and in costume illustration that lead directly into the trades. In 24 of the evening high schools there are classes in mechanical, architectural, and freehand drawing; three of these schools teach commercial design, four costume illustration, one industrial design, one cabinet making, and one clay modeling. Through the coöperation of the District Superintendent in charge of the evening schools, 17 replies were received by the Museum from the request for information. The total registration in the art classes at these 17 evening high schools was 1,572, divided as follows: mechanical drawing 633; architectural drawing 264; freehand drawing 371; commercial design 90; industrial design 33; costume illustration

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319; cabinet making 44; and clay modeling 20. In October, 1913, the New York Evening Industrial Art School was opened in a building that is used during the day for an elementary school. Here highly specialized branches are taught to about 500 adults.

FLORENCE N. LEVY.

INDUSTRIES

THE following list gives the various occupations that require a knowledge of drawing, design, modeling, and color, or of any one of these or related courses. Processes and important branches of art study are also listed.

The second column analyzes the course of study, and an asterisk (*) shows that a further analysis, with information regarding wages, etc., is given in the chapter, page 21. The census figures are from the Thirteenth Census of the United States, 1910.

The third column indicates schools where the course is offered. The guide letters and numbers (Cutter library system) refer to the list of schools on page 29. Under general headings all schools are listed where the subject is taught; when a school distinctly offers a course in some special phase of the subject, only this school is noted; so it is always wise to use general headings as cross references. For instance, flower painting can be learnt in all schools that teach painting, but only one school offers Flower Painting as a separate subject.

INDUSTRIES	COURSES	SCHOOLS
Advertisement designing	Design; typography. See Design, Commercial; Sign-painting; Show-card writing.	N481; N483; P88; P96c; P96e; V851; W27
Aesthetics	Appreciation; history of architecture, sculpture, painting, ornament, and the minor arts; the place of art in the history of civilization.	B63; B79; C69; C691; C72; C722; C781; H89; M56; N21; N482; N483; P88; P96d; W58
Air-brush work	Color; design; mechanical ability. See analysis of Novelties.	
Anatomy	Lectures.	Ar7; C781; N21; P88
Antique	See Drawing, Freehand.	
Appreciation	See Aesthetics.	
Architecture—*Designing	Freehand and mechanical drawing; rendering; modeling; elements of architecture; architectural design; building	C69 elementary; C72 (degree); M46 elementary; P88; So2

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	materials; mathematics; estimating; interior design and decoration; history of architecture and general history of art. Census: 2,259.	
*Drafting	Mechanical drawing; development of details; lettering; tracing; blue-prints.	B791; C69; C72; C78; H35; M46; M96; M961; P882; P96h; P961c, d, e, h, l, n, o, s, u, w; So2; V851
Architecture, Naval	Drafting, specially adapted.	W38
Artificial flowers	See Flowers, Artificial.	
Artificial stone	See Stone, Artificial.	
Automobiles	Drafting; freehand drawing; carpentry; upholstery; painting. Census: 56 firms making automobiles, including bodies and parts; 2,326 employed, of whom 31 are proprietors and 316 salaried.	T22
Badges, Banners	Design; color; heraldry. Census: 50 firms making badges, banners, flags, and emblems; 678 employed, of whom 56 are proprietors and 92 salaried.	
Baskets	Design. See Weaving. Census: 26 firms making basket, rattan, and willow ware; 462 employed, of whom 26 are proprietors and 35 salaried.	B79; C722; H39; N483; P88
Beadwork	Design; color.	
Blacksmithing	Design; modeling; color. Metalwork.	See N484
Block-printing	Design; color; technical ability in cutting the wood or linoleum.	C722; P88
Blue-prints	Mechanical drawing. Working drawings.	See
Boat-building	See Ship-building.	
Boiler-making	Drawing, specially adapted.	M96
Bookbinding	Design; color; tooling; inlaying; sewing; forwarding.	Et3 and H89 pre-vocational; P88; P961s; V851 trade; W27 pre-vocational
Book-cover designing	Design for steel die.	C722; N482

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Book-making	See Graphic arts.	
Book-plate designing	Design, usually for engraving.	
Box-making—Fancy	Design of shape; decoration of cover. Census: 211 firms; 8,018 employed, of whom 244 are proprietors and 564 salaried. See analysis of Novelties.	
	Wooden	Carpentry. C86
Braiding	Design; color.	
Brass-working	See Metalwork and Foundry practice. Census: 163 firms making brass and bronze products; 4,197 employed, of whom 157 are proprietors and 476 salaried.	
Bricklaying	Reading and making working drawings.	N484
Bridge-building	Design; drafting. Included in Civil engineering.	P76
Bronze casting	Modeling; design; color. See Foundry practice and analysis of Metalwork.	C722; P76; P882
Building trades	Bricklaying, cabinet making, carpentry, cement and concrete, hardware, interior decorating, lighting fixtures, masonry, painting and decorating, plaster, plumbing, sheet-metal, stone-cutting, structural ironwork, terracotta. See these headings.	
Buttons	Design; occasionally decorated by hand.	
Cabinet making	Blue-print reading and making; furniture design; history of styles. See Woodworking.	B26; B791; C722 furniture design and shopwork; H35; M961; P882; P961u; V851
Candles	Modeling; coloring; mold-making.	
Cards	Postal, greeting, place, etc. Design for reproduction; hand coloring; air-brush work. See Design, Commercial, and analysis of Novelties.	

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Caricaturing	See Illustrating.	
Carpentry	Blue-print reading and making; geometrical, mechanical, and freehand drawing. See Woodworking.	B26; B791; C43a, f; G85; H35; M96; M961; N484; P76; P882; V851
Carpets and rugs	Design; color; technical knowledge. Census: 5 firms; 256 employed, of whom 7 are proprietors and 34 salaried.	Design: C722; C781; N481; N482; N483; P88
Carriages	Drafting. See Automobiles.	
Cartoon	The working drawing for stained glass or mural decoration. See Painting, Mural.	
Cartooning	Drawing (for newspapers, usually comic). See Illustrating.	
Carving	Drawing; modeling.	Wood: C722, F87, H35, and P88. Stone: S02
Case-making	Working drawings; color; pasting. Census: 57 firms making jewelry and instrument cases; 878 employed, of whom 66 are proprietors and 76 salaried.	M31
Casting	Drafting; modeling. See Bronze, Concrete, Plaster.	
Ceramics	See Clay-working.	
Chasing	Drawing; modeling. See Metalwork.	C722; N483; P88
Chemical engineering	Mechanical drawing.	C721; P76; P882
Children's classes	Drawing; design; painting in water colors; pre-vocational industrial arts. For children under 14.	Ar7; B71; G85; H39; M56; N31; N483; Un3
China decorating	Design; mineral painting; firing.	N483; P88
Civil engineering	Mechanical drawing.	C721; C782; P76
Clay-working	Modeling; drawing; design; color; chemistry. Census: 10 firms making fire-clay products, including pottery and terracotta; 647 employed, of whom 2 are proprietors and 65 salaried.	C722; Et3 pre-vocational; G85; M72; N481; N483; P88

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*Illustration	Drawing; color; reproductive processes.	C722; C781; H351; M31; M72; N481; N482; N483; P88; P961a, b, f, l; W27; Y81
Cover design	Design. See Design, Commercial.	N482
Craft work	Basketry; bookbinding; china painting; clay modeling; jewelry; leatherwork; metalwork; pottery; silversmithing; wood-carving, etc. All require design and technical ability. See under each heading.	B79; C722; N481; N483; P88; P96
Criticism, Art	Aesthetics; history of art; technical ability valuable. See History of Art.	
Decoration	See Interior decorating; Modeling; Novelties; Painting.	
Dentistry, Mechanical	Modeling; color.	Sch6
Design—*Applied	Theory and practice of space division, light and dark, and color; decorative treatment of natural forms and the application of decorative elements to different materials; historic ornament. See each industry for special courses. Census: 4,075.	C69; C722; C78; C781; Et3 pre-vocational; H39; H89; M46; M72; N481; N482; N483; N485; P88; P96; P961u; Sa2; W27; Y81
*Commercial	Theory and practice of design, color, and lettering as these relate to printing and advertising; technical rendering in various media; familiarity with methods of reproduction.	Ar7; C722; N31; N481; N482; N483; N485; P88; P96c; P96e; P961a, q, w; V851; W27; Y8a; Y81
Die sinking	Modeling; engraving. See Metalwork.	B791; C722; H35; P88; V851
Drafting—*Architectural	Mechanical and technical drawing of plans, elevations, details of construction; rendering in water color; lettering; classic orders. See analysis of Architecture.	C69; C72; C78; H35; M46; M96; M961; N482; P88; P961c, d, e, h, k, m, n, o, s, u, w; So2; V851
Garment	Design and cutting for tailors and dressmakers.	B791; C722; M31; M96; P881; W27; Y81

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Geometric	Mechanical drafting "to enable students to form mental images of objects from various standpoints before actually depicting them."	C69; C721; P76
Marine	Special technical knowledge.	M46; W38
Mechanical	Reading and making of blue-prints and working drawings; tracing; sketching details, developing them and assembling; lettering. Required in all mechanical trades and practically all industries. Special types are listed under respective subjects. Census: all draftsmen, 2,933. See analysis of Architecture.	B26; B791; C69; C721; C78; C782; H35; H67; M46; M96; M961; N484; P76; P882; P96b, g, h; P961c, d, e, g, h, i, k, m, n, o, q, r, t, u, w; V851; Y8a
Drawing—Freehand	Used more or less in all fine and applied art.	All schools
Antique	From cast, usually with charcoal.	Ar7; C69; C72; C722; C78; C781; H89; M46; M72; N21; N482; N483; P88; So2
Architectural	Sketching architectural subjects. See Architecture.	
Life	Figure, nude and draped, usually with charcoal.	Ar7; B71; C722; C78; C781; M46; M72; N21; N481; N483; P88; So2
Plant	Usually in pencil.	C722; C781; M72; N481; N482; N483; N485; P88; W27
Still-life	Usually in pencil and charcoal.	Ar7; C722; C781; N21; N482; N483; P88; P96
Dressmaking	Cutting; fitting; sewing. See Costume Design and Costume Illustration.	C34a, b, c, d, f, g; C54; C722; F87; H351; In7; M31; P881; W27; Y81; Y83
Dyeing	Color theory and practice; chemistry.	C722; P882
Editing, Art	Design; layout; typography; reproductive processes; aesthetics; history of art.	

