The ARCHITECT & ENGINEER

JANUARY 1922

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Architects' Specification Index

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ART METAL
Federal Ornamental Iron and Bronze Co., 16th St. and San Bruno Ave., San Francisco.
Meese & Pfeffer Iron Works, 1415 Harrison street, San Francisco.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Trepico Potteries, Inc., Glendale, Cal.

AUTOMATIC SPRINKLERS
Grinnell Co. of the Pacific, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Company, [illegible] Sansome street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

AUTOMOBILES
W. L. Hughson Co., Geary St., at Van Ness Ave., San Francisco.

AWNINGS, TENTS, ETC.
W. A. Plummer, Front, at Pine St., San Francisco.

BANKS
First National Bank, Post and Montgomery streets, San Francisco.

BANK FIXTURES AND INTERIORS
Fink & Schindler, 218 13th St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.

BELTING AND PACKING
New York Belting and Packing Company, 519 Mission St., San Francisco.
H. N. Cook Belting Co., 401 Howard St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

BLACKBOARDS
C. F. Weber & Co., 985 Market St., San Francisco, Los Angeles and Reno, Nevada.
Beaver Blackboards and Greenboards, Rucker-Fuller Desk Company, Coast agents, 677 Mission St., San Francisco; also Oakland and Los Angeles.

BLINDS—VENETIAN AND DIFFUSELITE
J. G. Wilson Corporation, Metropolitan Bldg., Los Angeles; Waterhouse-Wilcox, Underwood Bldg., San Francisco.
Western Venetian Blind Co., Long Beach Ave., Los Angeles; C. F. Weber & Co., San Francisco.

BOILERS
California Hydraulic Engineering & Supply Co., 7072 Fremont St., San Francisco.
General Boilers Co., 322 Monadnock Bldg., San Francisco.
Kewanee Water Supply System, Simonds Machinery Co., 117 New Montgomery St., San Francisco.

BOOK BINDERS
Abbott Brady Printing Corp'n, 460 Fourth St., San Francisco.
H. S. Crocker Co., 565 Market St., San Francisco.

BONDS FOR CONTRACTORS
American Mutual Liability Insurance Co., Balboa Bldg., San Francisco.
Bonding Company of America, Kohl Bldg., San Francisco.
Bankers & Shippers Insurance Co. of New York, Insurance Exchange Bldg., San Francisco.
Globe Indemnity Co., 444 California St., San Francisco.
Fidelity & Casualty Co. of New York, Balfour Bldg., San Francisco.
National Surety Co. of New York, 105 Montgomery St., San Francisco.

BRASS GOODS, CASTINGS, ETC
H. Mueller Manufacturing Co., 635 Mission St., San Francisco.

BRICK, PRESSED, PAVING, ETC.
Richmond Pressed Brick Co., Crossley building, San Francisco. Plant at Richmond, Cal.
United Materials Co., Crossley Bldg., San Francisco.
Cannon & Co., Sacramento; and 77 O'Farrell street, San Francisco.

BRICK & CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
The Paraffine Companies, Inc., 34 First St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.
Wadsworth, Howland & Co., Inc., Boston, Mass., manufacturers of Bay State Brick & Cement Coating. Jas. Hambly & Son, agents, San Francisco and Los Angeles.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn., coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Palace Hardware Company, Agents Corbin goods, 581 Market St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora; Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.

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BUILDING MATERIALS, SUPPLIES, ETC.
Abeel-Jensen Co., Call Bldg., San Francisco.
Pacific Materials Co., Underwood Bldg., San Francisco.
Waterhouse-Wilcox Co., 523 Market St., San Francisco.

CABINET MAKERS
Home Manufacturing Company, 543 Brannan St., San Francisco.
Fink & Schindler Co., 218 13th St., San Francisco.
Mullen Manufacturing Company, 64 Rausch St., San Francisco.
Lannom Bros. Mfg. Co., 5th and Magnolia sts., Oakland.
Pacific Mfg. Co., San Francisco, Los Angeles and Oakland.

CARPETS
John Breuner Co., 281 Geary St., San Francisco.
D. N. & E. Walter, Mission near Second street, San Francisco.
W. & J. Sloane, 216-228 Sutter street, San Francisco.

CASEMENT WINDOW HARDWARE
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

CASTINGS
Victory Manufacturing Co., Monadnock building, San Francisco.

CEMENT
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.
Medusa White Portland Cement, manufactured by Sandusky Cement Co., represented in San Francisco by Pacific Building Materials Co., Underwood Bldg., San Francisco.
Old Mission Portland Cement Co., Mills Building, San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Armorite, sold by W. P. Fuller & Co., all principal Coast cities.
Bay State Brick and Cement Coating, manufactured by Wadsworth, Howland Co., Boston, Mass. James Hambly & Son, Distributors, San Francisco and Los Angeles.
Medusa White Portland Cement, manufactured by Sandusky Cement Co., represented in San Francisco by Pacific Materials Co., 525 Market St., San Francisco.

CEMENT FLOOR COATING
Lapidolith, manufactured by L. Sonneborn Sons, Inc., San Francisco, Los Angeles, Portland and Seattle.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CLAY PRODUCTS
Cannon & Co., Sacramento, Cal.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Tropico Potteries, Inc., Glendale, Cal.
United Materials Co., Sharon Bldg., San Francisco.

CLOCKS—ELECTRIC TIME
Pacific Electric Clock Co., 516 Wells-Fargo Bldg., San Francisco.
Standard Electric Time Co., 461 Market St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORS
"Linotol" plastic flooring, Hill, Hubbell & Co., 115 Davis street, San Francisco; 410 San Fernando Bldg., Los Angeles.

CONCRETE CONSTRUCTION
Barrett & Hilp, 918 Harrison St., San Francisco.
Clinton Construction Co., 140 Townsend street, San Francisco.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
P. A. Palmer, Monadnock Bldg., San Francisco.
I. M. Sommer, 401 Balboa Bldg., San Francisco.
Steelform Contracting Company, 681 Market St., San Francisco.

CONCRETE HARDENER
Gunn, Carle & Co., Inc., 444 Market street, San Francisco.

CONCRETE MIXERS
Foote and Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

CONCRETE REINFORCEMENT
Edw. L. Soule Co., Rialto bldg., San Francisco.
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Triangle Mesh Fabric. Sales agents, Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., 527 Tenth St., San Francisco.
Badt-Falk Co., Call-Post Bldg., San Francisco.

CONDUITS
Garnett Young & Co., 612 Howard St., San Francisco.

CONTRACTORS, GENERAL
Barrett & Hilp, 918 Harrison St., San Francisco.
Larsen-Siegrist Co., Inc., 807 Claus Spreckels Bldg., San Francisco.
R. W. Littlefield, 357 12th St., Oakland.
Lawton & Vezey, Call building, San Francisco; Plaza building, Oakland.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL—Continued
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
Unit Construction Co., Phelan Bldg., San Francisco.
J. D. Hannah, 142 Sansome St., San Francisco.
John M. Bartlett, 357 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.
Herbert Beckwith, 323 Newton Ave., Oakland.
Collman & Speidel, 546 Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Monson Bros., 251 Kearny street, San Francisco.
Fontanella & Teza, 1682 Eddy Street, San Francisco.
Geo. Wagner, 251 Kearny street, San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.
Lange & Bergstrom, Sharon Bldg., San Francisco.
McLeran & Co., R., Hearst Bldg., San Francisco.
Robert Trost, 26th and Howard Sts., San Francisco.
I. M. Sommer, 401 Balboa Bldg., San Francisco.
S. G. Jackson, 351 12th St., Oakland.
Jas. L. McLaughlin, 251 Kearny street, San Francisco.
Alfred H. Vogt, 185 Stevenson street, San Francisco.

CONTRACTORS' EQUIPMENT
Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Hearst Bldg., San Francisco.
Smith, Booth-Usher Co., 60 Fremont St., San Francisco; 228 Central Ave., Los Angeles.

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CONVENIENCE OUTLETS
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.

CRUSHED ROCK
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

DAMP-PROOFING COMPOUND
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Gunn, Carle & Co., Inc., 444 First street, San Francisco.
Hill, Hubbell & Company, 115 Davis St., San Francisco.
"Pabco" Damp-Proofing Compound, sold by Paraffine Co., 34 First St., San Francisco.

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Waterhouse-Wilcox Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Oregon.
Stanley Works, New Britain, Conn. Monadnock Bldg., San Francisco.
Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Drinking Faucet Co., 1808 Harmon St. Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 166 7th St., San Francisco.
San Francisco Elevator Company, Inc., 860 Folsom street, San Francisco.

ELECTRICAL CONTRACTORS
Butte Electrical Equipment Company, 530 Folsom St., San Francisco.
Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.
Brown-Langlais Electrical Construction Co., 313 5th street, San Francisco.
Central Electric Company, 185 Stevenson street, San Francisco.
NePage, McKenny Co., 589 Howard St., San Francisco.
Newbery Electrical Co., 359 Sutter street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Globe Electric Works, 1959 Mission St., San Francisco.
M. E. Ryan, Redwood City, and 520 Clunie building, San Francisco.
H. S. Tittle, 766 Folsom St., San Francisco.
Spencer Electric Co., 355 12th street, Oakland.
Spott Electrical Co., Sixteenth and Clay Sts., Oakland.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.

ELECTRICAL SUPPLIES AND EQUIPMENT
Garnett Young & Co., 612 Howard St., San Francisco.
Butte Electrical Equipment Co., 530 Folsom St., San Francisco.
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.
Safety Electric Company, 56-65 Columbia Square, San Francisco.
Drendell Electrical & Mfg. Co., 1345 Howard St., San Francisco.
Western Electric Safety Mfg. Co., Inc., 247 Minna street, San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 166 7th St., San Francisco.
San Francisco Elevator Co., 860 Folsom street, San Francisco.

ENGINEERS—CONSULTING, ELECTRICAL, MECHANICAL
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

ELEVATOR DOOR HARDWARE
Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

ESTIMATOR—BUILDINGS AND ENGINEERING WORKS
Arthur Priddle, 185 Stevenson street, San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FAIENCE TILE
Tropico Potteries, Inc., Glendale, Cal.

FENCES—WIRE
Standard Fence Construction Co., 245 Market St., San Francisco, and 310 12th St., Oakland.

FILLING STATION EQUIPMENT
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco, 830 S. Los Angeles St., Los Angeles.

FIRE ESCAPES
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE-PROOF DOORS
Forderer Cornice Works, 269 Potrero avenue, San Francisco.
U. S. Metal Products Co., 330 10th street, San Francisco.
Fire Protection Products Co., 3117 20th street, San Francisco.

FIRE SPRINKLERS—AUTOMATIC
Grinnell Company, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Co., 72 Natoma street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

FIRE RETARDING PAINT
The Paraffine Companies, Inc., 34 First St., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
The Fink & Schindler Co., 218 13th St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

FLOOR TILE
Mangrum & Otter, 827 Mission St., San Francisco.
S. & S. Tile Company, San Jose.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.

FLOORS—HARDWOOD
Oak Flooring Manufacturers' Association of the United States, Ashland Block, Chicago, Ill.
Parrott & Co., 320 California St., San Francisco.
Strable Hardwood Company, 511 First street, Oakland.

FLOORS—MASTIC
Hill, Hubbell & Company, 115 Davis St., San Francisco.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.
Jas. A. Nelson, 517 Sixth St., San Francisco.

FUEL OIL SYSTEMS
S. T. Johnson Co., 1337 Mission St., San Francisco.
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco.

FURNACES—WARM AIR
Mangrum & Otter, 827 Mission St., San Francisco.
Montague Range and Furnace Co., 826 Mission St., San Francisco.
Pacific Heating Company, Second and Grove streets, Oakland.

FURNITURE—BUILT-IN
Hoosier Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—SCHOOL, CHURCH, OFFICE, HOUSE, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
W. & J. Sloane, 216 Sutter street, San Francisco.

GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast Sale offices, San Francisco, Los Angeles and Seattle, Wash
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

GAS STEAM RADIATORS—FUMELESS, ETC.
Ra-Do Fumeless Gas Radiators, manufactured and sold by Baird-Bailhache Co., 478 Sutter St., San Francisco.

GLASS
American Window Glass Co., represented by L. H. Butcher Co., 862 Mission st., San Francisco.
Cobbledick-Kibbe Glass Co., 175 Jessie St., San Francisco.
Fuller & Goepp, 32 Page St., San Francisco, and Syndicate building, Oakland.
W. P. Fuller & Company, all principal Coast cities.

GRADING, WRECKING, ETC.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco.

GRANITE
California Granite Co., Gen. Contractors' Ass'n, San Francisco.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

GRAVEL AND SAND
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.
Del Monte White Sand, sold by Del Monte Properties Co., Crocker Bldg., San Francisco.

GYMNASIUM EQUIPMENT
Ellery Arms Co., 583 Market St., San Francisco.
A. G. Spalding & Bros., 625 Market St., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Corbin hardware, sold by Palace Hardware Co., 581 Market St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora, Ill., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Parrott & Co., 320 California St., San Francisco.
Strable Hardwood Company, First street, near Broadway, Oakland.
E. L. Bruce Company, American oak flooring, Memphis, Tenn.