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Electrical engineering	Mechanical drawing.	C721; C782; P76; P882
Electrical industries	Drafting, including blue-print reading, for telephone and telegraph circuits, switchboards, and motors.	B26; C721; E12; M46; M96; N484; P76; P882
Embossing	See Design, Commercial, and Printing.	
Embroidery	Design; stamping; transferring; use of pantograph. Special designs and technique for white goods; for machine embroidery, knowledge of Bonnaz machine and others.	Design: C722; H351; M31; P881; Y81. Hand work: C43a, c, d, e, f; C86; In7; P37; Scu6; Y81; Y83. Machine work: C43c and M31
Enameling	Design; color; different techniques on metal, wood, etc. See Metalwork and Novelty. Census: 11 firms doing enameling and japanning; 67 employed, of whom 13 are proprietors and 4 salaried.	C722; N483; P88
Engineering	Mechanical drawing for architectural, chemical, civil, electrical, fire, gas, marine, mining, municipal, naval, railroad, sanitary, steam, and water engineers. See Drafting.	B26; C721; C78; C782; M46; P76; P882
Engraving	Freehand drawing; composition; color; chemistry. Technical processes vary when engraving on copper, steel, glass, or wood; photo-engraving, engraving rolls for printing fabrics or wall-paper.	C722; P88
Etching	Freehand drawing; composition; color; chemistry.	Ar7; C722; N21
Fashion work	See Costume Illustration.	
Feathers	Color. See Flowers, Artificial.	
Films	See Moving pictures.	
Fine arts	See Architecture; Illustrating; Painting; Sculpture.	
Flags	See Badges.	
Flower arrangement	Design; color.	

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- Flower painting See Painting, Flower.
- Flowers, Artificial Color; modeling; drawing. Y81
 Census: 312 firms making artificial flowers and feathers; 9,759 employed, of whom 411 are proprietors and 899 salaried.
- Forging Design; modeling. See C722; N484;
 Metalwork. P76; P882
- Foundry practice Modeling; design; technical C722; P76; P882
 processes, including preparation of sand molds, metal and wooden patterns, pouring, and cleaning castings. Census: 923 firms which are foundries and make "machine shop products"; 29,200 employed, of whom 758 are proprietors and 4,428 salaried. See analysis of Metalwork.
- Frames Design; modeling; carving.
 Census: 115 firms making picture and looking-glass frames; 1,509 employed, of whom 122 are proprietors and 207 salaried.
- Furniture—Designing Freehand drawing; mechanical C722
 drafting, with special reference to construction details; color; pattern making; decorative styles.
- Making Reading of working drawings; cabinet-making; carving; upholstery. Census: 406 firms making furniture and refrigerators; 9,878 employed, of whom 464 are proprietors and 1,000 salaried.
- Salesmanship Interior decoration, simplified; historic styles. Y8b
- Gardening Composition; color; landscape gardening simplified.
- Garment drafting See Drafting, Garment.
- Geometric drafting See Drafting, Geometric.
- Gilding Color; special technique for wood, metal, glass, etc. See Painting, Decorative.

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Glass	Blown, cut, engraved, leaded, mosaic, painted, stained—all need design. Census: 9 firms making glass; 948 employed with 3 proprietors and 61 salaried. Glass cutting, staining, and ornamenting, 111 firms; 2,360 employed, of whom 126 are proprietors and 182 salaried; value of product \$3,448,000, more than half being due to manufacture.	Design: C722; C781; N481; N482; N483; P88
Goldsmithing	Design; modeling; color; chemistry. See Jewelry, Metalwork, Silversmithing.	P88
Graining	See Staining.	
Graphic arts	Design and color for reproduction. See Design, Commercial; Bookbinding; Block-printing; Color-printing; Embossing; Engraving; Etching; Illuminating; Illustrating; Lettering; Lithography; Photo-engraving; Printing; Typography.	
Guns	Mechanical drafting. See Metalwork. The best guns are entirely made by hand, but the majority are stamped out by machinery and finished by hand.	
Hammering	See Metalwork.	
Hardware	Design; pattern-making. See Metalwork. Classed as: architectural, cutlery, flat-ware, gates and railings, handles and hinges, hollow-ware, heating appliances, lighting fixtures, locks and keys.	
Heraldry	Design; color; heraldic history.	
History of Art	Lectures; visits to galleries; pencil sketching to train sense of appreciation; principles of design, color, and decoration; periods of art as related to history.	B63; B79; C72; C722; C781; M56; N21; N482; N483; P88; P96d
Horology	See Clocks.	

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- House-painting—Interior Theory of color; chemistry B26; N484; So2
and mixing of paints; free-
hand painting of ornament;
designing and cutting of stencils;
preparation of plaster
walls and kalsomining; staining,
graining, and finishing of
wood; technique of fresco,
oil, and water colors.
- Exterior Theory of color; chemistry B26; N484
and mixing of paints.
- Household design See Interior decorating.
- Illuminating Drawing; design; color; ty- C722
pography; special technique.
- Illustrating Drawing; painting; composi- Ar7; C722; C781;
tion; design; lettering; anat- M72; N21;
omy; history of art; repro- N481; N482;
ductive methods. See also N483; P88; Y8a;
Costume Illustration; Design, Y81
Commercial.
- Instruments Reading and making of work- H35
ing drawings; geometrical
drawing; lettering. Census:
63 firms making professional
and scientific instruments;
1,358 employed, of whom 55
are proprietors and 222 sal-
aried.
- Interior decorating *Application of laws of color C722 (degree);
and design; knowledge of ma- C781; M72;
terials such as wall-paper, N481; N482;
carpets, hangings, etc.; prin- N483; P88;
ciples of constructive design P96i; Y8b
as applied to furniture; deco-
rative styles; rendering of
sketches; detailed working
drawings.
- Iron—Architectural See Drafting, Architectural.
Ornamental See Metalwork.
Structural See Drafting, Mechanical.
Wrought See Forging.
- Jacquard design See Textiles.
- Jewelry Design; modeling; color; C43e; C722;
chemistry; numerous pro- N481; N483;
cesses requiring special tech- N485; P88
nical training. Census: 438
firms; 6,668 employed, of
whom 553 are proprietors
and 1,076 salaried. See
analysis of Metalwork.

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Glass	Blown, cut, engraved, leaded, mosaic, painted, stained—all need design. Census: 9 firms making glass; 948 employed with 3 proprietors and 61 salaried. Glass cutting, staining, and ornamenting, 111 firms; 2,360 employed, of whom 126 are proprietors and 182 salaried; value of product \$3,448,000, more than half being due to manufacture.	Design: C722; C781; N481; N482; N483; P88
Goldsmithing	Design; modeling; color; chemistry. See Jewelry, Metalwork, Silversmithing.	P88
Graining	See Staining.	
Graphic arts	Design and color for reproduction. See Design, Commercial; Bookbinding; Block-printing; Color-printing; Embossing; Engraving; Etching; Illuminating; Illustrating; Lettering; Lithography; Photo-engraving; Printing; Typography.	
Guns	Mechanical drafting. See Metalwork. The best guns are entirely made by hand, but the majority are stamped out by machinery and finished by hand.	
Hammering	See Metalwork.	
Hardware	Design; pattern-making. See Metalwork. Classed as: architectural, cutlery, flat-ware, gates and railings, handles and hinges, hollow-ware, heating appliances, lighting fixtures, locks and keys.	
Heraldry	Design; color; heraldic history.	
History of Art	Lectures; visits to galleries; pencil sketching to train sense of appreciation; principles of design, color, and decoration; periods of art as related to history.	B63; B79; C72; C722; C781; M56; N21; N482; N483; P88; P96d
Horology	See Clocks.	

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- House-painting—Interior Theory of color; chemistry B26; N484; So2
and mixing of paints; free-
hand painting of ornament;
designing and cutting of stencils;
preparation of plaster
walls and kalsomining; stain-
ing, graining, and finishing of
wood; technique of fresco,
oil, and water colors.
- Exterior Theory of color; chemistry B26; N484
and mixing of paints.
- Household design See Interior decorating.
- Illuminating Drawing; design; color; ty- C722
pography; special technique.
- Illustrating Drawing; painting; composi- Ar7; C722; C781;
tion; design; lettering; anat- M72; N21;
omy; history of art; repro- N481; N482;
ductive methods. See also N483; P88; Y8a;
Costume Illustration; Design, Y81
Commercial.
- Instruments Reading and making of work- H35
ing drawings; geometrical
drawing; lettering. Census:
63 firms making professional
and scientific instruments;
1,358 employed, of whom 55
are proprietors and 222 sal-
aried.
- Interior decorating *Application of laws of color C722 (degree);
and design; knowledge of ma- C781; M72;
terials such as wall-paper, N481; N482;
carpets, hangings, etc.; prin- N483; P88;
ciples of constructive design P96i; Y8b
as applied to furniture; deco-
rative styles; rendering of
sketches; detailed working
drawings.
- Iron—Architectural See Drafting, Architectural.
Ornamental See Metalwork.
Structural See Drafting, Mechanical.
Wrought See Forging.
- Jacquard design See Textiles.
- Jewelry Design; modeling; color; C43e; C722;
chemistry; numerous pro- N481; N483;
cesses requiring special tech- N485; P88
nical training. Census: 438
firms; 6,668 employed, of
whom 553 are proprietors
and 1,076 salaried. See
analysis of Metalwork.

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Joinery	Blue-print reading and making; mechanical drawing. See Woodworking.	B26; B791; H35; M96; M961
Labels and trade-marks	See Design, Commercial.	
Lace	Design for both hand and machine made, including curtains; making by hand.	Design: N482 and P96i. Hand-made: H351; P37; P881; and Scu6
Lacquering	Design; color. See Painting, Decorative, and Enameling.	
Lamp and candle shades	Design. See analysis of Novelties.	M31
Landscape architecture	Design; color; horticulture.	
Landscape painting	See Painting.	
Lantern slides	Coloring by hand. See Photography.	
Lapidary work	Modeling; design. See analysis of Jewelry under Metalwork.	C722; N481; N483; P88
Layout	Drawing; design. See Costume Illustration and Design, Commercial.	N483; W27
Leather	Design; color; tooling; tanning. See Bookbinding.	C722; F87; N483; P88; P882 tanning
Lecturing	See Criticism, Art.	
Lettering	Design; special technique. See Design, Commercial; Drafting, Architectural and Mechanical; Show-card writing; Sign-painting.	B26; C722; H89; M96; M961; N31; N481; N482; N483; N484; P88; P96; P961s; W27
Lighting fixtures	Design. See Metalwork. Census: 149 firms; 5,900 employed, of whom 127 are proprietors and 916 salaried.	C722
Linoleum	Design. See Oilcloth.	
Linoleum block-printing	Design.	C722
Lithography	Freehand drawing; color. See Design, Commercial.	M96
Locksmithing	Design. See Metalwork.	
Machines—Designing	Design of detailed parts of steam and gas engines.	C721; C782; H67; P76; P882