HEATERS—AUTOMATIC, GAS, ELECTRIC
Electric Sales Service Co., mfrs. of Therm-elect Water Heater, West Berkeley.
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.
Ra-Do Fumeless Gas Heater, sold by Baird-Bailhache Company, 478 Sutter St., San Francisco.
Wm. J. Schwerin, Ag't Hulbert Electric Steam Radiator, Rialto Bldg., San Francisco.

HEATING AND VENTILATING CONTRACTOR'S, EQUIPMENT, ETC.
Atlas Heating and Ventilating Company, Inc., Fourth and Freelon streets, San Francisco.
Alex Coleman, 706 Ellis St., San Francisco.
C. A. Dunham Co., Sheldon Building, San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Knittle-Cashel Co., 224 Fifth street, San Francisco.
General Boilers Co., 332 Monadnock Bldg., San Francisco.
Mangrum & Otter, 827-831 Mission St., San Francisco.
James & Drucker, 450 Hayes St., San Francisco.
James A. Nelson, 517 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Mechanical Engineering & Supply Co., 908 7th St., Sacramento.
Scott Company, 243 Minna St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
Griffin Sheet Metal Works, Fresno.
W. H. Picard and F. J. Edwards, 5656 College Ave., Oakland.

HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O'Farrell street, San Francisco.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 553 Mission St., San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant streets, San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INTERIOR DECORATORS
Atherly Bros., 2032 Polk St., San Francisco.
Martin & Frederick, 1374 Sutter St., San Francisco.
John Breuner Co., 281 Geary St., San Francisco.
Taylor Galleries, 1635 Broadway, Oakland and San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

KITCHEN CABINETS
Hoosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING AND PLASTERING
MacGruer & Simpson, Call-Post Bldg., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.

LATHING MATERIAL
Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., Tenth St., near Bryant, San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

LIGHT, HEAT AND POWER
- Great Western Power Company, Stockton St., near Sutter, San Francisco.
- Pacific Gas & Electric Co., Sutter street, San Francisco.

LIGHTING FIXTURES
- Thomas Day Company, Mission, near Third street, San Francisco.
- Roberts Mfg. Co., 663 Mission St., San Francisco.
- Perfeclite Manufacturing Co., Seattle, Wash.; San Francisco Representatives, Myers & Schwartz, 75 New Montgomery street, San Francisco; 1119 S. Los Angeles street, Los Angeles.

LIME
- Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
- D. N. & E. Walter & Co., 562 Mission St., San Francisco.
- The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
- W. & J. Sloane, 216 Sutter street, San Francisco.

LUBRICATING OIL STORAGE TANKS AND PUMPS
- S. F. Bowser & Co., Inc., 612 Howard St., San Francisco

LUMBER
- Dudfield Lumber Co., Palo Alto, Cal.
- Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
- Pacific Manufacturing Company, San Francisco, Oakland, Los Angeles and Santa Clara.
- Pope & Talbot, foot of Third St., San Francisco.
- Santa Fe Lumber Co., 16 California street, San Francisco.
- Sunset Lumber Company, First and Oak Sts., Oakland.

MAGNESITE FLOORING, STUCCO, ETC.
- Dorite Mfg. Co., 116 Utah Street, San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
- American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

MANTELS
- Mangrum & Otter, 827-831 Mission St., San Francisco.

MANUAL TRAINING EQUIPMENT
- Richards-Wilcox Mfg. Co., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.
- Smith-Booth-Usher Co., San Francisco and Los Angeles.

MARBLE
- American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
- Ray Cook Marble Company, foot of Powell street, Oakland.
- Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
- Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
- Tompkins Kiel Marble Company, 505 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco

METAL DOORS AND WINDOWS
- Fire Protection Products Co., 3117 20th St., San Francisco.
- Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
- U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
- Forderer Cornice Works, 269 Potrero avenue, San Francisco.

MILL WORK
- Dudfield Lumber Co., Palo Alto, Cal.
- Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
- National Mill and Lumber Co., San Francisco and Oakland.
- The Fink & Schindler Co., 218 13th St., San Francisco.
- Lannom Bros. Mfg. Co., 5th and Magnolia sts., Oakland.

OFFICE EQUIPMENT
- C. F. Weber Co. 985 Market St., San Francisco.
- Rucker-Fuller Co., 677 Mission St., San Francisco.
- F. W. Wentworth & Co., 539 Market St., San Francisco.

OIL BURNERS
- Bunting Iron Works, 1215 First Nat. Bank bldg., San Francisco.
- Fess System Co., 220 Natoma St., San Francisco.
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- T. P. Jarvis Manufacturing Co., 275 Connecticut St., San Francisco.
- G. E. Witt Co., 862 Howard St., San Francisco.
- W. S. Ray Manufacturing Co., 29 Spear street, San Francisco.
- F. L. Warner, 696 20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
- S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE.
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Federal Ornamental Iron and Bronze Co., 16th St. and San Bruno Ave., San Francisco.
- Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
- Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
- California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
- Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.
Hill, Hubbell & Company, 115 Davis street, San Francisco.
Wadsworth, Howland Co., makers of Bay State Brick and Cement Coating, Boston, Mass.
James Hambly & Son, Distributors in San Francisco and Los Angeles.

PAINTING, TINTING, ETC.
Atherly Bros., 2032 Polk St., San Francisco.
Wayne & Williams, 1914 Fillmore St., San Francisco.
I. R. Kissel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
The Tormey Co., 681 Geary St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 414-424 Ninth St., San Francisco.
Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco and all principal coast cities.
R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
W. P. Fuller & Co., all principal Coast cities.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.

PARTITIONS—FOLDING AND ROLLING
J. G. Wilson Corporation, 600 Metropolitan Bldg., Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Francisco.

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS
Victory Manufacturing Co., Monadnock building, San Francisco.

PLASTER
"Arden" brand, A. C. Robertson, Builders Exchange, San Francisco. U. S. Gypsum Co.

PLAYGROUND APPARATUS
A. G. Spalding & Bros., 625 Market St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Thos. Brodie, 2119 Fillmore street, San Francisco.
Gilley-Schmid Company, 198 Otis street, San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College avenue, Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
All-In-One Plumbing Fixture Corporation, 231 Oschner building, Sacramento.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 553 Mission St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
Standard Metals Mfg. Co., 1300 N. Main st., Los Angeles; 216 Hobart building, San Francisco.
Victory Mfg. Co., 423 Monadnock Bldg., San Francisco.
West Coast Porcelain Manufacturers, Rialto building, San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.

POLES AND PILING
Santa Fe Lumber Co., 16 California street, San Francisco.

POWER PLANTS
Knittle-Cashel Co., Inc., 224 Fifth St., San Francisco.

POWER TRANSMITTING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PRELIMINARY ESTIMATES, VALUATIONS
Arthur Priddle, 185 Stevenson street, San Francisco.

PUBLIC QUANTITY SURVEY PLAN
Arthur Priddle, 185 Stevenson street, San Francisco.

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—HAND OR POWER, FOR OIL AND GASOLINE
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS
Arthur Priddle, 185 Stevenson street, San Francisco.

RADIATORS—ELECTRIC STEAM
William J. Schwerin, 217 Rialto Building, San Francisco.

RADIATOR TRAPS
C. A. Dunham Co., Sheldon Bldg., San Francisco.

REINFORCING STEEL
Edward L. Soule, Rialto Building, San Francisco.
Badt-Falk & Co., Call Bldg., San Francisco.
Gunn, Carle & Co., Inc., 444 Market street, San Francisco.
Pacific Coast Steel Co., Rialto Building, San Francisco.
Truscon Steel Co., 527 10th St., San Francisco.

REFRIGERATORS
McCray Refrigerator Company, San Francisco office, 765 Mission street.

ROOFING CONTRACTORS
Bender Roofing Company, Monadnock Bldg., San Francisco.
Hill, Hubbell & Co., 115 Davis street, San Francisco, and San Fernando Bldg., Los Angeles.

ROOFING AND ROOFING MATERIALS
"Malthoid" and "Ruberoid," manufactured by Paraffine Companies, Inc., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAND
Del Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, San Francisco and Los Angeles.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

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SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 985 Market St., San Francisco; 512 S. Broadway, Los Angeles.
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The Paraffine Companies, Inc., 34 First St., San Francisco.

SHEET METAL WORK
Forderer Cornice Works, 269 Potrero ave., San Francisco.
Griffin Sheet Metal Works, Fresno, Cal.
Knittle-Cashel Co., 224 Fifth street, San Francisco.
Pacific Heating Company, Second and Grove streets, Oakland.
U. S. Metal Products Co., 330 10th street, San Francisco.
Fire Protection Products Co., 3117 20th street, San Francisco.

SHINGLE STAINS
Bass-Hueter Paint Company, all principal Coast cities.
Cabot's Creosote Stains, sold by Pacific Building Materials Co., 525 Market St., San Francicco.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—STONE
McClenahan Products Co., Inc., 112 Kearny St., San Francisco.

SINKS—COMPOSITION
Petrium Sanitary Sink Co., Fifth and Page Sts., Berkeley.

STEEL HEATING BOILERS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
General Boilers Co., 332 Monadnock Bldg., San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 444 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Benson & Benson, The Alameda, San Jose.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Moore Shipbuilding Company, Oakland.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco, and Key Route Fell, Oakland.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Hill, Hubbell & Company, 115 Davis St., San Francisco.

STEEL ROLLING DOORS
Pacific Building Materials Co., Underwood Bldg., San Francisco.
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles. Waterhouse-Wilcox Co., San Francisco.
Rolph, Mills & Co., San Francisco, Los Angeles, Portland and Seattle.

STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 525 Market St., San Francisco.
"Lupton" steel sash, Waterhouse-Wilcox Co., agts., San Francisco, Los Angeles and San Diego.
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich. Direct factory sales office, Foxcroft Bldg., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS
Zouri Safety Sash Bars—Cobbledick-Kibbe Glass Company, 175 Jessie St., San Francisco.

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SUMP AND BILGE PUMPS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

SWITCHES AND SWITCHBOARDS
Wemco Safety Switch, manufactured and sold by W. E. Mushet Co., 502 Mission St., San Francisco.
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer's Safety Switch Co., 575 Howard Street, San Francisco.
Unit Electric Co., 450-60 Natoma Street, San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market street, San Francisco.
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.

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THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannon & Co., Sacramento; and 77 O'Farrell St., San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.
United Materials Co., Sharon Bldg., San Francisco.

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los Angeles, Portland and Seattle.

VALVES—PIPES AND FITTINGS
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
H. Mueller Mfg. Co., 635 Mission street, San Francisco.
W. E. Musbet Co., 502 Mission St., San Francisco
Victory Manufacturing Co., Monadnock building, San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.
Everlasting Blow-off Valves. General Machinery and Supply Co., 39 Stevenson street, San Francisco.

VARNISHES
Bass-Hueter Paint Company, Mission, near 4th street, San Francisco, and all principal coast cities.
W. P. Fuller Co., all principal Coast cities.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, 55 Stevenson St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
C. F. Weber & Co., 985 Market St., San Francisco.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, Rialto Building, San Francisco.

WALL BEDS, SEATS, ETC.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

WALL BOARD
"Amiwud" Wall Board, manufactured by The Paraffine Companies, Inc., 34 First St., San Francisco.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.

WALL PAPER AND DRAPERIES
The Tormey Co., 681 Geary St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Francisco.
Uhl Bros., San Francisco.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Bay State Brick & Cement Coating, manufactured by Wadsworth, Howland Co., Boston. Jas. Hambly & Son, Distributors for Northern and Southern California.
Gunn, Carle & Co., Inc., "Hydrate," 444 Market street, San Francisco.
Pacific Materials Co., 525 Market St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL
"Gold Seal," manufactured and sold by Bass-Hueter Paint Co. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.

WINDOW SASH CHAIN
The Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, 507 Mission street, San Francisco, and I. W. Hellman Bldg., Los Angeles.

WINDOW SHADES
National Window Shade Co., Inc., 244 Eddy Street, San Francisco.
W. & J. Sloane, 216 Sutter street, San Francisco.
D. N. & E. Walter, 562 Mission street, San Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Waterhouse & Wilcox, San Francisco, representatives.
Hauser Window Co., 157 Minna St., San Francisco.
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Francisco.

WIRE FENCE
Standard Fence Co., 245 Market street, San Francisco; and 310 12th street, Oakland.

WOOD MANTELS
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otter, 827 Mission St., San Francisco.

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THE best guarantee that any paint or varnish can carry is the number of tests it must stand before it reaches the market. If "blind tests" are significant, then Fuller Paints and Varnishes are worth-while products.

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PIONEER WHITE LEAD has been specified by architects for years, because it has an unfailing habit of making good. Master and journeymen painters are pleased when Pioneer White Lead is used on the job.

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HOLLYWOOD
LONG BEACH
WALLA WALLA
SEATTLE
PASADENA
PORTLAND
FRESNO
SALT LAKE CITY

THE ARCHITECT AND ENGINEER

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FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT

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Ancient California Architecture

By IRVING F. MORROW

THE following article is reprinted from the Pekin "Journal of Archaeology" of April 1, 4393, by special pre-arrangement with the editors:

Recent archaeological discoveries on the coast of California have aroused renewed interest in the architecture of the ancient civilization of North America. Readers of these columns have already been informed from time to time in regard to the extraordinary results of Prof. Chang's explorations and excavations. Every new discovery has introduced fresh perplexities into the carefully formulated theories of American life and art. In fact, Prof. Lin Tow has contended that future effort should be diverted from disconcerting investigation on the ground, and concentrated upon the analysis and interpretation of the data in our possession.