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- Drafting Blue-print reading and making; sketching and developing details of cams, gears, and other devices; assembling. B26; C721; C782; H67; M46; P76; P882
- Managing art department Executive ability in supervising and buying commercial design; theory of design and color; technical ability valuable but not necessary.
- Marble-cutting Mechanical drawing. See M96
Masonry and Stone-cutting.
- Marbling See Staining.
- Marine drafting See Drafting, Marine.
- Masonry Mechanical drawing. See M96; N481; N484; V851
Drafting, Mechanical.
- Mechanical drawing See Drafting, Mechanical.
- Metalwork *Design; modeling; mechanical drafting. See Blacksmithing; Boiler-making; Brass-working; Bronze casting; Forging; Foundry practice; Goldsmithing; Hardware; Jewelry; Silversmithing. C721; C722; F87; H35; N481; N483; N484; N485; P76; P88; P882
- Millinery Design; color. Frame-making is a separate industry. Less skill required in needlework than for dressmaking, but more artistic taste. C43b, c, d, f, g; C54; C722; H351; In7; M31; P881; Y81; Y83
- Miniature painting See Painting.
- Modeling—General Drawing; design; composition; modeling in relief and in the round from the figure and decorative forms; anatomy; construction of armatures; casting; enlarging; history of art. See Sculpture. Ar7; C722; C78; C781; M46; M72; N21; N481; P961v
- Architectural The above and architectural styles. Ar7; M46; M481; So2
- Decorative The above with special work in adaptation of natural forms to decoration; decorative styles. For potters, plasterers, stone cutters, metal workers, die makers, etc. C781; M46; N481; P88; So2; V851
- Mold-making See Pattern making.
- Mosaic Design; color. Technical process varies little whether clay, glass, or wood. C781; N481; N482

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Moving pictures	Design; color. See Scene painting; Costume design.	
Mural painting	See Painting, Mural.	
Musical instruments	See Furniture.	
Naval architecture	See Architecture, Naval.	
Needlework, Artistic	See Embroidery.	
Normal training	See Teaching art.	
Novelties	*Design; application of the decoration by hand, usually by painting and pasting. Census: 156 firms making "fancy articles"; 3,649 employed, of whom 172 are proprietors and 532 salaried; value \$6,-987,000, nearly two-thirds due to manufacture.	C781; F87; H351; M31; N481; N482; N483; P88; P96; W27; Y81
Object drawing	See Drawing, Freehand.	
Oilcloth	Design.	N482
Oil painting	See Painting.	
Optical goods	Mechanical drafting.	
Ornament, Historic	See Styles, Historic.	
Pageantry	See Stage-craft.	C722
Paint manufacture	Color; chemistry. Census: 113 firms; 4,319 employed, of whom 60 are proprietors and 1,457 salaried.	
Painting—Academic	Preparation for painting of easel pictures. Drawing from antique, life and still-life; perspective; anatomy; color theory and chemistry with technical work in oil and water color; composition; aesthetics; history of art.	Ar7; C722; M72; N21; N483; P88
Animal	Same requirements as Academic.	C722
Architectural	Rendering of plans and schemes for exteriors and interiors, usually in water color.	C72; C722; C781; M72; N481; N482; N483; P88; P96i; So2; Y8
Ceramic	Mineral colors on glass and porcelain.	N483
Decorative	Design applied as in enameling, gilding, lacquering, novelties, stenciling, block-printing, etc.; see these.	C722; C781; F87; H351; M31; M72; N481; N482; N483; P88; W27; Y81

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Figure	Draped model.	All academic and B71; C722; C781; N481; N482; W27
Flower	Chiefly in water color.	All academic and N482
Genre	Figure subjects, story-telling; same requirements as Aca- demic.	
House	See House painting.	
Landscape	Same requirements as Aca- demic.	Ar7; C722; N21
Life	Nude figure.	All academic and N481
Miniature	Usually in water color on ivory.	Ar7
Mural	Drawing; perspective with special reference to location of the decoration; color theory and chemistry; and all other requirements of academic painting, of which this is the highest type, the decoration being planned to fill a given space. See Painting, Aca- demic.	Ar7; M72; N21; N481; S62
Portrait	Same requirements as Aca- demic.	Ar7; C781; M72; N21; N483; P88
Poster	See Posters and Design, Commercial.	
Scene	See Scene painting.	
Sign	See Sign-painting.	
Still-life	Same requirements as Aca- demic but more elementary.	All academic and B71; C781; P96
Paper goods	Boxes, cards, stationery, etc., decorated in part or wholly by hand. See Novelties.	
Parasols	Modeling for handles; design for covering and occasionally hand decoration as Novelties.	P96i
Pasting	Required for Novelties.	M31
Patent office drafting	See Drafting, Mechanical.	M46
Patina	Coloring of metals. Color; chemistry.	C722; P88

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Pattern making	Reading and making of working drawings; freehand sketching; mechanical drawing; drafting details; modeling; special technique of metal, plaster and wood molds. Census: 96 firms making models and patterns; 1,094 employed, of whom 110 are proprietors and 130 salaried. See analysis of Metalwork.	C722; C782; H35; H67; N484; P76; P882; V851
Pen-and-ink drawing	Special technique. See Design, Commercial, and Costume Illustration.	
Pencil drawing	Special technique.	C722; P96
Period decoration	Historic style in furniture and ornament. See Styles.	
Perspective	Representation of solid objects upon a flat surface.	B791; C69; C72; C722; C781; M961; N21; N482; P88; P882
Photo-engraving	Freehand drawing; photography; air-brush and freehand retouching. Census: 46 firms; 1,517 employed, of whom 25 are proprietors and 305 salaried.	V851; W58
Photography	Composition; chemistry; operating; retouching; mounting; coloring. See Novelties for coloring. Census: 2,427.	B79; C722; W58
Plan reading	See Working drawings.	
Plaster	See Modeling, Decorative.	N484 cornicing
Plastic arts	See Modeling.	
Plumbing	Working drawings with special reference to steam, hot water and gas.	B26; M961; N484; V851
Porcelain	See Clay-working.	
Postcards	See Novelties.	
Posters	See Design, Commercial.	Ar7; C722; M72; N31; N481; N482; N483; P88; P96c, h; W27
Pottery	See Clay-working.	G85; N483; P88

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Printing	Type arrangement; light and dark; lettering; working drawings. See Design, Commercial. Census: 2,883 printers and publishers; 74,118 employed, of whom 2,352 are proprietors and 23,444 salaried.	B26; B791; C43c; M96; M961; N484; Sch7; V851
Repoussé	See Jewelry.	
Salesmanship	Design; color; composition.	Y8
Sample mounting	Color; pasting.	M31
Sanitary engineering	Mechanical drawing.	C721; P76
Scene painting	Design; color; requirements of the academic and mural painter and of the commercial designer.	C722; N31
Sculpture	Modeling; drawing; composition; anatomy; aesthetics; history of art; technical ability of the highest order.	Ar7; C78; N21
Sewing	See Dressmaking; Embroidery.	
Sheet-metal	Mechanical drafting.	B26; M46; N484; V851
Ship-building	Drafting of special type known as marine. Census: 71 firms of ship and boat builders; 4,328 employed, of whom 66 are proprietors and 240 salaried.	M46; W38
Show-card writing	Design; lettering; freehand and mechanical drawing; typography; special pen-and-ink technique. See analysis of Commercial Design.	M96; M961; V851
Sign-painting	Design; color; lettering; layout; preparation of surfaces—wood, metal, glass, oil-cloth, canvas. See analysis of Commercial Design.	B26; C43c, g; M96; M961; N484; Sa2; V851
Silversmithing	Design; modeling; hammering and other processes. See analysis of Metalwork. Census: 42 firms; 1,852 employed, of whom 43 are proprietors and 368 salaried.	C722; N481; N483; N485; P88
Sketching	Quick drawing, usually in pencil.	Ar7; C722; H89; N481; N482; N483; W27

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Stage-craft	Design; composition; color; C722; N31 aesthetics. Includes stage setting, costume design, scene painting.
Staining	Color; design. Effects on wood, stone, metal, etc. B26
Stamping	Design; perforation and transfer of patterns for embroidery, etc. M31
Stamps, Hand	Lettering. See Design, Commercial. Census: 46 firms making hand stamps, stencils and brands; 436 employed, of whom 45 are proprietors and 75 salaried.
Stationery	See Design, Commercial; Novelties.
Stenciling	Design; cutting of stencil; color theory; application of color. C722; N31; P88
Stone, Artificial	Design; modeling; reading and making of working drawings for cement, concrete, etc. Census: 24 firms; 266 employed, of whom 13 are proprietors and 26 salaried. C722; P88
Stone-cutting	Design; modeling; lettering; reading and making of working drawings. M96; N481; So2; V851
Stone-setting	See Jewelry.
Stoves and furnaces	Design. See Metalwork. Census: 23 firms; 1,342 employed, of whom 17 are proprietors and 202 salaried.
Styles, Historic	Architectural orders, decorative styles and historic ornament. Lectures; museum study; adaptation. Necessary for architects and interior decorators and valuable for all designers. C72; C722; C781; M46; N482; N483; P88; So2
Surveying	See Topography.
Tailoring	See Drafting, Garment.
Teaching Art	Normal course in one or more of the phases of the fine, applied, and industrial arts for elementary, secondary, vocational, and trade schools. See also each industry. C69; C722; H89; N483; N485; P88

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- Technical drawing Illustration adapted to a special purpose. See each industry.
- Tempera Opaque water color, much used by designers. N485; W27
- Terracotta Modeling. See Clay-working. N481; S02; V851
- Textiles Design; color; preparation of Jacquard cards; engraving of blocks for printing. Adaptation of design for carpets and rugs, cotton and woolen goods, linen (none manufactured in the United States), wide silks and ribbons, lace curtains and yard lace, braids, embroidery, tapestry, etc. Design: C722; C781; N481; N482; N483; P88
- Tinsmithing See Sheet-metal.
- Tools Reading and making working drawings; mechanical drafting; pattern and mold making. C791; H35; P882
- Topography Mechanical drawing adapted to surveying. C69; C782; M46; P76
- Toys and games See analysis of Novelties. Census: 59 firms; 1,284 employed, of whom 61 are proprietors and 128 salaried.
- Tracing See Working drawings.
- Trunks and bags See Leather.
- Turning See Woodworking.
- Typefounding Design; lettering. See Printing. Census: 23 typefounders and makers of printers' materials; 260 employed, of whom 17 are proprietors and 54 salaried. H67
- Typography Design as applied to printing. See Graphic arts and Printing.
- Umbrellas See Parasols.
- Upholstery Design; color; working drawings; sewing; knowledge of textiles including braid, cord, and fringe. See Interior decorating.
- Vise-work Freehand and mechanical drawing; modeling. See Metalwork. P76

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Wagons	See Automobiles.	T22
Wall-paper	Design; color; engraving of the blocks; printing. Census: 7 firms; 811 employed, of whom 2 are proprietors and 143 salaried.	Design: C722; N481; N482; N483
Watches	Engraving for cases. See Clocks.	
Water-color painting	Special technique used for easel pictures and for novelties.	
Weaving, Hand	Design; color; dyeing; technical process.	B79; C722; P88
Wigs	Color.	
Window dressing	Design; color. See Design, Commercial, and Salesmanship.	
Woodcarving	See Carving.	
Woodworking	Reading and making of working drawings; modeling for turners and pattern makers; color for staining. See Cabinet making, Carpentry, Furniture, Joinery. Census: 82 firms devoted to wood turning and carving; 1,012 employed, of whom 104 are proprietors and 80 salaried.	B26; B791; C722; H35; I17; M96; M961; P96h; V851
Working drawings	Reading of working drawings, which are usually blue-prints, is necessary for every mechanic; making of these drawings is also frequently required. See Drafting, Mechanical.	B26; B791; C78; C782; H35; M46; M96; M961; N484; P76; P882; Y8a
Writing, Art	See Criticism, Art.	

ANALYSES OF INDUSTRIES

ARCHITECTURE

THE architect prepares the design and working drawings for buildings and superintends the construction in accordance with his design. An architectural firm is usually composed of several members, some specializing in design and others devoting their attention to the more scientific and practical side; a staff, which may include superintendents of different departments such as construction, engineering, landscape gardening, estimates and specifications, and a number of draftsmen. The work of the architect is exacting and his responsibilities are very great; on the other hand, it is a profession of the highest standing and there are opportunities for advancement.

The designer studies and determines the salient features of the exterior and interior plans. A course of from two to six years in an architectural school gives training which leads first to the place of assistant in an architect's office, then to a responsible position or the establishment of independent offices. The preparation requires much work in exterior and interior design involving architectural drafting and rendering; freehand drawing and color work; modeling; mathematics and strength of materials; and history of all the arts. A liberal education is of the greatest value. The earnings of the practising architect are variable and may range from \$1,000 to \$10,000 a year, while a few prominent firms make more. The minimum fee, named as professional by the American Institute of Architects, is 6 per cent of the total cost of the building.

Architectural construction is closely allied to engineering. It requires knowledge of materials, ability to prepare specifications, and the power of handling men. The superintendent of construction is sometimes merely a capable draftsman with thorough familiarity with the building trades. Such a man receives from \$1,500 to \$2,500 a year.

The largest number of men are employed as draftsmen. This work requires mechanical and freehand drawing, preparation of plans and innumerable detailed drawings, lettering, etc. A boy of 14 may find a place as errand boy in an architect's office at \$3 to \$6 a week and if he shows an interest will be permitted to make tracings and gradually advance. His rise will be much more rapid, however, if he takes a course of one to two years in one of the schools or ateliers that teach architectural drafting, or at least attends the evening classes, of which there are many in New York. The average pay for a good draftsman is \$15 to \$30 a week and occasionally \$50.

A young man entering any of the building trades needs an elementary knowledge of drawing and the training received in the drafting room quickens his reasoning powers and enables him to work with greater accuracy. It is absolutely necessary that all mechanics should be able to read working drawings used in their respective trades, and to make them

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as occasion requires. A practical method of teaching how to make working drawings is developed at the Baron de Hirsch Trade School. The latter part of the term is devoted to work on house plans. Plans of a building are made by all departments. After the bricklayers, masons, and carpenters have done their part, the plumbers add the plumbing details; the electricians, the location of lights; the engineers, the location of radiators for steam or hot water heating; and the sheet-metal workers, the location of furnace pipes, or those for a ventilating system.

COSTUME DESIGN

ALL clothing for men, women, and children from hats down to shoes requires first a designer, then a draftsman, and next a cutter before the actual sewing is begun. "Designing is the one phase that calls for individual ability and originality. To be a successful designer a man or woman must be quick to see the trend of fashions, clever in adapting new ideas, and skilled in combining materials and colors. The designer seldom does the sewing but has a sample operator, a draper, and sometimes a finisher to carry out the work planned. Designing is distinctly an art and to succeed there must be talent for good line in garments combined with practical application. The worker who becomes a designer brings a knowledge of the construction of a garment that is a very valuable asset.

"Cutting is done exclusively by men. For this work there is a greater amount of technical knowledge required than for any other branch of the trade. The work of cutting has four divisions: pattern making, pattern grading, cloth marking, and cloth cutting. The first two of these occupations require substantial knowledge of drafting which has a distinct scientific foundation. In some shops the four classes of workers are used; but in small establishments the pattern maker frequently does his own grading and the marker does the cutting."¹

COSTUME ILLUSTRATION

COSTUME illustration² is a phase of commercial art that offers many opportunities to capable workers, both men and women. The preparation requires much drawing, both from the nude and from the draped model, and great technical ability in the reproduction of textures and the handling of the different media—pen-and-ink, wash, and color.

There are several distinct branches of the work. Costume sketching, which consists simply of copying the object seen, is much in demand by dressmakers during the six weeks of the spring and of the autumn season for securing notes of imported gowns. Similar sketches made, how-

¹ A Study of the Dress and Waist Industry for the Purpose of Industrial Education, by Cleo Murtland, with the collaboration of C. A. Prosser. U. S. Department of Labor, 1914.

² Based upon the investigation made by the Alliance Employment Bureau in 1913.

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ever, under the direction of the designer, are used to show to customers and as models in the workroom.

Costume illustrations are made to be reproduced for advertising purposes in the fashion magazines which sell patterns; the fashion publications for the wholesale trade; the catalogues issued by mail order houses and department stores; booklets for wholesale cloak and suit houses, tailors, and dressmakers; pages for the magazines; street car advertisements; show cards for window display, etc. For this kind of costume illustration there are large studios with many workers, most of whom until recently have been men. The various steps in the process are usually done by different workers. The "layout," or first sketch, is the work that pays best. The next artist takes the drawing and sketches the garments on the figure or figures, and sees that buttons, braid, pockets, etc., are properly placed; the drawing is now given to the next worker to "wash in" the garment and work up details; next, it passes to the artist whose specialties are heads and hats; and probably another puts in the hands, shoes, and background. It is said that there are only six men in the United States who can draw shoes well.

Costume sketching is usually paid for by the piece from 50 cents to \$5 each; when on salary, it is about \$8 to \$15 a week. Salaries for illustrators are usually \$10 to \$35, the layout men often getting more. Occasionally the pay is \$3 to \$5 a figure and the rapid workers can then increase their earnings. Expert work on tailors' ware pays best, \$30 to \$60 a figure, and one illustrator is known to have received \$1,000 for a full page.

Schools are noted in the chapter on Industries; in addition, some firms take apprentices at small wages or without pay for a month or two.

APPLIED DESIGN

DESIGN for textiles, for wall-paper, for oilcloth, etc., must always be adapted to the material and to the special conditions that surround the specific industry. The following details of the requisites in a design for wall-paper will give an idea of the many limitations in each line:

"The designer must not only understand design, but he must know how to produce effects which the design alone does not show. This by the aid of either hand or machine. He must also show much ingenuity in making designs in parts or fractions which may be joined together by the decorator to form panels which may fit in almost anywhere in his scheme of decoration.

"The limitations of a design are these. It can only be either 18 or 20 inches wide and from 12 to 24 inches long; must match at top, bottom, and sides; must have only twelve colors or less. Each color must be well defined, as each color means a print roller. Twelve colors mean twelve rollers.

"After the design is finished, there must be considered the manner in which the best results may be obtained in the printing, in what class or grade of goods it shall be placed, or how it will lend itself for particular color effects. . . . Among the various methods are the engraved roller

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process, the air-brush, hand brushed by the aid of stencils, and the flat block process of printing used for the highest grade of paper. In this last process there is no limit to the number of colors that can be used and the design can be of unlimited size."¹

COMMERCIAL DESIGN

COMMERCIAL advertising branches out into many lines from the designing of a label or letter head to preparing copy for a full-page advertisement in a high class periodical. From the last the step is so short to pictorial illustration that it is not surprising to find that some well-known illustrators are employed at high salaries to do commercial advertising. Many publishers have a large staff and train their workers. One firm requires its apprentices to stay two years and during that time the boy must study drawing at some evening school and in addition a model is posed for the staff from time to time merely as practice. These apprentices begin at \$6 to \$10 a week and rise gradually to about \$25 to \$40; a few commercial designers earn regular salaries as high as \$200 a week. There are many free lances whose work is bought at good figures.

The process through which the copy passes has already been described under Costume Illustration. There is this difference, however, in much of the commercial design, in that text forms an important part of the design and either its lettering by hand or the selection and arrangement of type are very important. The work requires not only artistic and technical ability but originality, judgment, knowledge of printing and engraving, and insight into the philosophy of selling. The making of posters is a branch of commercial design that requires all these qualities and in addition a special power of working in a broad and simple manner so as to carry the message.

Closely allied to commercial design and yet not generally included in it is sign-painting.² For this work lettering—formation and spacing—is of the first importance. When a certain "style" has been secured in lettering, it can be adapted to many uses. Facility must be acquired in lettering in one, two, or more colors, shading, blocking and lining, smalting, gilding on wood and on glass, and lettering on muslin. Theory of color, chemistry of paints, use of japans and dryers, enameling, and other technical subjects are important.

The design for the large outdoor billboards is made in the studio as a layout. The man who does the actual painting out of doors must know how to prepare old and new boards, make the enlarged drawing direct on the board, and mix and apply his colors in accordance with the sketch. Smaller signs are made in the shop.

Show-card writing requires a special technique. A show-card writer

¹ Extracts from Commercial Value of Art in Wall-paper Designing, an address by Charles Booz, designer of wall-paper, delivered at the annual meeting of the Eastern Arts Association, Buffalo, 1915.

² Adapted from the Baron de Hirsch Trade School.

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is usually included on the salaried staff of a large department store, while independent workers often have a group of customers to whom they go a definite number of times a week.

INTERIOR DECORATING

THE interior decorator used to be considered merely the man who painted the inside walls of a building. In recent years the term has broadened until now the interior decorator is the man or woman who plans all the interior furnishings and decorations, including not only the walls but furniture, rugs, lighting fixtures, etc., and superintends the execution of the work. The training necessary is closely related to that of architecture, but special stress is laid on drawing of interiors, design and color as related to room arrangement, and detailed drawings for furniture, draperies, etc. Familiarity with historic styles is necessary. A knowledge of materials, their cost, and where to purchase them is required for estimating. The interior decorator must know how to handle workmen and how to have the work completed on time.