As is well known, Prof. Chang's attention has for some time past been occupied with those structures anciently known as "Missions," which were built along the coast of California around the nineteenth or twentieth century. Considerable uncertainty surrounds these buildings, but the names attached to them have led to the conclusion that they were founded by Christian missionaries from the Mediterranean countries of Europe for the purpose of civilizing the early Americans, who are known to have had an unusually material and industrial culture. The connection between European and American civilizations has never been completely understood. Although the names, locations, and aspects of these "Missions" have been reconstructed with considerable definiteness, no trace of the actual buildings seemed to have survived. Prof. Chang's most recent achievement is no less than the discovery of the first actual remains, which have been identified by a comparison of ancient illustrations as Mission La Purisima Concepcion.

The long-standing controversy between Dr. Wan and Prof. Chang touching the location of this building thus comes to an end. It will be remembered that the former authority, relying upon an exhaustive investigation of the available references in contemporary literature, has held that the site was in the Santa Ynez Valley, above the ancient town of Santa Barbara. The latter, on the other hand, after a careful study of fragmentary magazine illustrations in a precarious state of preservation, has maintained that it was nearer the general vicinity of Los Angeles. The recent investigations at Flintridge, near Pasadena, completely vindicate Prof. Chang's position.

But if this discovery closes the mooted question of location, it opens others of a much broader bearing on early Californian civilization. Many investigators have commented on the anomaly that, although ancient literature is full of appreciations of these so-called Mission buildings, all traces of the structures themselves have disappeared as completely as the legendary Sequoia Gigantea and Monterey cypress. It has seemed unreasonable that buildings held in such esteem should have been allowed completely to disintegrate, or that any accident should have wiped out the whole line,

FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL.
Myron Hunt, Architect

scattered over an extended territory. Some authorities have assumed that a natural cataclysm must have produced extensive geographical changes. Certain it is that some such changes have occurred. Read, for instance, the remains of the early commercial literature of Los Angeles relative to the city's port, and compare with the present relation of the harbor to the city site. But just how such geographical changes would have affected the Mission structures without touching other buildings remains unexplained. Prof. Lin Tow holds that the situation unmastakably indicates a Japanese invasion of the Pacific Coast of North America, during which the Americans undoubtedly used these buildings as points of military vantage, leading to their complete demolition by the Japanese. Basing himself on these propo-

sitions, which can not be controverted. Prof. Lin Tow is at present engaged on a history of the Japanese-American War, which undoubtedly must have been of great significance if it occurred. At any rate, there remains for explanation the curious fact that while all of the other buildings have completely disappeared, the structure of the present one remains intact except for the roofs, which ancient illustrations indicate to have been of wood. Certain ancient references allude to the buildings as "adobes," but Prof. Chang points out that this obviously originated as a natural printer's error for "abode," which is an ancient

LOGGIA, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL.
Myron Hunt, Architect

English word signifying "dwelling-place," the Missions having been of a monastery type, and that it can not be held to apply to the material of construction. The present building is of a hard, dense concrete, which has admirably withstood time and neglect, making it seem that the disappearance of the others must have been deliberate. Another curious circumstance is that the walls are double, with an open space between. Prof. Chang thinks that this was a natural device for maintaining a uniform temperature in the interior; but Prof. Lin Tow is of the opinion that it probably had some military significance, and that its use accounts for the destruction of the other Missions in the Japanese invasion.

The layout of the building raises other serious questions. Considered abstractly as architecture, the plan is admirable, although it conforms in almost no respect to the known Mission requirements. Prof. Chang has suggested that the building was really entirely secular in character; and, relying again on allusions in badly preserved architectural journals of the period, intimates that it may have belonged to that class known to the early Americans as the "Country Club." However completely a consideration of the plan seems to bear him out, the suggestion really appears on its face

CORRIDOR, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL.
Myron Hunt, Architect

rather preposterous, because these buildings rarely had any observable architectural relation to the country, while the building under discussion not only belongs unmistakably in the open country, but to the particular country where it stands.

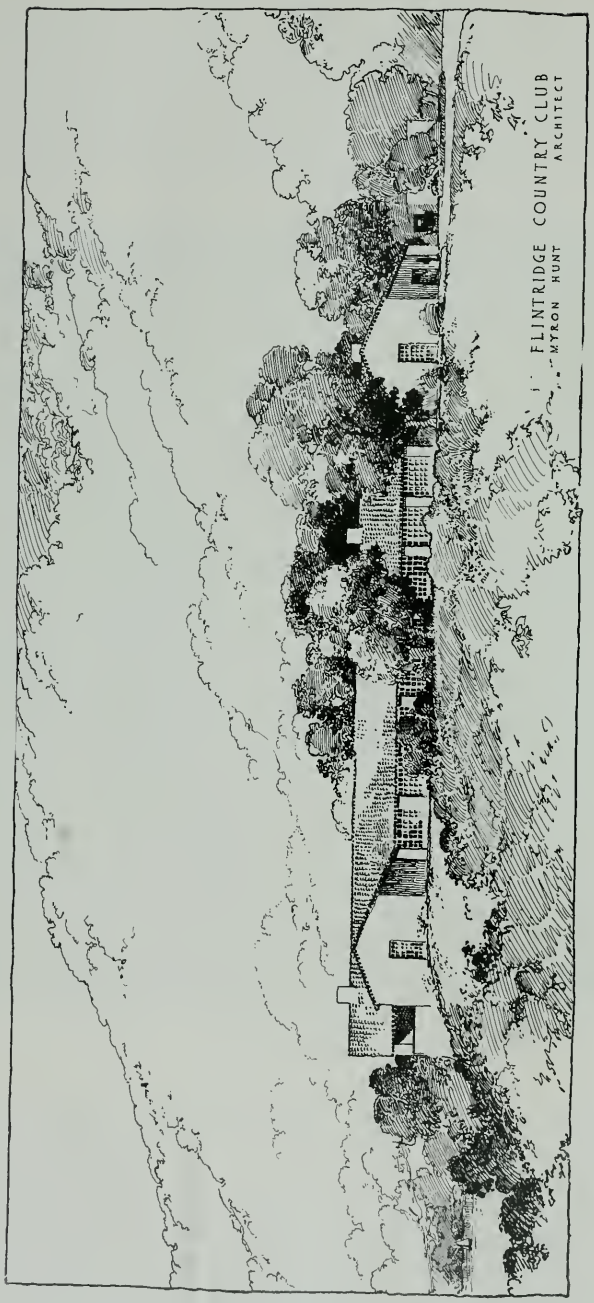
In fact, passing over for the moment controversies as to construction and purpose and looking at the building as an artistic achievement, its design is of the greatest interest. If, as Prof. Chang suggests, it is indeed a "Country Club," it is one of the most admirable and appropriate ones which has come to light. To carry the elimination of unessentials to such a degree and at the same time invest the unadorned essentials with never-failing interest and charm requires the sure touch of the real designer. Pro-

portions are distinguished and scale satisfying. The intimate harmony of a building of such poise in a landscape of this self-denying character is more impressive than all the impertinent elaboration that could be conceived and paid for

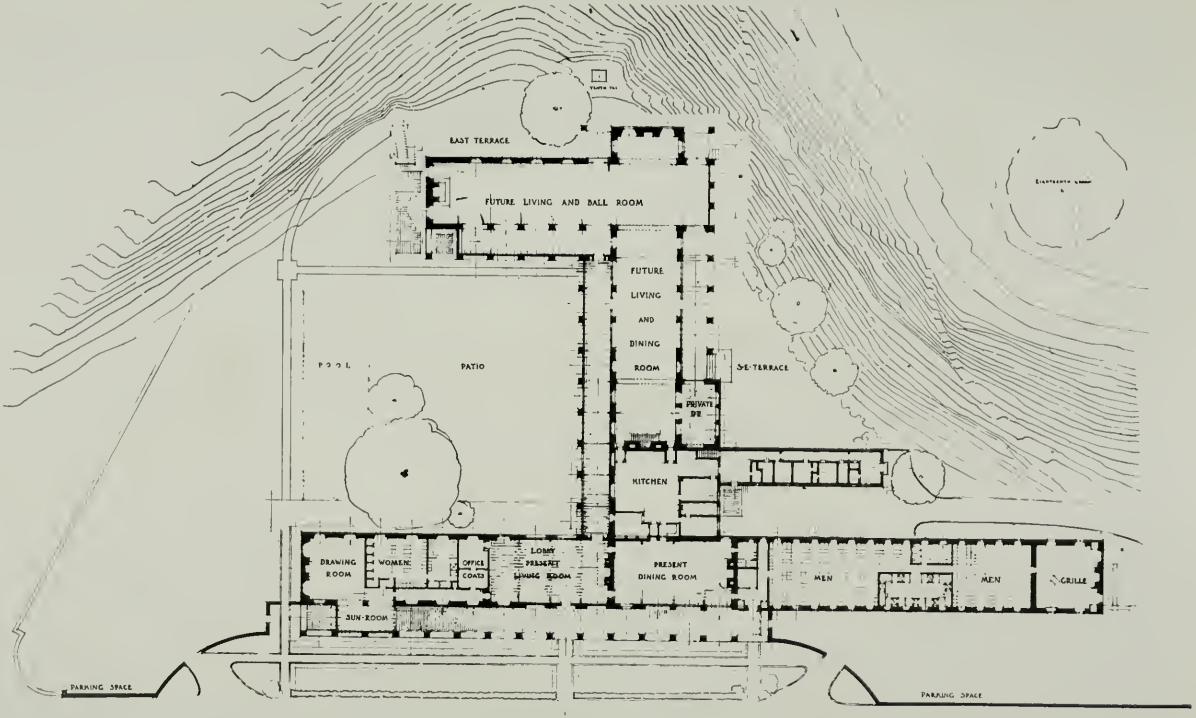
It is another strange fact in connection with this building that it is the only one of the ancient "Missions" the name of whose architect has been preserved. Contemporary references credit the building to a Myron Hunt, who seems to have been one of the most versatile designers of the period.

FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL.
Myron Hunt, Architect

In fact, the variety of work attributed to his name makes it plain that he could not have been one of the so-called "Mission Fathers"; unless, indeed, we assume that the name is only a symbol around which tradition has deposited a continuous accretion of anonymous fragments, much after the fashion of the poetical Homer of extreme antiquity, and the musical Wagner of about the nineteenth century. However, students of early Californian art are generally agreed that the name of Myron Hunt represents a real individual, and that he was one of the founders of the movement which bore such notable fruit in the architecture of the great period of California in the twenty-first century. This building certainly deserves its place in that tradition. Prof. Chang is to be congratulated.



FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT



FLINTRIDGE · COUNTRY · CLUB

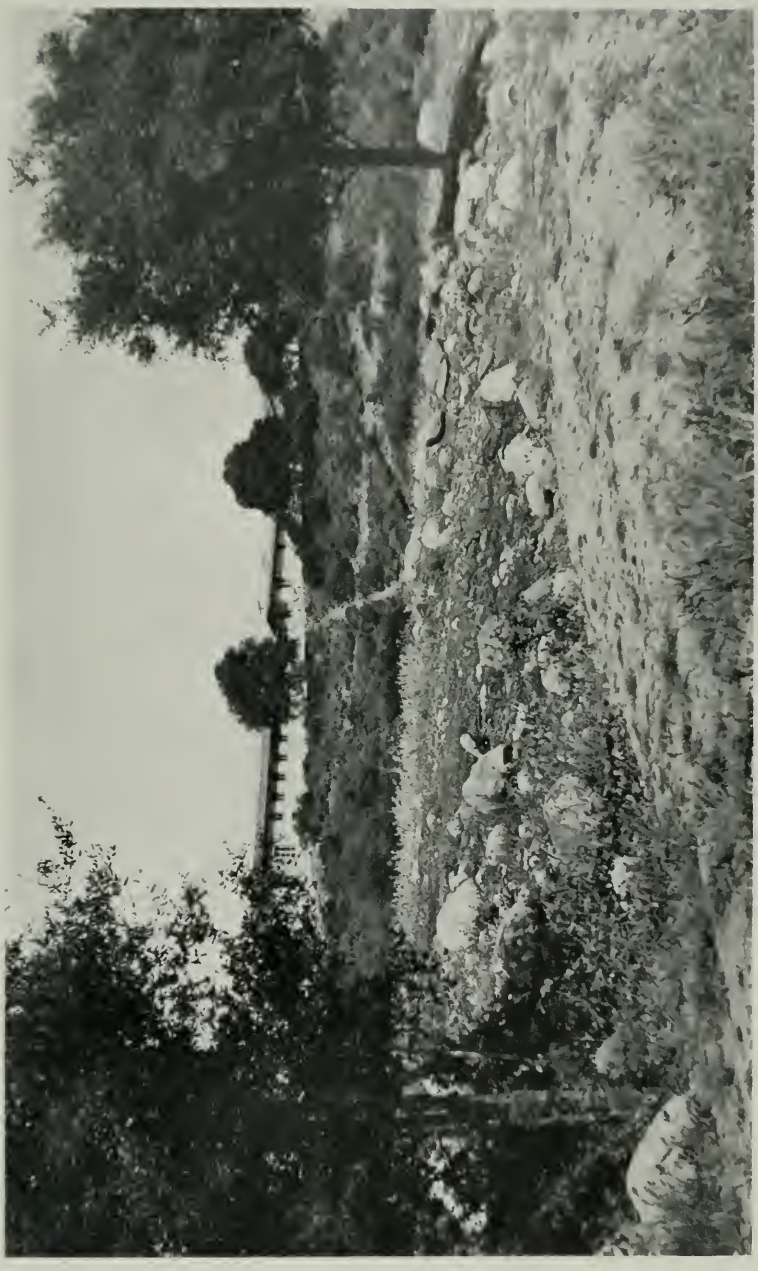
MYRON HUNT ARCHITECT

FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT

PRELIMINARY SKETCHES, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL.
MYRON HUNT, ARCHITECT

FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT

FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT



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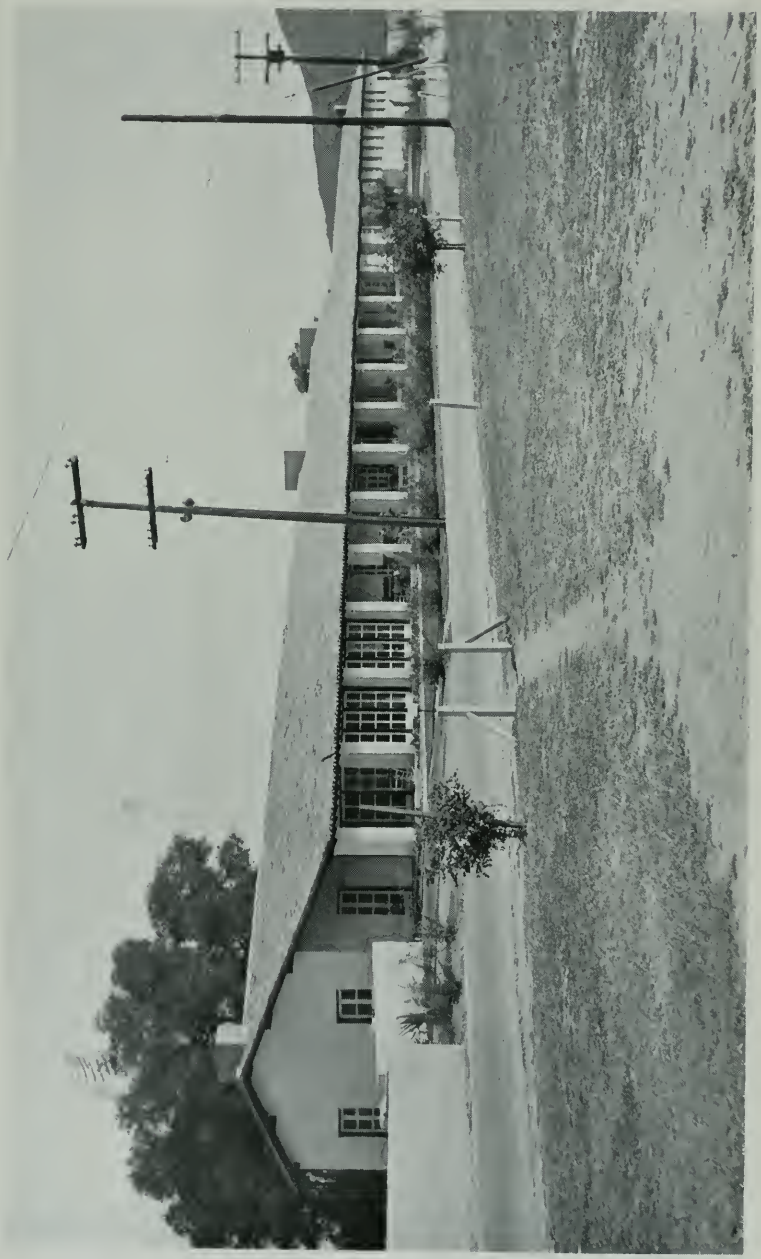

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PATIO, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT

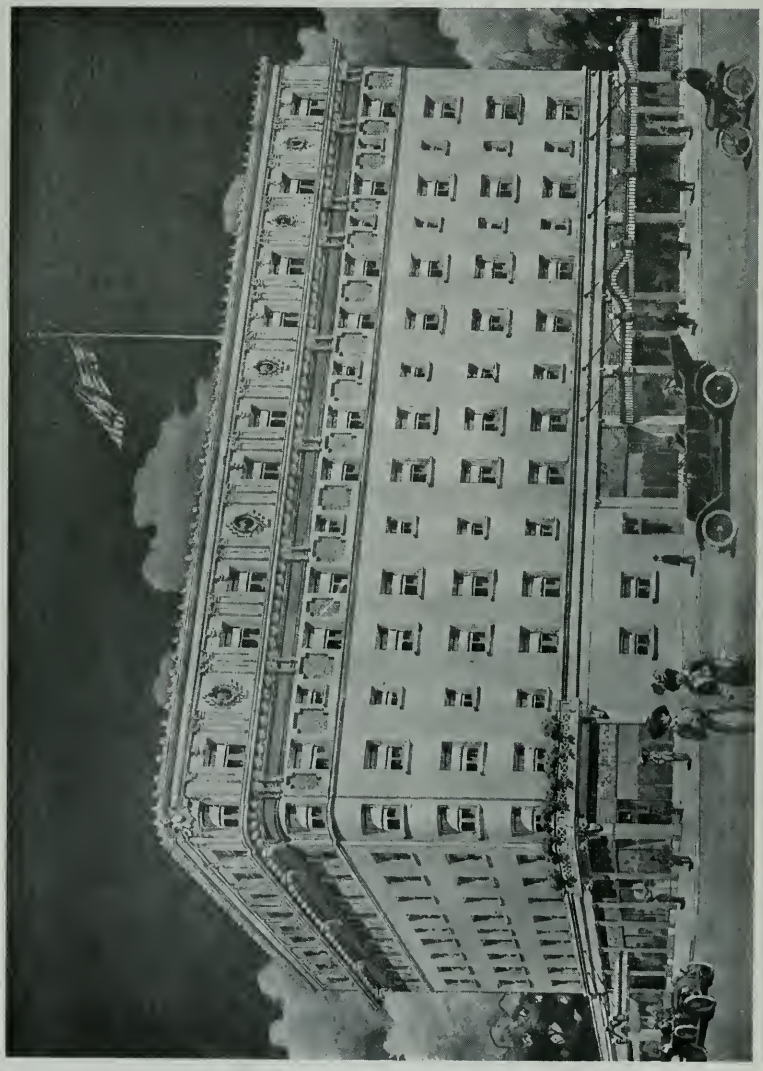
LOGGIA, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE, NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT

PRESENT DINING ROOM, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE.
NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT

PRESENT DINING ROOM, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE
NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT

SUN ROOM, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE,
NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT

DRAWING ROOM, FLINTRIDGE COUNTRY CLUB, FLINTRIDGE.
NEAR PASADENA, CAL. MYRON HUNT, ARCHITECT



CLARK HOTEL, STOCKTON
GLENN ALLEN, ARCHITECT

Portfolio of

SOME RECENT BUILDINGS

designed by

Glenn Allen, Architect

of Stockton

Photographs and drawings of these buildings will be shown in connection with an *Architectural Exhibition* to be held under the auspices of the Stockton Association of Architects, January 21-28, 1922.

HENRY APARTMENTS, STOCKTON
Glenn Allen, Architect

ENTRANCE, HENRY APARTMENTS, STOCKTON
Glenn Allen, Architect

WAREHOUSE FOR MR. H. S. DAWSON, STOCKTON
Glenn Allen, Architect

DETAIL OF FIRST STORY, WAREHOUSE FOR
MR. H. S. DAWSON

HOME APARTMENTS, STOCKTON
GLENN ALLEN, ARCHITECT

HOUSE FOR MR. EMIL GINGG, FOREST HILL, SAN FRANCISCO. GLENN ALLEN, ARCHITECT

STOCKTON MUNICIPAL MINERAL BATHS
Glenn Allen, Architect

VIEW OF POOL, STOCKTON MINERAL BATHS
Glenn Allen, Architect

TOWER, STOCKTON MINERAL BATHS
Glenn Allen, Architect

ENTRANCE, RESIDENCE IN CROCKER HIGHLANDS, OAKLAND
Glenn Allen, Architect

HOTEL CLARK GARAGE, STOCKTON
Glenn Allen, Architect

STAIRCASE, RESIDENCE IN CROCKER HIGHLANDS, OAKLAND
Glenn Allen, Architect

Lack of Uniformity of Load Requirements in Building Codes

*By RICHARD G. KIMBELL

(The Second of a Series of Articles on Building Codes.)

A PREVIOUS article cited the fact that of fourteen hundred and seventy-eight (1478) cities of over five thousand (5000) population in the United States, only four hundred and ten (410), or 27% of them, so far as has been determined, have a building code.

By persistent effort, a library of the codes of some three hundred cities has been accumulated. A careful study of them reveals some decidedly interesting and significant facts. This article will discuss only the live load requirements in the various codes. As the codes of cities located in close proximity to a larger city generally have similar requirements to those of the larger city, a group of sixty-five widely scattered cities of over twenty-five thousand population was taken as being representative and their codes examined to determine if the suspicion of a wide variation was founded on fact or surmise.

An effort was made to place the various loading assumptions under the headings found in these sixty-five codes. That effort brought out the first of the variations of this topic, there being so many divisions or groupings and so different as to make this impossible. Therefore, a group of occupancies believed to be representative was chosen and the load requirements tabulated thereunder. This, of course, meant the omitting of some of the requirements that were minor divisions under one group heading, and others that were separate and distinct. One code in addition to providing load assumptions for the various portions of different buildings, went even further and gave loads for the assembly halls of theaters, schools, hospitals, dance halls, hotels, etc., which were at variance with the loads under the other headings for the same buildings.

Possibly the most interesting of the variations brought out in this tabulation, and one of greatest significance to our home owners and builders, referred to dwelling loads. These range from 30 to 80 pounds per square foot for the first floor, 30 to 50 pounds per square foot for the second floor and 20 to 40 pounds for the attic. Is there rhyme or reason in this? Is a dwelling in City A liable to greater loads than one in City B? Generally the spans of joists are limited by deflection to prevent plaster cracking. On that basis a 2 x 10 will carry a 30 pound load over a 16′ 3″ span while the same timber will carry an 80 pound load for only 13′ 0″. Thus poor Jones in City A, where they require dwelling house floors constructed to accommodate a live load of 80 pounds per square foot must use a 2″ x 12″ joist for a 15.8 ft. span, while Brown in City B, who has only to provide for a 30 lb. load, uses a 26″ x 10″ joist for a span 7″ greater than Jones, with less lumber for each of his floor supporting members than Jones used. Is this fair or justifiable? Is there sense in requiring Jones to buy more material for the same purpose than Brown, making his building cost more, causing an investment on which he will never secure a return? If the 30 lb. load requirement is safe, what a great economic waste and needless hardship is caused by an 80 lb. requirement. If, however, a floor built to accommodate 80 lbs. per square ft. is the absolute minimum for safety and stability, this man Brown who builds to accommodate only 30 lbs. has erected a house of cards and created a hazard to the occupants of his building.

*Architectural & Building Code Bureau, National Lumber Manufacturers Association.

The following is a summary in tabular form of the occupancies and the ranges of the live loads for the sixty-five (65) cities:

Occupancy	Location	Range of loads in lbs. per square ft.
Dwellings	1st floor	30- 80
	2nd floor	30- 50
	Attic	20- 40
Tenements and apartments	1st floor	30- 80
	Above	30- 50
Store—light merchandise	1st floor	75-150
	Above	100-125
Stores—heavy merchandise	1st floor	120-250
	Above	200
Warehouses	Heavy	150-250
	Light	100-150
Factories	Heavy	150-250
	Light	100-150
Roofs	Pitch 20° or less	20- 50
	Pitch of more than 20°	15- 50
Assembly halls, theatres etc.	Movable seats	80-125
	Fixed seats	50-125
	Drill	100-250
	Dances	100-200
	Rooms	40-120
Schools	Corridors	60-125
	Assembly	75-125
Office buildings		40-100
Public buildings		50-150
Stairways and fire escapes	General	60-125
	Assembly	100-125
Garages	Public	70-175
	Private	40-125
Grandstands		80-125
Hotels	Rooms	30- 75
	Corridors	60-125
Hospitals	Rooms	30-100
	Corridors	80-100
Sidewalks		150-500

The loads for roofs having a pitch of more than 20 degrees from the horizontal, vary from 15 lbs. to 50 lbs. per square foot. "Oh yes," someone remarks, "that variation is accounted for by the fact that a city with a 50 lb. load provides for a snow load in addition to the other loads, while the city with a 15 lb. load is probably in the southern part of the country, where they have no snow loads." That would seem logical, but is, however, not borne out by the facts. Although southern cities as a rule have lower roof load requirements than the northern cities, this does not hold true in all cases. One city with a 15 lb. load is within two hundred miles of a city with a 50 lb. load, and both are in the northern New England States. Indeed, the 15 lb. load city is about one hundred and fifty miles north of the city having the greater load. Roof loads should undoubtedly vary according to climatic conditions, but the particular instance cited shows clearly that, in many cases, they are not within reason. Such variations in cities where conditions are similar proves the majority of our building laws are based neither on logic nor judgment.

Further, what of the variations of from 30% to 100% for industrial buildings? And what about the great variance in the quantity of materials required in this type of structure? This question, however, hardly needs discussion, as a practical engineer will readily realize the loss, waste and inconvenience of such different standards, and when brought to his attention will generally make an effort to right the wrong. With the prevailing ordinances should his practice be wide and diversified, and dis-

tributed over a considerable territory, he must have in his possession the building laws of all the cities where he erects structures to be able to meet the local requirements in his designing.

Furthermore, such variations prohibit and prevent standardization in the design of various structural units otherwise entirely possible.

The opinion is held by some that where the requirements as to floor loads are low, the allowable unit stresses for structural materials are correspondingly low, and where the live loads are high, the attending stress values are also high—thus in a way balancing the variations so that approximately the same amount of material would be used in both localities for a building of the same character. This, however, is not true in the majority of cases. A city with high load requirements may have the same allowable unit stress for materials as a city with low loads, and vice versa. This has been verified by our examination of the some three hundred codes in our library. The variations in the allowable stresses and their effects will be presented in a subsequent article.

* * *

New Orleans Skyscraper 147 Years Old; Still Stands

THE following story of New Orleans' first skyscraper from the Times-Picayune is an interesting account of some of the earliest construction work done in the skyscraper field:

"Towering high above the city, the skeleton frame of the new Hibernia Bank building rears its cupola, twenty-three stories in the air. Below, the masons already are at work placing in position the great blocks and graceful arches that will form the outer walls of the structure. It is the highest building ever erected in New Orleans.

"And within sight of the towering cupola, nestled in a strange huddle of dwellings, far down the Rue Royale, the first skyscraper of old, old New Orleans still stands.

"Stripped of all its old time grandeur with its queer narrow hallway and still narrower stairway it stands a venerable reminder of those other days, when, in its brave finery of hand wrought grills and slender gallery railings, the first skyscraper caused fashionable Nouvelle Orleans to gasp in wonder.

"It was in those brave old days of Spanish occupation, three years before the minute men of Lexington had fired the first muskets in the struggle to make the colonies free, that the first 'towering landmark' was built.

"Tradition still tells of the horrors experienced by those old Creole fashionables when the new owner of that little tract of land on the Rue Royale, at the corner of what is now St. Peter street, told his neighbors that he was about to build the 'mammoth' four-story-and-a-half 'scraper.' And of the vigorous protests that were made in the old Cabildo, the structure in which Don Alexandro O'Reilly ruled, perhaps to the doughty Irish-Spanish leader in person, against that soaring structure by those who feared that such a spindling, mountainous plinth would topple into the streets if, perchance, the winds blew briskly.

"But, if Don O'Reilly heard these pleas, he was busied with other affairs in those days of 1774. The building shot skyward. Nor were the fears of those old Creoles realized. It still stands today, despite the fire that swept its neighbors to the south, destroying even the Cabildo, in 1780, together with the records that should give the history of its construction.

"But now evil days have come to the old building, and now, while its splendid neighbor soars skyward, its status is that of a tenement."

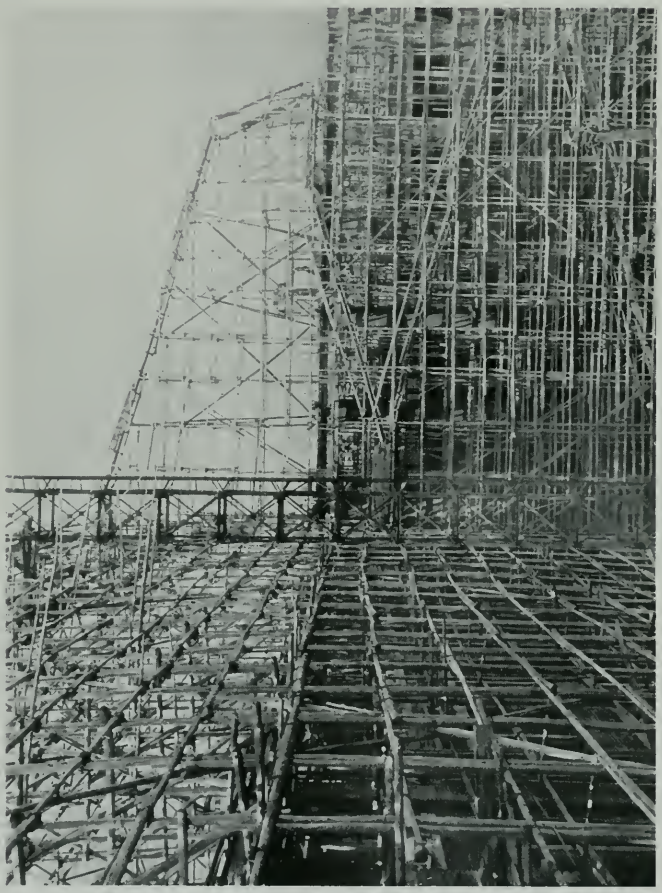


Photo by "International" BUILDING IN JAPAN

An eight story structure of wood, the first ever attempted. The staging is like that for a one story hut. No nails are used and the timbers are mere saplings.

Photo by "International"
QUEER SCAFFOLD USED BY JAPANESE BUILDERS

This scaffold is used in many parts of Japan by house builders. It consists of long poles lashed together with heavy thongs, and erected in a square around the building site.

Present Day Progress in Home Decoration

More progress has been made in home decoration during the last ten years than in any of the other arts and crafts. In most homes today, gloomy reminders of bad periods have been relegated to the attic or the furnace and the modern home reflects the learning and culture of its owner. Not so the home of 1861 or 1910. The home lover was forced to make her selection from a very restricted number of good designs. Today she has all the designs which have ever been produced to select from and each season brings a number of newer ones.

* * *

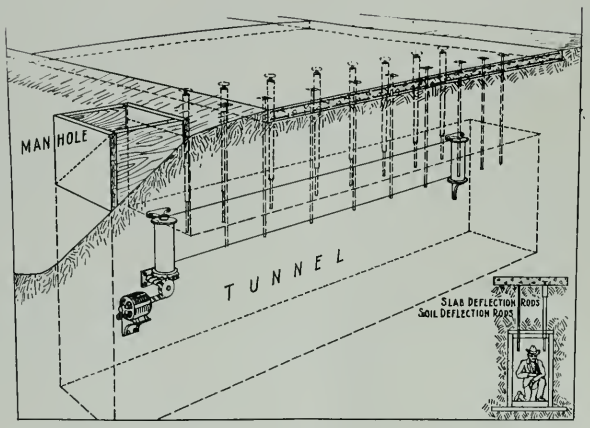
Ants Destroy Wooden Poles

According to Mr. R. J. C. Wood white ants have been attacking the untreated poles of the Southern California Edison Company at various points south of the Tehachapi. Boring into the pole below the surface of the ground the ants honeycomb the wood leaving only a thin shell on the outside. First evidence of the destruction caused by the ants is revealed when the pole is blown down or an attempt made to move it.

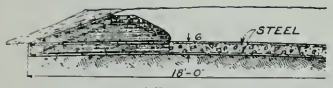
* * *

Aviating Fish

"What are the screens on the windows for? You told me there are no mosquitoes here," said the suspicious purchaser of a lakeside bungalow. "Why—er—ta keep out the flying flsh," said the agent.—Exchange.

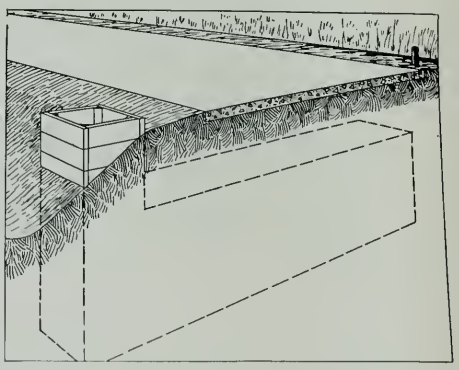


OBSERVATION TUNNEL BUILT UNDER TEST HIGHWAY



SECTION G
REINFORCEMENT-69 TONS PER MILE

SHOWING LOCATION OF OBSERVATION TUNNEL IN RELATION TO CONCRETE SLAB



TEST HIGHWAY AT PITTSBURG, CAL.

Concrete Test Highway at Pittsburg

THE greatest, and one of the most important, highway tests ever undertaken in America is now being conducted at Pittsburg, Contra Costa County, California, and probably will be concluded during the current month, as the road is fast giving way. Forty government motor trucks are being driven around a concrete test highway, one-quarter mile in length, 18 feet in width, and built in the form of a racetrack. The trucks will continue to be driven around the track until the test highway is totally destroyed. Complete checks of results at all stages are being made, so that at the conclusion of the test the results will be available in practical form and used to advantage in determining what types of concrete construction are best adapted to California soil conditions.

Many observations are being made on the test highway which were never attempted before.

Four tunnels were built beneath the pavement for the purpose of taking observations on the underside of the slabs, to determine the effect of various truck loads and speeds on the flexure of the slabs, as well as on the subgrade.

Self-recording instruments are being used in each tunnel, which indicate directly the flexure caused by loads on top of the pavement. Embedded in the concrete slab and extending down into the tunnel are a number of rods. To the end of each rod is attached a recording pen. As the motor trucks pass over the pavement directly over the tunnel the flexure will be recorded on the reading sheet, which is driven by an electric motor.

The soil deflection rods are provided with a plate at one end which rests directly under the concrete slab and shown at B.B. These rods will be equipped with veriniers for the purpose of observing the deflection of the subgrade as the motor trucks pass over the pavement.

Forty motor trucks are now operating over the test highway, twenty going in each direction.

The reading sheets will be filed daily, which will give a perfect record of slab and subgrade deflection throughout the entire test.

It is believed that these under-slab tests will be of great service to all road builders, as it is the first time that it has been possible to make observations from the under side of the pavement.

MODEL OF TEST HIGHWAY

The man is holding two pieces of reinforcing steel of 70,000 lbs. tensile strength. Several sections of the track are reinforced with this steel.

VIEW OF TUNNEL, SHOWING THE RECORDING PEN AND RECORD SHEET

SPECIAL DEVICE FOR PLACING REINFORCING STEEL.

Mr. Jno. B. Leonard is standing in the center of the group. Mr. Lloyd Aldrich is at the left of Mr. Leonard.

On each side of the test highway there is a ditch, and it is so arranged that water can be turned into the ditches and raised to the height of the top of the subgrade. This will make it possible to study the moisture effects on the subgrade. Holes have been provided in the concrete pavement, which have been filled up with wooden plugs. These plugs will be removed and borings will be taken in the subgrade when the latter is perfectly dry. The borings will then be replaced and tamped, and the water turned into the ditches, after which boring will again be taken to determine the rate of percolation. From the observations taken in the tunnels the relationship between the moisture content of the subgrade and its bearing power under traffic will be learned.

The extensometer will also be used to measure these loads from the under side of the reinforced slabs—the first time that this has ever been done. Readings will also be taken with this instrument on top of all slabs. A forked extension has been devised in using the extensometer in measuring the loads from the bottom of the reinforced slab. Two steel points will be screwed into the end of the extension. These points will fit into holes drilled in the under side of the reinforcing rods directly over the top of the tunnel. The extensometer will be attached to the lower end of the extension, which will enable observation of the extensometer from the tunnel proper. Without the extension it would be very difficult, if not impossible, to use the extensometer in measuring loads from the bottom of the reinforced slabs.

The surface of the test highway has been marked off into six-foot squares, which are numbered and lettered in such a manner that a progress record will be made of all cracks. As a crack appears in any section of the test highway it will be recorded on a chart, and when the test is completed the chart will show the location of every crack, and when and how it occurred. All cracks appearing during the first month of the test will be

marked on the chart in brown, those for the second month in green, and so on.

A novel feature in connection with this test highway is the fact that it is built in the form of a racetrack, a general view of which is shown. The road is 18 feet wide and 1,371 feet in length on the center line and comprises thirteen sections of concrete pavement of various types—both plain and reinforced.

A set of scales of 50 tons capacity has been provided for weighing the various trucks that are taking part in the test. In order that the tests may be carried out at night a powerful floodlight has been erected on the roof of the office. This completely illuminates the entire test highway, enabling a newspaper to be read at the far end of the track.

Before starting the building of this test highway questionnaires were sent to the highway engineers of the state, asking for their views as to what should be included in the test, or any other suggestions. State and federal engineers were also consulted with the same object in view. The hearty cooperation of all was freely given, with the result that thirteen types were selected as conforming nearest to all the views given. One section typifies the construction recently adopted and now being used by the State Highway Commission.

On December 21, 1921, the side ditches of the highway were flooded and samples of the subgrade were taken on December 30. It is evident that the original subgrade was so compact that it is practically impervious to water, and it is not thought that it will become saturated except through the medium of suction under the slab created on the pavement.