Among the most important workmen employed by the interior decorator are the house painter, wood finisher, paper hanger, cabinet maker, and decorative painter. Each of these lines has become largely a trade of itself. The specialist finds it difficult to remain continually employed at his line of work, and the man with a working knowledge of all branches of the trade has many more opportunities to find employment than the specialist. Wages are from 50 to 90 cents an hour with an eight-hour day. The skill required ranges about as listed above, the decorative painter requiring the most skill and taste. He must have a knowledge of color harmony, be able to mix the proper colors, and to carry out the interior decorator's ideas.

METALWORK

IN metalwork is included one of the largest classes of mechanics and one of the most important. The variety and extent of the metal trades are apparent from the fact that they include the most delicate jewelry at one extreme and steam engines and structural iron at the other with innumerable grades between. In all there are certain underlying principles which are similar and even the processes have the same characteristics. Design and drafting are the groundwork of all and it is with these that we are most concerned.

Only two phases of metalwork are treated here, jewelry and bronze founding.

The success of the jeweler, the silversmith, the goldsmith, depends greatly upon the design. This is first made as a rough sketch and then carefully worked out for the approval of the customer. Detailed working drawings are made and from these there is built up in wax the model of the piece. The framework of gold, silver, or platinum is made from

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the wax model by skilled craftsmen or craftswomen and as each part of the design is hammered, filed, or wrought into shape it is soldered to the frame; enameling is then applied or precious or semi-precious jewels are set in their proper place; the finishers burnish and polish the metals. The various processes used, all requiring more or less ability to draw, are hammering, soldering, etching, repoussé, coloring, enameling, engraving, chasing, casting, and setting of stones. Cheap jewelry, including badges, is cut out and embossed by machinery, but even for these there must be an original drawing and a pattern made chiefly by hand.

"The work of the bronze founder¹ consists of making reproductions in bronze by pouring the molten metal into a sand mold. The metal is an alloy, usually consisting of 90 parts copper, 7 parts zinc, and 3 parts tin. The molding sand is a natural combination of sand and clay.

"The work is divided into several departments: drafting, where the full-size working drawings are made; pattern making in wood, plaster, or metal; molding, which includes several grades of work, the highest being the statuary molding; chasing and filing; fitting, which is the work of fitting and joining completed parts together by soldering, riveting, etc.; and the finishing and coloring, all of which require highly trained workers.

"In the case of monumental sculpture, the artist makes his model in modeling clay, full size or to a certain scale which is afterward enlarged. A plaster cast is obtained from the clay model and this is the pattern around which the bronze molder packs his molding "sand" in small "blocks" or sections which are afterward baked. The original model is removed and a sand "core" prepared, which is suspended in the mold, leaving a space of from $\frac{1}{4}$ in. to $\frac{3}{8}$ in. between the inner sand core and the mold.

"The molten bronze which fills this space when cooled forms the bronze cast. The outer sand is removed and the inner core dug out. The casting is then finished by chasing and the surface is treated chemically to give the desired color or patine."

NOVELTIES

UNDER this head are classed numerous objects, usually small, which vary with the seasons and the fashions but all require some form of decoration. Novelty painting, as such, is not taught in any school, but design and decorative painting in water colors, which are taught in the high schools and in most of the art schools, give the foundation so that the technical trade processes can be acquired in a few days.

The air-brush² or spray has taken the place of handwork for much decorative painting of fans, furniture, glassware, picture frames, calendars, postcards, fashion plates, photographs, etc. The air-brush is connected by a rubber tube with a compressed air tank; to each air-brush

¹ Condensed from *The Art of the Bronze Founder*, by William Donald Mitchell.

² Investigations made by Alliance Employment Bureau.

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there is attached a small tin cup which holds the color to be used; any tint or shade of this color may be secured by manipulating a valve which increases or reduces the flow of color. The color is applied through stencils, half a dozen or more being used for a single design; when coloring photographs the air-brush is often used freehand. Salaries \$6 to \$15 a week; piece-workers earn up to \$15 a week. Work, 44 to 50 hours a week; busy season June to January. Work is mechanical but requires neatness, good judgment, and some mechanical ability, as well as a knowledge of drawing and color. There is no school where the work is taught; some firms take beginners at low wages and there are experienced operators who have their own air-brush and give private lessons. Girls are employed for the lighter objects; boys chiefly on metal bedsteads, etc., and in retouching photographs for engraving.

Boxes,¹ paper and fancy, are decorated with opaque water colors. Designers are well paid, some of them being free lances; decorators, chiefly girls, get \$6 to \$15 a week; busiest season is July to December.

Cards¹—greeting, dinner, score, and postal—also calendars and menus, are usually designed by free lances, printed by the thousand, and then colored by hand. The work is generally done through stencils either by hand or with the air-brush. Colorists, usually women, earn \$5 to \$12; designers and letterers, more frequently men, get \$10 to \$20; piece work paid for at the rate of 20 to 30 cents a hundred and several hundred can be done in a day. When a designer is employed regularly, it is usually a man who also does lettering; \$10 to \$20 a week.

Celluloid objects² are decorated by painting with oil and white enamel directly on the article without drawing or stamping; the design is usually floral and must be followed accurately in the half dozen or more pieces which form a toilet set. The designer, usually a man, gets about \$20 to \$30; forewoman from \$18 to \$25; decorating is done by girls who are usually paid by the piece and earn from \$8 to \$18 a week. Slack season January, February, and June.

Dolls¹ are usually painted by men who can do a hundred faces or more a day. The air-brush is used for hair and cheeks, while eyes, mouth, and nails are done by hand; an expert who paints eyes can make as much as \$60 a week.

Fans¹ are painted on paper or bolting-cloth with sticks of wood or celluloid. One cent is paid for decorating a fan which sells for 25 cents; 50 cents is allowed for the decoration of a 75-cent fan.

Furniture¹ and smaller wooden objects, such as trays, baskets, frames, etc., painted and decorated, are much in favor at present. The work requires accurate drawing, knowledge of design (historic periods for furniture), and a good color sense. Designers are well paid; decorators, boys and girls, about \$7 to \$20 a week.

Lamp shades¹ are of many kinds. The making of the frames is a distinct business, done entirely by men; designers are well paid; painting on textiles and paper is done either in a shop or at home; much of the

¹ Investigations made by the art department of the Washington Irving High School.

² Investigations made by Alliance Employment Bureau.

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work is done outside by women of long experience, the material being furnished by the firm, and some make as much as \$40 a week during the busy season; the average shop hand gets \$8 to \$20.

Ribbon and satin articles, such as infants' accessories,¹ are painted with water colors mixed with opaque white; the design is sometimes stamped, but more frequently the work is freehand. The work is done by girls who earn from \$8 to \$18; an art training is valuable and it is well to know pasting, tying bows, and hand sewing.

Toys, games, and favors² give opportunities for original designers, many of whom earn from \$25 to \$35 a week. In the shops a boy usually lays the flat color and varnish; women do the light mechanical work at \$5 to \$15 a week, and men do the more important parts at about \$20 a week; piece work is paid for at about 5 cents for a face, 20 cents for a larger face and hands, etc. Busiest time is July to December.

¹ Investigations made by Alliance Employment Bureau.

² Investigations made by the art department of the Washington Irving High School.

SCHOOLS GIVING INSTRUCTION
IN THE FINE ARTS OR IN
THE INDUSTRIAL ARTS

(When tuition is free, or the cost nominal, the fact is noted; in all other cases fees can be ascertained by communicating with the schools.)

- A77 ART STUDENTS' LEAGUE, 215 West 57th Street, Manhattan.
Painting (portrait, life, miniature, landscape, still life, mural) ; modeling; illustration; etching; posters; anatomy; composition. Day and evening classes; winter and summer sessions; special summer class for beginners under 16 years of age. Governed by Board of Control.
- B26 BARON DE HIRSCH TRADE SCHOOL, 222 East 64th Street, Manhattan.
House painting; sign painting; reading and making of working drawings for printers, plumbers, electricians, operating engineers, sheet metal workers, wood workers, and machine workers. Tuition free; applicants must be Jews, at least 16 years of age; day classes. J. Ernest G. Yalden, superintendent.
- B63 BOARD OF EDUCATION, Lecture Bureau, 500 Park Avenue, Manhattan.
Courses given in the evening for adults, include many lectures on art. Henry M. Leipziger, supervisor. For schools see Public Schools.
- B71 BOYS' CLUB, 161 Avenue A (10th Street), Manhattan.
Painting (oil, water color, pastel); modeling. Afternoon classes five days a week, October to May. Two years of work necessary to compete for scholarships to the School of the National Academy of Design. Nora C. McKiniry, director.
- B79 BROOKLYN INSTITUTE OF ARTS AND SCIENCES, Department of Education, 30 Lafayette Avenue, Brooklyn.
Photography; lecture courses on appreciation of art; weaving; crafts. Afternoon and evening sessions. Charles D. Atkins, director.
- B791 BROOKLYN VOCATIONAL SCHOOL FOR BOYS, Nassau and Jay Streets, Brooklyn.
Architectural drawing; mechanical drawing, including free-hand sketching, finished working drawings, and elementary per-

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spective; making and reading blue-prints; garment drafting; drafting for joinery, cabinet making, carpentry, machine shop, tool and die making, sheet-metal work, electrical work, and printing. Tuition free; open to boys over 14 years of age who have graduated from elementary school; hours 9 A.M. to 5 P.M. throughout the year except August; 4 hours a week of drawing and 16 hours of academic subjects to 15 hours of shop work; two-year course for graduation. Maintained by the Board of Education; George J. Loewy, principal.

C43 CHILDREN'S AID SOCIETY, 105 East 22d Street, Manhattan.

Evening schools under the auspices of the Society have industrial classes open to students of 14 years and over. Classes in day schools are for children from the kindergarten through 4B.

- (a) Fifty-third Street School, 552 West 53d Street, Manhattan. Embroidery and dressmaking for girls; carpentry for boys.
- (b) Henrietta School, 224 West 63d Street, Manhattan. Dressmaking; millinery; sewing.
- (c) Italian School, 154 Hester Street, Manhattan. Dressmaking, millinery, hand and power machine embroidery for girls; printing and sign-painting for boys.
- (d) Jones Memorial School, 407 East 73d Street, Manhattan. Dressmaking; millinery; embroidery; sewing.
- (e) Rhinelander School, 350 East 88th Street, Manhattan. Jewelry for boys and trade embroidery for girls. Classes limited to crippled children, at least 16 years of age, who have gone through the 6B grade of the elementary schools. Two-year course which enables the student to become self-supporting; they can remain in the school to execute orders and can earn an average of \$20 a week.
- (f) Sixth Street School, 630 East 6th Street, Manhattan. Dressmaking, millinery, and embroidery for girls; carpentry for boys.
- (g) Tompkins Square School, 395 East 8th Street, Manhattan. Dressmaking, millinery, plain and power sewing for girls; sign-painting for boys.

C54 CLARA DE HIRSCH HOME FOR GIRLS, 225 East 63d Street, Manhattan.

Dressmaking; millinery; hand and machine sewing. Courses of 5 to 13 months for girls 14 to 17 years of age; 40 free scholarships for residents, small fee for those who can afford it.

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C69 COLLEGE OF THE CITY OF NEW YORK, Art Department, Convent Avenue and 139th Street, Manhattan.

Freehand, architectural, mechanical, and topographical drawing; design; elementary architectural design; descriptive geometry; aesthetics. Day and evening classes, September to June. Frederick Dielman, professor in charge.

Extension courses for teachers include aesthetics, object drawing, woodwork, metalwork. Stephen P. Duggan, director.

C72 COLUMBIA UNIVERSITY, School of Architecture, West 116th Street, Manhattan.

Architectural design; architectural engineering. Six-year course leads to degree of Bachelor in Architecture; also short courses. Day and evening classes; winter, summer, and extension sessions. Richard F. Bach, curator.

C721 COLUMBIA UNIVERSITY, School of Mines, Engineering, and Chemistry, West 116th Street, Manhattan.

Drafting for mining, metallurgical, civil, sanitary, electrical, mechanical, and chemical engineers. Day, evening, extension, and summer courses. Frederick A. Goetze, dean of Faculty of Applied Science.

C722 COLUMBIA UNIVERSITY, Teachers College, School of Practical Arts, 525 West 120th Street, Manhattan. Maurice A. Bigelow, director.

(a) Fine Arts. Drawing and painting; design in the art industries; house design and decoration; costume design and illustration; fine arts education. Four-year course leads to bachelor's degree; also short courses. Day and extension classes; winter and summer sessions. Arthur W. Dow, director.

(b) Household Arts. Textiles and clothing (including dress-making, millinery, and embroidery); household arts education. Helen Kinne, director.

(c) Industrial Arts. Industrial drawing and design; metal working; wood working; industrial arts education. Frederick G. Bonser, director.

COOPER UNION FOR THE ADVANCEMENT OF SCIENCE AND ART,
Third Avenue and 8th Street, Manhattan. Charles R. Richards, director.

C78 COOPER UNION FREE NIGHT SCHOOL OF ART FOR MEN.

Architectural and freehand drawing; modeling; decorative design. Tuition free; eight months' session. Frederick Dielman, art director.

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C781 COOPER UNION, Woman's Art School.

Painting; decorative design; modeling; costume design and costume illustration; interior decoration; lectures on history of art, anatomy, perspective, and composition. Tuition free; day classes for eight months. Frederick Dielman, art director; Kate L. Reynolds, principal.

C82 COOPER UNION FREE SCHOOL OF TECHNICAL SCIENCE FOR MEN AND WOMEN.

Drafting for civil, mechanical, and electrical engineers includes working drawings, topography, and machine design and drafting. Tuition free; applicants must be at least 16 years of age; day school four-year course leads to bachelor's degree; evening school three-year course in mechanical drawing and five-year course in engineering lead to diploma; seven months' session. Charles R. Richards, director.

C86 CRIPPLED CHILDREN'S EAST SIDE FREE SCHOOL, 157 Henry Street, Manhattan.

Embroidery for girls; box-making for boys. Academic instruction under Board of Education; manual training by teachers employed by the Society, from the kindergarten age up. Workrooms maintained where adult cripples are employed at wages varying from \$2.50 to \$15 a week.

E12 ELECTRICAL SCHOOL, THE NEW YORK, 39 West 17th Street, Manhattan.

Drafting for electrical trades. Day and evening classes for men and boys over 15.

E13 ETHICAL CULTURE ART HIGH SCHOOL, Central Park West and 63d Street, Manhattan.

Pre-vocational instruction in pottery and bookbinding with academic work related to the arts. Irene Weir, director of art.

F87 FREE INDUSTRIAL SCHOOL FOR CRIPPLED CHILDREN, 471 West 57th Street, Manhattan.

Painting; woodcarving; tooled leatherwork; brass and copper hammering; sewing; dressmaking. For crippled children without regard to color, creed, or race.

G85 GREENWICH HOUSE SETTLEMENT, 26 Jones Street, Manhattan.

Pottery; carpentry. Afternoon and evening classes; fees 2 cents a lesson for children, 5 cents for adults. Maude Robinson, art director.

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H35 HEBREW TECHNICAL INSTITUTE, 36 Stuyvesant Street, Manhattan.

Freehand, mechanical, and architectural drawing; shop work in joinery, woodcarving, turning, pattern making, metalwork, and machine work; shop lectures; academic studies. Tuition, tools, and books free; candidates must be residents of New York City and at least twelve and a half years of age; three-year course leads to a diploma; full day sessions in winter, half days in summer. Edgar S. Barney, principal.

Evening School for machinists and men in pattern and cabinet making shops, over 19 years of age, without regard to religious faith. Classes three evenings a week; tuition free, but students furnish their own materials and tools; two-year course.

H351 HEBREW TECHNICAL SCHOOL FOR GIRLS, 240 Second Avenue (15th Street), Manhattan.

Dressmaking; millinery; embroidery; costume design; academic studies. Tuition free; day sessions throughout the year; candidates must be at least fourteen and a half years of age. Mary E. Dolphin, principal.

HENRY STREET SETTLEMENT, 265 Henry Street, Manhattan. See N31.

H67 HOE & CO. APPRENTICE SCHOOL, 504 Grand Street, Manhattan.

Mechanical drawing for machinists, pattern makers, saw-smiths, and molders. Four-year course for boys over 16, directly related to work in the shop. Tuition free. Richard H. Wright, supervisor. Maintained in coöperation with the Board of Education.

H89 HUNTER COLLEGE, Department of Art History and Drawing, Lexington Avenue, 67th and 68th Streets, Manhattan.

History and principles of art; practical work in drawing, painting, and design. Courses planned for one to four years in art appreciation as foundation for specialization and for grade teachers. Applicants must be girls resident in New York City and must have had four years of high school or the equivalent. M. Christine W. Reid, head of department.

In7 INSTITUTE FOR IMPROVED INSTRUCTION OF DEAF MUTES, 904 Lexington Avenue, 66th and 67th Streets, Manhattan.

Drawing; dressmaking; millinery; embroidery; woodworking. Post-graduate courses. Numerous free scholarships maintained.

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M31 MANHATTAN TRADE SCHOOL FOR GIRLS, 209 East 23d Street, Manhattan.

Dressmaking; millinery; pasting trades. Tuition free; day sessions throughout the year except August; graduation after 200 days; certificate given after three months at trade with satisfactory report from employer. Three weeks' test course. Maintained by the Board of Education; Florence M. Marshall, principal.

M46 MECHANICS INSTITUTE, 20 West 44th Street, Manhattan.

Freehand, architectural, and mechanical drawing; architectural design; carriage and automobile drafting (also day); decorative design; modeling; applied mathematics, mechanics, and electricity. Tuition free to males employed during the day; each class meets two evenings a week, September to April; three-year course for diploma. Louis Rouillion, director.

M56 METROPOLITAN MUSEUM OF ART, Fifth Avenue at 82d Street, Manhattan.

Lectures on art. Services of instructor free for public school pupils and teachers.

M72 MODERN ART SCHOOL, 72 Washington Square South, Manhattan.

Painting (oil, water color, mural); sculpture; design; costume illustration; posters; interior decoration; pottery. Day, evening, and Sunday classes; sessions throughout the year. Fred-eric Burt and Myra Musselman-Carr, directors.

M96 MURRAY HILL EVENING TRADE SCHOOL, 237 East 37th Street, Manhattan.

Mechanical and architectural drawing; plan reading and estimating; drawing for marble workers; sign painting and show-card writing; lithographic transferring; drafting for tailors. Tuition free; open to boys over 14 who do not attend a day school and to men employed in a trade; each class meets two evenings a week; certificate given for one year's work; graduation in from two to four years. Maintained by the Board of Education; Morris E. Siegel, principal.

M96I MURRAY HILL VOCATIONAL SCHOOL, 237 East 37th Street, Manhattan.

Architectural drawing; mechanical drawing, including free-hand sketching, finished working drawings, and elementary perspective; making and reading blue-prints; sign painting; display and show-card writing; drafting for joinery, cabinet making, carpentry, plumbing and gas fitting, electrical work,

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and printing. Tuition free; open to boys over 14 years of age who have graduated from an elementary school; hours, 9 A.M. to 5 P.M. throughout the year, except August; 4 hours a week of drawing and 16 hours of academic subjects with 15 hours of shop work. Two-year course for graduation. Maintained by the Board of Education; George J. Loewy, principal.

N21 NATIONAL ACADEMY OF DESIGN, Amsterdam Avenue and 109th Street, Manhattan.

Drawing from antique and life; painting (life, portrait, and landscape); sculpture; etching; composition; perspective; anatomy. Day and evening classes; summer courses; entrance fee \$10, balance of tuition free. Governed by the Council of the Academy, Adolph A. Weinman, chairman. School maintained only for those who intend to follow art as a profession; applicants over 30 years of age not admitted.

N31 NEIGHBORHOOD PLAYHOUSE of the Henry Street Settlement, 466 Grand Street, Manhattan.

Stage design and decoration; designing, stenciling, and lettering for posters and for costume illustration; elementary drawing and design. Tuition free. The advanced classes for girls and boys over 14 may lead directly to scene painting and allied trades; elementary for children 7 to 14 years. All work is related to the dramatic productions at the Playhouse.

N481 NEW YORK EVENING SCHOOL OF INDUSTRIAL ART, 204-214 East 42d Street, Manhattan.

Book illustration; costume illustration; interior decoration; jewelry design; mural decoration; poster and advertising design; textile design; stained-glass design; principles of design; modeling; sculpture; drawing from life; metalwork. Tuition free; certificate at end of one year; diploma after three years. Applicants must have had preliminary training and be employed during the day, although not necessarily in trade studied; open to men and women four nights a week, September to April; each class meets two nights a week. Maintained by the Board of Education; George K. Gombarts, director.

N482 NEW YORK SCHOOL OF APPLIED DESIGN FOR WOMEN, 160 Lexington Avenue (30th Street), Manhattan.

Design for wall-paper, textiles, book covers; illustration; fashion illustration; interior decoration; architecture; historic ornament. Applicants must be at least 16 years of age and should preferably have two years of high school training or equivalent; day classes seven and a half months; summer two months, three mornings a week. Ellen J. Pond, superintendent.

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N483 NEW YORK SCHOOL OF FINE AND APPLIED ART, 2237 Broadway (80th Street), Manhattan.

Costume design and illustration; interior decoration and furnishing; illustrative advertising; poster and layout; freehand and mechanical drawing; painting; illustration; design; craft classes in metal, clay, leather, basketry, porcelain decoration; normal training, including Saturday classes for teachers; Saturday classes for children; lectures on history of art for the school and public. Day classes September to May; summer at Belle Terre, Long Island, N. Y. Certificate at end of one year; graduation in two or three years. Frank Alvah Parsons, president; Susan F. Bissell, secretary.