Very recently more than 200 delegates representing the Boards of Supervisors of many of the state's counties, county engineers and automobile interests, gathered at the Pittsburg track to observe the manner in which the highway is standing up. A number of these officials expressed themselves as surprised at the manner in which the different sections are holding out.

The project originated in the mind of Mr. Jno. B. Leonard, M. Am. Soc. C. E., who was also responsible for the observation tunnels and the special instruments installed therein. Mr. Lloyd Aldrich, consulting highway engineer, is associated with Mr. Leonard in these highway tests, which are made possible by the hearty cooperation of the following, who have contributed material, machinery, instruments, services, and money:

Automobile Club of Southern California; Bates & Borland, general contractors; Blake Bros. Co., crushed rock; Edward R. Bacon Co., contractors' equipment; California Highway Commission; Columbia Steel Company; California Corrugated Culvert Company; Coast Rock and Gravel Co.; Ralph M. Heintz, makers of scientific instruments; R. E. Noble & Co., inspecting engineers; Old Mission Portland Cement Co.; The Frederick Post Co., engineering and surveying instruments; H. H. Robertson Co., Robertson's process cement fibre; Smith-Booth-Usher Co., contractor's equipment; Smith-Emery & Co., inspecting engineers; Stuart S. Smith & Co., machinery merchants; Spears-Wells Machinery Co., contractors' equipment; Taylor Instrument Co., thermometers, etc.; United States Bureau of Public Roads; Yuba River Sand Co.; California State Automobile Association; city engineer's office, San Francisco.

Plan to Standardize Construction Contracts

THE standardization of construction contracts, towards which all far-sighted men in the industry have been looking for the last twenty years, seems destined to be achieved at last, through the united efforts of a conference held in Washington, D. C., recently.

This conference was composed of delegates appointed by eight national societies representing the engineers, architects and contractors of the United States, and the definite plan adopted was one which would ultimately produce a standard form of contract "agreement" which would be acceptable in all sections of the country and in all phases of this huge industry, which now ranks second only to agriculture in national magnitude.

Every constructor and owner who has wrestled with the intricacies of a contract, or worried over the exact yet doubtful meaning of its many complicated and legalized phrases, will approve this first attempt to frame in simple Anglo-Saxon words an equitable and universal document.

A survey of the situation made several months ago by Brigadier-General R. C. Marshall, Jr., formerly Chief of the Construction Division, U. S. Army, during the world war, disclosed the fact that today there are in common use throughout the construction industry, **over 200 different forms of contract,** and that no one state or section had yet been able to establish any one form as standard or customary.

Expert engineers at the headquarters of the Associated General Contractors of America, in Washington, were then assigned to the task of analyzing these 200 different forms in order to discover whether the variety of "jobs" involved required any such variety of forms.

After many months of painstaking comparison and research, Mr. W. P. Christie, in charge of this work as research engineer for the Associated General Contractors, reported that the differences were chiefly superficial differences of words and phrasing, rather than differences of meaning or stipulations, and that at least two-thirds of all the provisions contained in each of the 200 documents were common to all documents, and therefore could be included **in one standard contract form,** if rewritten in simple universal style.

It was found that stipulations which were characteristic or peculiar to the building trades, or to the railroad construction field, or to water work projects, or to highways could be assembled together in one standard form, entitled "general conditions," applicable to that one field of construction only, and added to the standard agreement form as addenda.

In this way, it would be quite possible to draft a **standard contract** which would cover all cases of construction work, no matter in what field, and the only alteration that would ever need to be made to it would be in selecting the standard form of "general conditions" which covered the type of job concerned. Experts believed that a half dozen such forms would cover the main subdivisions involved in the construction industry.

This plan, together with a tentative outline, was submitted for consideration to the—

American Association of State Highway Officials.
American Engineering Council.
American Institute of Architects.
American Railway Engineering Association.
American Society of Civil Engineers.
American Waterworks Association.

Associated General Contractors of America.
National Association of Builders Exchanges.
Western Society of Engineers.

All made favorable responses and appointed representatives to come to Washington to constitute a conference on the subject and proceed with the drafting of a tentative form of contract, which could later be officially submitted by the conference to its constituting bodies for criticism, amendments, and ultimate ratification.

The conference met in the assembly room of the Department of Commerce building, in Washington, December 15 and 16, and was addressed by Secretary of Commerce Hoover and General Marshall, both of whom expressed a very lively and sincere hope that the conference would ultimately devise a form which would become as standard in its field as the standard forms of bank checks, notes and mortgages are in the field of banking and commercial trade.

Secretary of Commerce Hoover said, in opening the conference:

"Well, gentlemen, this conference is to consider whether something can be done to standardize or simplify or reinforce or generally improve the whole basis of contract forms used in the construction industry.

"I believe there is a great field there, not only in protection to the public, but in the general improvement of ethics in the industry itself. I don't profess to know much about it, but it is a matter that has not come under my purview for some years. I have been too much out of the engineering work for the last seven years to give much thought to it.

"I know that the time I was in engineering work this whole variation and specification of the contract basis for construction work of all kinds was an outstanding sore, and I have been in hopes that it was possible to do something. It all comes in line with the things many of us are much concerned with, and that is fundamentally the elimination of waste, lost motion, improvement of business practices throughout the whole of the United States.

"We have to remember that we have now an enlarged and inflated cost of distribution primarily, rather than production, and that we have a disparity due to the fundamentals of the increase in federal taxation and railway rates that are making a wider margin between production and final distribution costs than we have ever had to face before, and unless we can crowd that margin down somewhat by just sheer increase in efficiency, we are not going to be able to hold up the standard of living in this country and hold up our competitive position outside. So this is one of those things that ramify in many directions.

"I now, therefore, leave it to you, and we are glad to have you come to this department, because we have started a definite program along all these lines, not from a point of view of trying to compel anybody to do anything, but trying to mobilize all the different branches of industry for cooperative action, and while you can do much to get this thing straightened out it is probable that the Department of Commerce could be of moral assistance to you in getting it over when you have once arrived at some conclusion, and we will be delighted to back up anything that you come to an agreement on, and I have been astonished at the desire of the different industries to effect these things in very direction and their willingness to cooperate with other industries to make the work of each individual industry effective.

"We had the case the other day of the simplification of certain manufactured articles. The great majority of the manufacturers were represented here, but claimed that some minority would not help. They could not do anything without the assistance of other branches, and, therefore, I called in both the wholesalers and retailers in those directions and asked them if they would cooperate, and they have cooperated so far as to almost set up a boycott against certain manufacturers because they would not fall into line with the great majority, and they did it purely out of national interest.

"Somebody somewhere has got to eliminate the waste in this whole situation. I only mention that as a point where this department can be of help in getting the allegiance of the related industries and trades, and help you to get over some program of this kind.

"So that all I am doing is to give you our blessing and to tell you that the Department of Commerce is yours. Go to it.

"Now it is up to you, I think, and if there is anything in the department by which we can be of help, statistical or otherwise, do not hesitate to call on us."

The aim of the conference in beginning work on this difficult task was to achieve the following advantages for the entire construction industry and all its affiliations:

(1) Less expenditure and legal service.
(2) Less duplication of work in the professions.
(3) Elimination of disputes.
(4) Better safeguard for owners and increased public confidence.
(5) An improved standard of construction service throughout the country.

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Concrete Ship "Faith" Sells for $5,735

During the war a great deal of publicity was given to the building of concrete ships, and predictions were not lacking that these vessels would revolutionize the ship-building art. Perhaps the most famous of these new vessels was the steamship "Faith," of 3,427 tons gross. It is estimated that this cost about $750,000 to build in 1918. In order to satisfy various claims, the "Faith" has just been sold at auction for $5,735. This represents some little depreciation in three years, after the hundreds of columns of publicity showing the astounding merits of concrete ships.—Stone.

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Now Comes the "Glass Plumber"

The introduction of the vacuum-tube light has brought into existence the new trade of "glass plumbing." The glass tubes, in which the light is produced by an electric current flowing through a gaseous conductor, are an inch and three-quarters in diameter, and are put up in length of about 8½ feet, and hermetically sealed in place. For the purpose of this work a set of glass-blowers' instruments has been invented, including cutting tools, blowers and hand torches, and experts perform the necessary operations with surprising rapidity.

Giving Expression to Modern Architecture

By WALTER W. COOK, in New Orleans Building Review

ARCHITECTURE has been referred to as "Frozen Music." I think that applies to design and ornamentation. To my mind architecture is more human. I feel that all buildings can be classified somewhat as individuals are. The building which expresses the individual use and arrangement best is the better building.

How can we arrive at that result? None of our buildings do so a hundred per cent. It is only by striving continually to approach perfection that it will ever be accomplished. An architect must not be held personally responsible for inability to do this, as the owner or client must be of the same mind if it is to be done. It is the architect's work to try and bring this about. In this age of commercialism, dollars and cents play such an important part that idealism is apt to be brushed aside—justly so in a great many cases.

The people themselves have been expressed in the architecture of the past and, to my mind, this will always be the case. In a cosmopolitan country like America, it will be a long time before any national style will be developed. Architecture is like a language and it is as difficult to invent new forms and new designs as it is to invent a new word or to force Esperanto on the world.

In brief, the people of any community must be united to produce a lasting or an individual style such as the Greek simplicity, the strong Roman period, Italian renaissance and later French and English renaissance periods.

New materials, such as steel and the modern use of reinforced concrete have developed a new kind of structure, but we continue to clothe these structures with the forms and ornaments of earlier periods.

Architects who best adapt the real work of the past to our modern structures will produce the best results and the forms that are used must express the character and the use of the building to best advantage.

Architects must, to my mind, sit down with the owner and talk dollars and cents at the start and determine what the client is willing to spend for exterior treatment of his building—especially for commercial buildings. At the same sitting, Mr. Architect must set forth the facts which are becoming more evident every day that the proper exterior treatment of any building is worth dollars and cents to a client for advertising value as well as the morale of his business. There is no doubt as to the value of the owner of a good looking, well kept manufacturing plant. The architect must obtain effects with the simplest and most economical of treatments that will best express the use of the building. To illustrate: It would be folly to put a Greek temple front on a power plant.

Excellent results are obtained by the simplest of treatments, combining good proportion with proper scale; but the plan and use of the building comes first and, if this has been studied so that the plant works out to its very best advantage, the elevation will take care of itself and is bound to express, outwardly, that which is going on within.

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Standardization of Glass

Standardization of the different kinds, qualities and sizes of window and plate glass used as a building material and for many other purposes was discussed at a recent conference between glass distributors, architects, and engineers of the bureau of standards of the Department of Commerce.

The Architect and the Structural Engineer

THE following is a summary of a paper read at the forty-ninth ordinary general meeting of the Concrete Institute at Westminster, S. W., by Mr. William E. A. Brown, A. R. I. A. B., M. C. I.:

An architect is necessarily a structural engineer, with the addition of the artistic sense and skill to clothe the structural forms with beauty of line and contour, and to so arrange mass and void into one harmonious whole, studying the great lessons of the past, and carrying on the architectural traditions of ancient Greece and Rome, down through the Middle Ages, and on through the Renaissance. The architects of such buildings as the Church of Santa Sophia at Constantinople; St. Peter's at Rome; the Pantheon, Rome; the Duomo of Florence; and to come down to more recent time, Sir Christopher Wren's masterpiece in London, and Bentley's last great work of Westminster Cathedral, were structural engineers.

Were not all our cathedrals, which were the delight of artists and lovers of the beautiful, wonderful examples of architects' engineering skill?—majestic buildings with vaulted roofs poised on slender pillars and held in position by flying buttresses, each thrust met by a counter thrust, all combined so as to keep the whole structure in a stable condition.

Structural engineering includes not only steel work used in buildings, but also all forms of construction, whether in brick, stone, timber or concrete, and in designing buildings, and other structures the architect was called upon, not only to exercise his artistic ability, but also as to plan and arrange the various materials to carry, in addition to their own weight, all superimposed loads and external forces, so that the whole might remain perfectly stable.

No doubt the Council of this Institute had this in mind when it was decided to enlarge the scope of the Institute by adding structural engineering, and not to confine itself to one branch only, i. e., concrete and reinforced concrete. The wisdom of this, he thought, was manifest by the large increase in the membership as well as by the greater attendance at the meetings.

It was the architect and the architect alone, who should determine the position of all main girders, stanchions and supports. In many buildings it was impossible to proceed with the design until these positions were determined. In some cases it was the run from north to south or east to west. In others it would be such a feature as a dome; for example, how could Wren have planned St. Paul's, unless he knew before hand how he was going to support that great and glorious crowning feature of his design? That building could not have been erected had Wren simply made a drawing and handed over the structural work to someone else to deal with; or had that course been adopted, the resulting design would have been different to that made by the architect.

There was no doubt that tradesmen and others who did not realize the importance of having a properly qualified professional man to advise them. They were led to believe and fondly imagined that they were saving a large sum in fees, until they found by experience that their folly had cost them more. It was not his intention or wish to belittle in any way the status of the consulting engineer, as he occupied a very important position in the building world. But what he did

wish to emphasize was that it was the architect's duty to determine the position of all girders and supports in the building he designed. He should also be able to make the necessary calculations for the steelwork in, at any rate, the smaller buildings under his control. Architects often did employ consulting engineers to do the calculations for the steelwork—first for lack of time to do so themselves, and often because in some modern buildings, the steelwork was of so complicated a character that it was advisable and necessary to do so; but that did not alter the question of the position of the architect in the matter.

A good deal of stress has been laid upon the question of whether the steelwork should be designed, and quantities taken out by the consulting engineer before being sent to the constructional firms for estimates, or whether these firms should be allowed to do the calculations themselves. For contracts involving a large amount of steel work of a complicated character, the author agreed that a consulting engineer should be appointed by the architect, but there were many smaller works where this was not necessary, nor would the outlay of the building work warrant the expense incurred. It was quite satisfactory, given certain conditions, laid down, for the architect to send the drawings to several firms of engineers, and let them make their own calculations and quantities; but to enable the various contractors to estimate on the same basis, the following information must be given to each:

1. Plans of all floors showing the lines of all main girders and the positions of stanchions and columns; also a section or sections and outline elevation must be given.

2. The loads that each floor had to carry and whether live or total loads.

3. Whether British or foreign steel was to be used and whether the L. C. C. regulations under the General Powers Act, 1909, were to be complied with. If not, the stress should be specified that were to be worked to.

4. Whether price was to include for hoisting and fixing, or only for steelwork delivered to site.

5. If it was to be delivered unpainted, painted, or oiled, and if painted with what materials, and that all scales and rust must first be removed.

6. Workmanship, whether connections must be riveted or bolted and if the latter whether ordinary bolts would be allowed.

7. Whether the price was to include 10 per cent profit for the builders or only 2½ per cent cash discount.

The author's practice was to state the latter.

There was a diversity of opinion as to whether dead loads and superloads on a floor should be kept separate in making the calculation, or whether a load to include the dead weight of the floor itself, should be taken. The author's practice was to work to the latter, as the caculations were much simpler and the liability of error was materially reduced.

One must, of course, take into consideration the point loads which often occurred from partitions, etc. This was often neglected by competing firms of engineers, but of the concrete partition blocks on the market weighed a considerable amount, and one was often surprised when the weight was caculated out.

Another matter that he sometimes had to argue with the steel contractors was the central loading on girders carrying walls with openings and narrow piers between. Some assumed that the loads were evenly

distributed over the span through the brickwork below window sills. If the sills are very high up, this may be so, but in many cases the sills are only 12 in. or 18 in. above the girder, and in his opinion, the loading over a length of the girder equal to the width of the pier.

In calculating the loads on stanchions, etc., he did not take advantage of the reductions allowed by the 109 Act. He did not think it advisable, as buildings were often loaded to a greater extent than was allowed for. How often has an architect told that the floors will never have to carry more than a certain weight, and on going over the premises, when occupied, he is surprised to find these loads greatly exceeded.

When the various estimates and plans showing the steelwork were received the architect should carefully go through each set, and compare the sections of the girders, etc., and make rough calculations to check the sizes, and ascertain if the allowable stress had been adherred to. It was also necessary to check the depths of the joists in relation to the span, otherwise undue deflection might occur.

After the plans had been gone through, the architect was in a position to determine which estimate he would accept and when giving the general contractor instructions to accept the estimate it was important to state that all dimensions were to be taken from the site, and that the whole of the work was to be carried out to the architect's satisfaction, detail drawings of all parts to be submitted to him for approval.

The steel contractor must take his own dimensions from the site arranging of course with the general foreman which portion of the steel work was to be delivered first, and the order of delivery of the remaining consignments. When the cleared site had been measured with steel tapes and all angles carefully triangulated, it should be possible for engineers to set out and scale off the lengths of the various parts. The connections and workmanship were, in the author's opinion, very important matters to be considered and as far as his experience went, they did not always receive the attention that should be given them. Of what use was it to have a strong joist or stanchion if the cleats under the joist, or the joist under the stanchion were not properly designed, or if the design is correct the connections themselves were badly made. It was a regular practice to use ordinary bolts to take shear, such as the ordinary ¾-inch bolt in a 13-16-inch hole, the shank being threaded to within ¾-inch of the head. He has examined connections made in this way, and often out of five bolts in the connection four of them could be taken out with the fingers when the nut was removed. What amount of bearing area did one get on the threaded end of the bolt, supposing that the bolt was bearing on the plates. The bearing surface consists only of a series of knife edges. If bolts must be used in shear, then the holes must be carefully drilled concentric through all the plates without the usual amount of clearance, and bolts with plain shanks long enough to pass right through all of the plates should be driven in. In order to make sure of having no portion of the threaded end bearing on the outer plate a ¾-inch washer should be placed under the nut. I am aware that the 1909 Act says that rivets should be used in all cases where reasonably practicable, but there were a very large number of buildings to which this act did not apply. He thought that all steelwork should be designed in accordance with the provisions of the 1909 Act, but that the conditions for bolted work should be amplified in the act, the only requirement now being that the bolt should extend through the nut and the latter be secured so as to avoid risk of becoming loose Another important point, and one that was not always attended to, was that all holes through two or more thicknesses of metal should exactly coincide.

If they did not coincide, how could the rivets or bolts take a proper bearing and transmit the load from one to the other?

Filler joists in concrete floors should be bolted or cleated at least every third joist to the main beams. He had seen cases in which this was not done, but the fillers simply rested on short cleats on beams connected to stanchions running through three floors next the street, and with no other tie than that afforded by two ¾-inch bolts at each floor level; the end stanchion, built on the fact of the party wall with only 4½-inch brick casing around it, was not tied in at all. He believed it was becoming a common practice to place the smaller filler joists on a concrete haunching resting on the bottom flange of the main girder and not tied in any way to th egirder. In his opinion this method of construction should be condemned. The area of the stanchion base should be checked to see if the concrete was not loaded more than 12 tons to the square foot. Large gusset plates should not be allowed unless properly stiffened to prevent buckling. It was a good practice to encase the whole of the stanchion base right up to the floor line with concrete. This prevented rusting, and also held the floor of the stanchions. There was no difficulty in bedding both the template and stanchion and if the latter had to be grouted in the stone it might as well be absent. Girders supporting walls as well as main floor girders if they are formed of two or more plain I-beams side by side should have plates riveted on top and bottom. To simply bolt them together is, in his opinion, not sufficient, as the load from the main floor girders was not transferred to the outer joists, through some engineers think it is.

Caution must be observed in casting girders and stanchions with patent plasters, especially those that are stated to adhere without the intervention of any lathing. He had one in mind that corroded the steel to an alarming extent in a short time.

Stanchions and girders are best encased with fine Portland cement concrete, the steelwork having ⅛-inch wire wound round same, space about 12 inches apart. This held the concrete firmly in position and it was not easily damaged even by motors.

When he told them that he had seen specialist firms' own men sawing up timber for centering and the sawdust and shavings and small pieces of wood all left and mixed up with the concrete, he thought one's faith in trusting to such people was rudely shaken. One required a good clerk of words, well up in reinforced concrete construction, with several smart assistants under him, to look after the work.

In calculating the sizes of steel joists embedded in concrete the author's practice was to let the steel carry the load as an independent beam, but taking the depth of the beam anything up to 1-36 of the span, limiting the stress to 7½ tons per square inch. This was quite enough, and he often found that these small joists, such as 3 inches by 1⅛ inches and 4⅜ inches by 1¾ inches were of foreign make.

He had also had a preference for joists with 3-inch flanges over those with 1½-inch and 1¾-inch flange for the reason that the concrete had a much better bearing on the joist. He then uttered a warning against using breeze for floors. There was a great danger of expansian and he knew of several cases where this had occurred and pushed walls several inches out of upright, and even when the wall was rebult it happened again. There was also a corrosive action between the concrete and steel which in time might endanger the stability of the floor. The modern architect had to be a man of many parts, a jack-of-all-trades—a bricklayer, mason, carpenter, joiner, plumber and painter—always an artist, often a lawyer and last, but not least, a structural engineer.

ALL PIPING CONCEALED

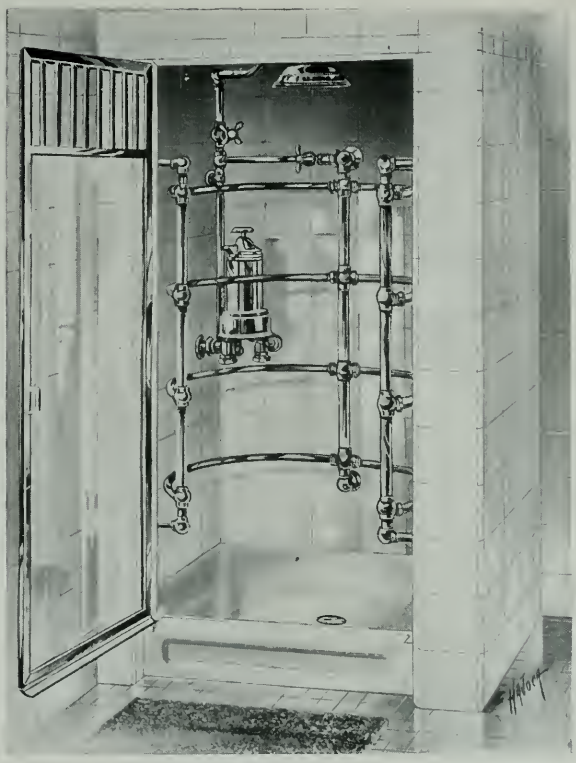
Shower Bathing in the Home*

By ARTHUR J. PHILLIPS

WITHIN the last thirty years shower bathing has grown remarkably in popular favor. Even in most moderate cost homes sanitary plumbing equipment is now not considered complete unless a modern shower bath is part of the sanitary installation. This progress is due in a certain measure to the popularity of tiled-in baths and the fact that such a bath makes an ideal receptor for the shower built into the wall above it. The demand for showers, however, is not wholly due to the construction features of the tiled-in bath, as important as that is. There is a more potent reason for the popularity of this form of bathing.

The shower bather has instinctively felt the physical and mental benefits derived from shower bathing, and that is the primary reason why makers of shower baths are increasing their output each year to meet the growing demand for showers. There is another reason recognized as important in shower bathing. It is quick and especially cleanly. Each drop of water fulfills its cleansing function and is gone. Furthermore, the morning bath

*Second of a series of special articles on Modern Sanitary Plumbing. Illustrations, courtesy of Haines, Jones & Cadbury Co. The third paper will appear in February.



THE "CIRCULAR" NEEDLE BATH

can be taken under a shower in the shortest possible time; in fact, while a bathtub may be filling the shower bather will have accomplished his "matutinal ablutions," as our English cousin terms his morning bath.

It must not be conceded, however, that the shower bath will ever displace the bathtub. The two forms will be indispensable in the home. The soothing effects of a hot tubbing has become too engrained in the bather's mind for him to relinquish the therapeutic pleasure of the tub. Furthermore, some persons are so constituted physically that shower bathing would be detrimental to their physical well being, rather than otherwise.

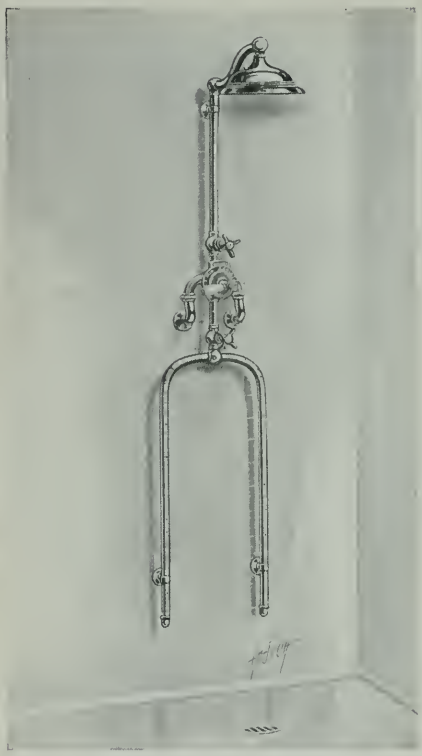
For the person in normal health, however, shower bathing possesses distinct advantages. It provokes thermic and mechanical stimulation of the nerves, blood vessels and muscles, stimulating the circulation and skin, and producing physical and mental refreshment from this physiological action. Some interesting tests have been made relative to the effect of shower baths on energy. Two Italian scientists, Vinaj and Maggiora, observed that the power of the middle finger of one of their subjects to raise a small weight was trebled after a bath reducing gradually from cool to cold. They observed the lowering of muscular capacity after a tepid or warm bath, but a slight increase in strength after a hot bath with friction as in a strong

SIMPLE, BUT LUXURIOUS

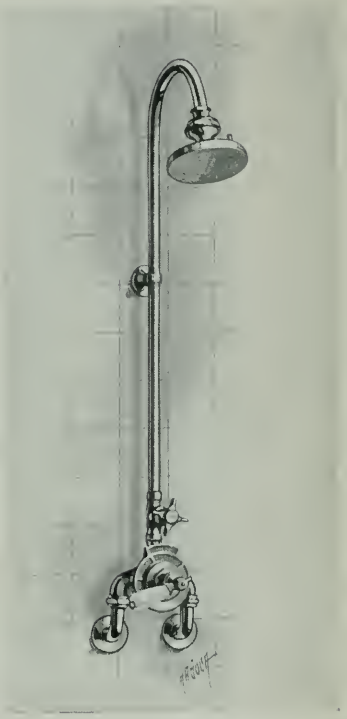
shower. For muscular soreness there is no better remedy than a hot shower bath in which the soreness vanishes as if by magic.