N484 NEW YORK TRADE SCHOOL, First Avenue, 67th and 68th Streets, Manhattan.

House painting and decorating; sign painting; mechanical and plan drawing; reading and making of blue-prints for bricklaying, plumbing, electrical work, wood and sheet metal patterns, blacksmithing, printing, cornice and skylight work, and steam and hot-water fitting. Day and evening sessions September to March; open to beginners as well as to young men already in the trades; certificate upon completion of course, which is usually one term of four months in day classes or three terms in evening. Students' dormitory for young men who come from a distance. H. V. Brill, superintendent.

N485 NEW YORK UNIVERSITY, University Heights, Bronx.

Advanced training for teachers in design and methods given at University Heights, Summer School only; James P. Haney, director.

Evening and Saturday morning courses in winter at Washington Irving High School in dressmaking, millinery, embroidery, drafting, costume design, basketry, cord, and raffia work for supervisory teachers of domestic art and for teachers in trade schools and ungraded classes.

P37 PENELOPE'S, 13 West 39th Street, Manhattan.

Hand sewing and embroidery. Tuition free; 6 weeks on trial for girls between 14 and 18, and if aptitude is shown 18 months' course may be taken. Workroom maintained. Miss A. F. Riorden, director.

P76 POLYTECHNIC INSTITUTE, College of Engineering, Livingston and Court Streets, Brooklyn.

Mechanical drawing in courses for chemical, civil, electrical, and mechanical engineers. Day, afternoon, and evening courses. Fred W. Atkinson, president.

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P88 PRATT INSTITUTE, School of Fine and Applied Arts, Ryerson Street, Brooklyn.

General art and pictorial illustration; costume and commercial illustration; applied design and interior decoration; design and practical work in jewelry, silversmithing, basketry, pottery, bookbinding, wood carving, and tooled leather; architectural construction and architectural design; normal art and manual training. Classes in freehand drawing, life and portrait drawing, painting, modeling, commercial illustration, ornament, design, architectural drawing. Day and evening classes September to June; men and women applicants for normal courses must be at least 19 years of age, in other day classes 17, and in evening classes 14. Walter S. Perry, director.

P881 PRATT INSTITUTE, School of Household Science and Arts.

Trade dressmaking and millinery; design and pattern drafting, including hat frames; costume drawing; normal course. Day and evening classes; applicants must be at least 17 years of age; men as well as women are admitted to the design, illustration, and drafting courses; certificates granted after nine months of classroom work and three months of workroom practice. Isabel E. Lord, director.

P882 PRATT INSTITUTE, School of Science and Technology.

Steam and machine design; drafting for applied electricity, chemistry, leather chemistry and tanning, carpentry and building. Two-year day industrial and one-year day trade courses; evening trade and technical courses; applicants should be at least 17 years of age. Evening courses for trade teaching open only to workmen with at least five years' experience of journeymen grade, preferably between 25 and 35 years of age. Samuel S. Edmands, director.

PUBLIC COLLEGES.

College of the City of New York (see C69).
Hunter College (see H89).

P96 PUBLIC DAY HIGH SCHOOLS (24), conducted by the Board of Education, 500 Park Avenue, Manhattan.

Elementary design required in the first high school year, representative drawing in the second year, and also in the third year for all candidates for Training School (for other pupils the third-year drawing is optional); advanced elective courses offered in the fourth year with daily work in drawing, home study, and recitations. The nature of these elective courses is determined by the general character of each school (see below). The Washington Irving High School has a two-year profes-

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sional course for girls in commercial design and in costume illustration. James P. Haney, director of drawing.

- (a) Bay Ridge High School, Fourth Avenue and Senator Street, Brooklyn.
Applied design elective in fourth year; girls.
- (b) Boys' High School, Marcy Avenue and Madison Street, Brooklyn.
Mechanical drawing elective in fourth year.
- (c) Bryant High School, Long Island City.
Applied design elective in fourth year; boys and girls.
- (d) De Witt Clinton High School, Tenth Avenue and 59th Street, Manhattan.
Art history and mechanical drawing; elective in fourth year; boys.
- (d¹) Far Rockaway High School, Far Rockaway, L. I.
Applied design elective in fourth year; boys and girls.
- (d²) Girls' High School, Nostrand Avenue near Fulton Street, Brooklyn.
Applied design elective in fourth year.
- (e) High School of Commerce, 155 West 65th Street, Manhattan.
Commercial design elective in fourth year; boys.
- (f) Julia Richman High School, 60 West 13th Street, Manhattan.
Applied design elective in fourth year; girls.
- (f¹) Manual Training High School, 4th Street and Seventh Avenue, Brooklyn.
Applied design elective in fourth year; boys and girls.
- (g) Morris High School, Boston Road and 166th Street, Bronx.
Applied design for girls and mechanical drawing for boys elective in fourth year.
- (h) Stuyvesant High School, 345 East 15th Street, Manhattan.
Technical drawing elective in fourth year; boys.
- (i) Wadleigh High School, 114th Street, near Seventh Avenue, Manhattan.
Interior decoration elective in fourth year; girls.
Washington Irving High School, 40 Irving Place (16th and 17th Streets), Manhattan.
Two-year professional course; girls. (See W27.)

P961 PUBLIC EVENING HIGH SCHOOLS (18), conducted by the Board of Education, 500 Park Avenue, Manhattan.

Architectural, mechanical, and freehand drawing; applied design; advanced dressmaking and millinery; costume design; advertising. Tuition free; sessions two hours a night, four nights a week, one hundred and twenty nights, beginning end of Sep-

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tember; applicant must be graduate of elementary school or have equivalent education. Modeling, jewelry, etc., taught at New York Evening School of Industrial Art, which see; for types of drawing at other schools, see below. Henry E. Jenkins, district superintendent in charge of evening schools.

- (a) Bay Ridge Evening High School; P. S. 140, 60th Street, west of Fourth Avenue, Brooklyn.
Freehand drawing; commercial design; costume illustration; for women.
- (b) Bronx Evening High School; P. S. 40, Prospect Avenue, Jennings Street, and Ritter Place, Bronx.
Freehand drawing; costume illustration; for women.
- (c) Brooklyn Evening High School; Commercial H. S., Albany Avenue and Dean Street, Brooklyn.
Architectural, freehand, and mechanical drawing for men.
- (d) Brooklyn Evening Trade School, Seventh Avenue, between 4th and 5th Streets, Brooklyn.
Architectural and mechanical drawing for men and women.
- (e) Bushwick Evening Trade School; 400 Irving Avenue, Brooklyn.
Architectural, freehand, and mechanical drawing for men and women.
- (f) Central Evening High School; Girls' H. S., Nostrand Avenue and Halsey Street, Brooklyn.
Freehand drawing and costume illustration; for women.
- (g) Curtis Evening High School; St. Mark's Place, New Brighton, Richmond.
Freehand and mechanical drawing for men and women.
- (h) Eastern Evening High School; P. S. 122, Harrison Avenue and Heyward Street, Brooklyn.
Architectural, freehand, and mechanical drawing for men.
- (i) East Side Evening High School for Men; P. S. 20, Rivington and Forsyth Streets, Manhattan.
Mechanical drawing.
- (j) East Side Evening High School for Women; P. S. 62, Essex and Norfolk Streets, Manhattan.
Freehand drawing.
- (k) Harlem Evening High School for Men; P. S. 184, 116th Street, between Lenox and Fifth Avenues, Manhattan.
Architectural, freehand, and mechanical drawing.
- (l) Harlem Evening High School for Women; Wadleigh H. S., West 114th Street, Manhattan.
Freehand drawing; costume illustration.

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- (*m*) Harlem Trade School; 138th and 139th Streets, west of Fifth Avenue, Manhattan.
Architectural and mechanical drawing for men.
- (*n*) Long Island City Evening High School; Wilbur Avenue and Academy Street, Long Island City, Queens.
Architectural and mechanical drawing for men and women.
- (*o*) Morris Evening High School; Morris H. S., 166th Street and Boston Road, Bronx.
Architectural, freehand, and mechanical drawing for men.
- (*p*) Murray Hill Evening Trade School; 237 East 37th Street, Manhattan. (See M96.)
- (*q*) New Lots Evening High School; P. S. 149, Sutter Avenue, Vermont and Wyona Streets, Brooklyn.
Mechanical and architectural drawing; costume illustration; commercial design; for men and women.
- (*r*) New York Evening High School for Men; DeWitt Clinton H. S., Amsterdam Avenue and 59th Street, Manhattan.
Architectural, freehand, and mechanical drawing.
- (*s*) New York Evening High School for Women; Washington Irving H. S., 40 Irving Place, 16th and 17th Streets, Manhattan.
Freehand drawing; applied design; lettering; costume illustration; garment drafting; bookbinding; embroidery.
New York Evening Industrial Art School, 204 East 42d Street, Manhattan. (See N481.)
- (*t*) South Brooklyn Evening High School; P. S. 94, Sixth Avenue, 50th and 51st Streets, Brooklyn.
Architectural, freehand, and mechanical drawing; commercial design; lettering; for men.
- (*u*) Stuyvesant Evening High School, 345 East 15th Street, Manhattan.
Freehand and architectural drawing; industrial design; cabinet making; for men. Costume design and illustration; lettering; life; commercial illustration; for women.
- (*v*) Tottenville Evening Trade School, Academy Place, Tottenville, Richmond.
Clay modeling.
- (*w*) Washington Heights Evening High School, 145th and 146th Streets, west of Amsterdam Avenue, Manhattan.
Architectural, freehand, and mechanical drawing for men and women.

PUBLIC VOCATIONAL SCHOOLS.

Brooklyn Vocational School for boys. (See B791.)

Hoe Apprentice School. (See H67.)

Manhattan Trade School for Girls. (See M31.)

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Murray Hill Evening Trade School. (See M96.)

Murray Hill Vocational School. (See M961.)

New York Evening School of Industrial Art. (See N481.)

Vocational School for Boys. (See V851.)

Washington Irving High School, Art Department. (See W27.)

Sa2 ST. GEORGE EVENING TRADE SCHOOL, 505 East 16th Street, Manhattan.

Sign painting; design; decorative painting. Registration fee, ten cents a month; applicants must be at least 12 years of age; certificate granted after one year, graduation in three years. John McKinley, principal.

Sch6 SCHOOL OF MECHANICAL DENTISTRY, 25 West 45th Street, Manhattan.

Drawing; modeling.

Sch7 SCHOOL FOR PRINTERS' APPRENTICES OF NEW YORK, 436 West 27th Street, Manhattan.

Design as applied to hand composition. Free tuition for boys who have been two years at the trade and who are members of Typographical Union No. 6; afternoon and evening classes. Supported jointly by Employing Printers Section, Typographical Union No. 6, and Hudson Guild. A. L. Blue, director.

Scu6 SCUOLA D'INDUSTRIE ITALIANE, 177 Macdougall Street, Manhattan.

Needlework on linen in style of Italian work of sixteenth and seventeenth centuries. Free tuition for girls over 15; work-room maintained, and as soon as work is salable the girls are paid weekly wages from \$3 up.

So2 SOCIETY OF BEAUX-ARTS ARCHITECTS, 126 East 75th Street, Manhattan.

Architectural design; architectural and decorative sculpture; mural painting. A free atelier for men, maintained jointly by The Society of Beaux-Arts Architects, The National Society of Sculptors, and The Mural Painters; open 9 A.M. to 10 P.M. daily, except Sundays, all the year to any student, architectural draftsman, journeyman, or apprentice painter or modeler, and to all other men interested. The method of instruction consists of monthly problems worked out by the students either in an atelier or at recognized art schools throughout the United States and the work is judged and criticized monthly by professional artists. Fred Godley, director for architectural design; Lloyd Warren, director for sculpture; William N. Taylor, director for mural painting.

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T22 TECHNICAL SCHOOL FOR CARRIAGE DRAFTSMEN AND MECHANICS, 20 West 44th Street, Manhattan.

Freehand, scale, and full-size drawings; geometry applied to carriage, wagon, and automobile construction known as "French Rule" of drafting; complete body drafting; perspective and colored drawing of carriages, wagons, and automobiles for illustration purposes. Applicants must be over 16 years of age and employed in the manufacture of pleasure or business vehicles; day and evening classes; tuition free. School maintained under the auspices of the Carriage Builders' National Association and the Automobile Chamber of Commerce in the Mechanics' Institute of the General Society of Mechanics and Tradesmen. Andrew F. Johnson, instructor-in-chief.

UN3 UNION SETTLEMENT, 237 East 104th Street, Manhattan.

Modeling; needlecrafts; weaving; bookbinding; basketry; pottery. Free afternoon and evening classes for children. Lillian A. Phillips, director of practical arts.

V851 VOCATIONAL SCHOOL FOR BOYS, 138th Street near Fifth Avenue, Manhattan.

Architectural, freehand, and mechanical drawing; trade drawing applied to woodwork, metalwork, plumbing, electrical installation, printing, cornice making, sheet-metal work, and tile laying; modeling for terracotta, stone cutting, metalwork, and die making; photo-engraving and process work; commercial design; sign-painting; show-card writing. Free school maintained by the Board of Education of the city for boys of 14 years and over; open 9 A.M. to 5 P.M. daily, except August. Trade drawing and non-vocational subjects, occupying one-quarter of the time, required; shop equipment; certificate after two years plus six months' successful experience in business. Applicants for evening classes must be 16 years of age, have equivalent of 7 years of elementary school education, and be employed in the trade or related work. Charles J. Pickett, principal.

W27 WASHINGTON IRVING HIGH SCHOOL, 40 Irving Place, 16th and 17th Streets, Manhattan.

Elementary design is required in the first year, just as in all the other high schools, but a professional art course is offered only in this school. Pupils may elect the industrial art course at the end of the first year and follow it through the second and third years, graduating at the close of the third year. During the two years of this professional course 19 periods of 40 minutes each are given each week to art work and 11 periods to academic studies. In the first year of special study the pupil devotes her time to drawing followed by the study of color and design; in the second year she specializes either in (1) Commercial Design, which gives a knowledge of the principles

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of color, design, and reproductive processes as these relate to advertising, and technical instruction in lettering and draftsmanship in various media; or in (2) Costume Illustration, which includes drawing from the figure, layouts, and rendering of textures for reproduction. Edward Cornell Zabriskie, principal.

W38 WEBB'S ACADEMY OF NAVAL ARCHITECTURE AND MARINE ENGINEERING, 188th Street and Sedgwick Avenue, Bronx.

Mechanical drawing 10 hours a week for naval architects and marine engineers. Tuition free; applicants must be between 15 and 21 years of age and have equivalent of high school mathematics; four-year course; academic and shop work. J. Irvin Chaffee, principal.

W58 WHITE SCHOOL OF PHOTOGRAPHY, 230 East 11th Street, Manhattan.

Practical work in photography, appreciation, and design; evening course in photogravure. Applicants must have high school education or equivalent; sessions daily, except Saturday, 9 A.M. to 4 P.M.; evening class once a week; summer session at East Canaan, Conn. Clarence H. White, director.

Y8 YOUNG MEN'S CHRISTIAN ASSOCIATION.

Edward L. Wertheim, director of education.

(a) 215 West 23d Street, Manhattan.

Commercial design; illustration; plan reading for metalwork. Classes formed according to demand. For boys over 12 who are members of the Association; fees nominal.

(b) 318 West 57th Street, Manhattan.

Interior decoration with drawing. Evening course, 2 hours a week.

Y81 YOUNG WOMEN'S CHRISTIAN ASSOCIATION, Lexington Avenue and 53d Street, Manhattan.

Commercial design; costume sketching; decorative design; drawing; painting. School of Household Arts offers drafting and dressmaking; design and pattern making; millinery; embroidery; flower making. Applicants must be at least 16 and have equivalent of two years of high school education; half-day classes and two evenings a week; three-year course; fees nominal. Lucy M. Whenman, director of education.

Y83 YOUNG WOMEN'S HEBREW ASSOCIATION, 31 West 110th Street, Manhattan.

Dressmaking; millinery; embroidery. Day and evening classes; fees nominal.

MUSEUMS

AMERICAN MUSEUM OF NATURAL HISTORY, 77th Street, Columbus Avenue and Central Park West, Manhattan.

Material illustrating the customs and early art of various races—Chinese bronzes, Peruvian textiles, Indian baskets and blankets; gems, etc. Open free, daily 9 A.M. to 5 P.M.; Sunday 1 to 5 P.M.

AMERICAN NUMISMATIC SOCIETY, 156th Street, west of Broadway, Manhattan.

Coins and medals, American and foreign. Museum and library open free, daily 10 A.M. to 5 P.M.; Sunday 1 to 5 P.M.

BARNARD CLOISTERS, Fort Washington Avenue at 191st Street, Manhattan.

Antique sculpture collected by George Grey Barnard, shown in a building of the type of a French Gothic monastery of about the thirteenth century. Open daily 10 A.M. to 5 P.M. Admission, \$1 on week days; 50 cents on Sunday.

BROOKLYN MUSEUM, Eastern Parkway and Washington Avenue, Brooklyn.

Egyptology; architectural photographs; bronzes; modern sculpture; Greek vases and terracottas; ancient glass; pottery; coins and medals; Oriental and European ceramics; jades; lacquers; ivory carvings; furniture; textiles; laces; old and modern paintings; drawings; prints; photographs; lantern slides; library. Also natural history and ethnology. Open daily 9 A.M. to 6 P.M.; Sunday 2 to 6 P.M.; Thursday evening 7.30 to 9.30. Admission free except Monday and Tuesday, when fee is 25 cents; children, 10 cents. Children's Museum, Bedford Park. Open free, daily 9 A.M. to 5 P.M.

COOPER UNION MUSEUM FOR THE ARTS OF DECORATION, Third Avenue and 8th Street, Manhattan.

Furniture, textiles, wood carvings, and other industrial art objects arranged in chronological order; decorative design scrap-books; reference library. Open free, daily, except Sunday and Monday, 9 A.M. to 5 P.M. and 6.30 to 9 P.M.; closed July 1 to September 15.

THE METROPOLITAN MUSEUM OF ART

DYCKMAN HOUSE, PARK AND MUSEUM, 204th Street and Broadway, Manhattan.

Building erected 1783-5; restored and given to the City 1915. Furniture, costumes, and other objects of the eighteenth century; relics dug up near the place. Open free, daily 10 A.M. to 5.30 P.M.

HISPANIC MUSEUM, 156th Street, west of Broadway, Manhattan.

Paintings, sculpture, wood carvings, and other works of Spanish art. Open free, daily, including Sunday, 10 A.M. to 5 P.M.

METROPOLITAN MUSEUM OF ART, Fifth Avenue at 82d Street, Manhattan.

Antiquities from Egypt, Crete, Cyprus, etc.; architectural casts and models; arms and armor; Boscoreale mural paintings; bronzes, old and modern; ceramics, Oriental and European; clocks, watches, and sun-dials; drawings, old and modern; Greek sculpture, terracottas, and vases; enamels; engravings and etchings; furniture of various periods; gems; glass; iron ware; ivory carvings; jade; jewelry; laces; lacquers; manuscripts; miniatures; medals and plaques; musical instruments; ormolu; paintings, old and modern; pewter; pottery and porcelain; rugs; sculpture—classic, Gothic, Renaissance, and modern; silverware; textiles; woodwork—Gothic, Renaissance, French, English, and Colonial. Library, special exhibitions, classrooms, study-rooms, lectures, photographs, lantern slides. Expert guidance by appointment, 25 cents a person with a minimum of \$1 an hour. Open daily 10 A.M. to 6 P.M. in summer, to 5 P.M. in winter; Saturday to 10 P.M.; Sunday 1 to 6 P.M. Admission free except Monday and Friday, when it is 25 cents.

MUSEUM OF FRENCH ART, 599 Fifth Avenue (48th Street), Manhattan.

Reference library, clipping files, current periodicals. Occasional exhibitions and lectures. Open free, daily 3 to 6 P.M.

NEW YORK HISTORICAL SOCIETY, Central Park West and 77th Street, Manhattan.

Important collections of paintings by old masters; Egyptian antiquities; New York prints. Open free, daily, except Sundays and holidays, 9 A.M. to 6 P.M.; holidays, 1 to 5 P.M., except Christmas, New Year's, and July 4th.

NEW YORK PUBLIC LIBRARY, Fifth Avenue and 42d Street, Manhattan.

Lenox and Stuart collections of paintings and objects of art; Avery and other collections of prints (over 75,000); current exhibitions; special art reference library. Open free, daily 9 A.M. to 6 P.M.; Sunday 1 to 5 P.M.

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VAN CORTLANDT HOUSE AND PARK, Kingsbridge (220th Street),
Bronx.

Building erected 1748; acquired by the City 1889. Furniture,
prints, and other objects of the eighteenth century. Open daily
10 A.M. to 5 P.M.; Sunday 2 to 5 P.M. Admission free except
Thursday, when fee is 25 cents.

WASHINGTON HEADQUARTERS ASSOCIATION, Jumel Mansion, 160th
Street and Edgecombe Avenue, Manhattan.

Washington. ? Coloniz' furnitu Revolutionary relics.
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