In designing showers the best makers have kept pace with the latest discoveries in science and to induce the physical stimulation and nervous reaction so beneficial to the bather recommend certain types of showers as best suited for such requirements. The needle bath and overhead shower is highly in favor as a most satisfactory design. A decided preference has been displayed for rose spray needle baths, as shown in the first illustration. These sprays range from shoulder height to knee height and the top row installed with adjustable ball joints so the spray is deflected downward from the shoulder.

Where space and other building conditions permit the tiled shower enclosure with a plate glass door and Regal porcelain receptor makes an ideal installation. The door and receptor are so designed that every drop of water is kept within the enclosure, and no stray or random drops can get outside to dampen or wet the rest of the bathroom. With this form of enclosure it is desirable to have a ventilating grill at the top to provide for air circulation and escape for vapor which may accumulate during a hot bath.



THE COMBINATION "OVERHEAD AND HORSESHOE" NEEDLE



IDEAL FOR SCHOOLS AND GYMNASIUM

To provide ample room for the bather, such enclosures are made either 38 by 38 inches, or where the Regal porcelain receptor is used 39 by 40 inches. In an enclosure of these dimensions the bather will find plenty of elbow room and ample space for the various needle streams to strike the body with exhilirating results. When the enclosure is constructed of marble, it is desirable to use under the marble floor slab a lead pan with its sides well up within the sides and sills of the enclosure and a lead pipe running therefrom to a tell-tale in the basement. This pan will catch any seepage draining through the joints and prevent damage to any ceiling underneath.

By many, the thermostat mixing valve is considered an indispensable feature in a modern shower enclosure, and is therefore being extensively installed in both private homes and public institutions. This device enables each bather to set the valve so that it delivers water at a prescribed temperature, thus preventing any possibility of scalding or chilling. As shown in the first illustration, such a shower is usually equipped with a small test nozzle just above the receptor, so that the bather before getting under the shower may test the temperature by allowing a small trickle to run through the test tube on to the foot.

Sometimes tiled-in shower enclosures are desired equipped merely with the overhead shower and a mixing valve and without the needle bath. Such a design is illustrated here.

Whenever a smaller needle shower is desired, the single horseshoe type will prove a very satisfactory design. Such a shower is proving very popular for use over tiled-in bathtubs, as well as in shower enclosures. Like the regular circular needle bath, the needle horse shoe and shower head are controlled by two independent valves, both supplied from one mixing valve. The bather may take either a needle bath or an overhead shower, or both simultaneously.

Another extremely popular type of shower for homes, clubs and hotels is equipped with a rain shower head on an adjustable ball joint and mixing valve. The head throws a fine rain-like spray and the adjustable ball joint enables the bather to arrange the shower head so that the stream may be deflected from the shoulder down when it is desired to take a bath without wetting the hair. This design may be installed on the wall, as shown, or in the wall when used with tiled-in bath.

To operate successfully large circular needle baths and overhead showers there should be at least twenty-five pounds water pressure, with an ample volume of supply, and the supply pipes to the shower valve should be one inch in diameter. Single horse shoe needle baths can be operated with this pressure and three-quarter inch supplies. Overhead rain showers are successfully operated through half-inch supply pipes, although there may be pressure, volume and piping conditions where the above general rules may need modification.

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New Laws Governing Construction Work in California

By J. J. ROSEDALE, Construction Engineer

AT THE last session of the legislature, the following four laws governing construction work were passed and are now in effect and being enforced by the department of safety of the Industrial Accident Commission:

The use of dangerous equipment and false work is a misdemeanor.

Section 402 (c) of the Penal Code (Chapter 55), provides that any person employing another to perform any labor in the construction, alteration, repairing, painting or cleaning of any building or other structure within this state, who furnishes or erects, or causes to be furnished or erected for the performance of such labor, unsafe or improper scaffolding, slings, hammers, blocks, pulleys, stays, braces, ladders, irons, ropes or other mechanical contrivances, or who hinders or obstructs any officer or inspector of the Industrial Accident Commission attempting to inspect the same under the provisions of any statute of the State of California or safety order of the Industrial Accident Commission, or who destroys or defaces, or removes any notice posted thereon by any such officer or inspector, or permits the use thereof, after the same has been declared unsafe, by such officer or inspector, contrary to the provisions of said acts or orders, shall be guilty of a misdemeanor.

Elevators used in buildings during the course of construction must be made safe.

Chapter 332, Laws of 1921, provides that every hoist used in buildings during the course of construction must have an adequate system of signals as provided in the General Construction Safety Orders issued by the Industrial Accident Commission. This act further provides that hoists must be properly constructed so as not to endanger the lives of employees working in the immediate vicinity of such hoists.

All scaffolds ten feet above the ground must have safety railings.

Chapter 333, Laws of 1921, provides that all scaffolding or staging suspended from an overhead support more than ten feet from the ground or floor shall have a safety rail of rigid material and of sufficient strength to protect workmen from falling. Any and all parts of such scaffolding shall be of sufficient strength to support, bear or withstand with safety, any weight of persons, tools, appliances or materials that may be placed thereupon or that are to be supported thereby while such scaffolding is being used. The Industrial Accident Commission of the State of California is authorized to make and enforce safety orders to supplement and carry into effect the purposes and provisions of this act.

Temporary floors to protect workmen from falling and from being hit by falling materials.

Chapter 334, Laws of 1921, provides that any building more than two stories high in the course of construction shall have the joists, beams or girders of every other floor or level where any work is being done, or about to be done, covered with flooring laid close together, to protect workmen engaged in such building from falling through joists or girders, and from falling planks, bricks, rivets, tools, or any other substance, whereby life and limb are endangered. The floors in reinforced concrete buildings must be constructed before the commencement of work upon the walls of the second floor above. Buildings having wooden floors, other than steel frame buildings, must have the underflooring, if double flooring is to be used, laid on each floor before commencement of work upon the walls of the second floor above. Where single wooden floors are to be used, each floor shall be planked over before the commencement of work upon the floor of the next floor above.

Buildings of structural frame of iron or steel shall have the entire floor of every second story, except such spaces as may reasonably be required for the proper construction of such buildings, thoroughly covered with planks tightly laid together, so that workmen shall have at all times planked floors within two stories below them.

Where spans between beams in steel frame buildings exceed thirteen feet, intermediate beams must be used to support the temporary flooring; provided, however, that spans not exceeding sixteen feet may be covered by three-inch planks without such beams. When intermediate beams are used, they shall be of sufficient strength to sustain live loads of fifty pounds per square foot of the areas supported.

Intermediate flooring or safety nets must be provided in all buildings where the distance between planked floors exceeds twenty-five feet.

When the steel columns in buildings are spliced at every story, the erection gang must in no case be more than two stories distant from the riveting gang. If the columns are spliced every second or third story, the erection gang must in no case be more than four stories distant from the riveting gang.

Planked floors must consist of planks tightly laid together of number one common lumber, not less than two inches thick and eight inches wide, free from protruding nails or other objects. Nets shall consist of at least one and one-half inch manila rope with three-quarter inch borders, and four by four inch mesh. The borders of the nets shall be provided with loops so that they can be readily combined or attached to convenient points on the structural frame.

The act provides that no owner, agent of the owner, general contractor, contractor, subcontractor, or other person shall proceed with any work assigned to or undertaken by him, or require or permit any other person to proceed with work assigned to or undertaken by either, unless the planking or nets required by this act are in place. Violation of this section shall constitute a misdemeanor.

* * *

Good Paint Best Medicine for Unprotected Surfaces

By C. A. STEDMAN

"SAVE the Surface" is a slogan which has become pretty well impressed upon the minds of our thinking people during the last year and a half. It was born of an idea—a great idea—that of preventing property depreciation via the surface route.

Premature decomposition of surfaces is the dilemma which "save the surface" seeks to avoid. When this campaign to protect surfaces was pro-

jected, it was pointed out that about three times as many dollars in property losses were incurred each year in the United States from preventable decay as from fire; and yet the amount paid in premiums for protection against fire, exceeded the amount paid for protection against decay (paint purchases) in about the same proportion.

Manifestly, the "save the surface" argument is sound. It is economic. In these post-war days when property owners are beginning to feel the burden of decreased profits, a prescription for saving the surface is distinctly acceptable.

But—

How best to do the job! The subject reverts to a discussion of quality paints, since the preferred prescription that is to cure the patient must contain efficacious medicine.

Now, coming down to greater detail, we find that those paints containing the proper proportion of zinc oxide are the indicated medicines. And venturing onto the technical, we reason that zinc oxide, being of extremely fine particle size, when mixed with the proper oil, penetrates into the minute pores of the surface. This assures firm anchorage and furnishes protection to that surface against the elements, the agency that destroys.

This discussion does not contemplate the use of zinc oxide to the exclusion of other materials. It urges only a partnership between zinc and other properly selected pigments. As the physician and the nurse operate in the treatment of their sick patient, so does each pigment have certain duties to perform in its fight against an unseen, inanimate foe.

One of the foremost master painters of this country has said of zinc: "Zinc is the reinforcing element that overcomes the weak points of lead, the two, in combination, form the ideal paint film."

Speaking of zinc, used for exterior and interior painting the world over, some of its functions when used in paint are these:

1. It retards chalking.
2. Reduces fading or discoloration.
3. Insures smooth, clean surface.
4. Imparts permanence, or durability, to the coating.

So, it is seen that when quality paints are prescribed to "doctor" up the residence, barn, silo, hen-coop or other urban, suburban or rural edifice, it may be regarded as certain that not the least important of the ingredients contained is zinc oxide, not always heard about, but a factor not to be overlooked in the campaign being waged against the ravages of time and weather.

* * *

Effective Furniture Arrangement

It is a mistake to suppose that an effective furniture arrangement depends either on a striking color scheme or emphasis of any one period. It is considered good taste by the majority of interior decorators, to combine a number of pieces of different styles if they are sympathetic in line. When placed in harmonious relation, one to another, they create a graceful and balanced grouping for a small room. The dining room is the single exception to the above rule. Here, where family and friends meet in the intimate confidences that make our home life particularly interesting, no small amount of formal dignity and characteristic refinement is demanded by discriminating people in the better homes.

The Status of Zoning in Cities of the United States*

THE following is a list of the cities in which zoning is in effect:

CITY	DATE OF ADOPTION OF ORDINANCE	CONSULTANT
Alameda, Calif.	1919	Charles H. Cheney.
Berkeley, Calif.	July, 1920; conf. by pop. vote, 1921	Charles H. Cheney.
Brockton, Mass.	November 29, 1920	Arthur C. Comey.
Caldwell, N. J.	September 19, 1921	George B. Ford.
Cleveland Heights, O.	August 2, 1921	Robert. H. Whitten.
Cliffside Park, N. J.	September 27, 1920	Herbert S. Swan.
Coronado, Calif.	February, 1921.	
Cudahy, Wis.	July 16, 1919.	
East Cleveland, O.	1919	Robert H. Whitten.
East Orange, N. J.	March 16, 1921	George B. Ford.
Evanston, Ill.	January 18, 1921	Harland Bartholomew.
Glencoe, Ill.	May 9, 1921.	
Glenridge, N. J.		Herbert S. Swan.
Gloversville, N. Y.	April 11, 1921	E. E. Christopher.
Los Angeles, Calif.	1909, etc.	
Maplewood, N. J.	1921	Frank B. Williams.
Milwaukee, Wis.	November 15, 1920	Arthur C. Comey.
Montclair, N. J.	May, 1921	Herbert S. Swan.
Nenah, Wis.	May 5, 1915.	
Newark, N. J.	January 3, 1920	Herbert S. Swan.
New York City, N. Y.	July 25, 1916	George B. Ford.
Niagara Falls, N. Y.	1920	John Nolen.
Oakland, Calif.	April, 1919.	
Omaha, Neb.	June 29, 1920	Harland Bartholomew.
Palo Alto, Calif.	August 16, 1918	Charles H. Cheney.
Pasadena, Calif.	October 1, 1919.	
Pomona, Calif.	March, 1917, and April, 1920.	
Racine, Wis.	October 3, 1916.	
Rahway, N. J.	August 11, 1920.	
Rochester, N. Y.	September 22, 1919	E. A. Fisher.
Sacramento, Calif.	June 12, 1917.	
San Francisco, Calif.	October 3, 1921.	
St. Louis, Mo.	May, 1918	Harland Bartholomew.
Santa Barbara, Calif.	May, 1920.	
South Orange, N. J.	1921	George B. Ford.
South Pasadena, Calif.	September, 1920.	
Tacoma, Wash.	June 4, 1919.	
Turlock, Calif.	1918	Charles H. Cheney.
Washington, D. C.	August 30, 1920	Harland Bartholomew.
Westfield, N. J.	August, 1921	George B. Ford.
West Orange, N. J.	September 19, 1921	George B. Ford.
White Plains, N. Y.	June 7, 1920	Herbert S. Swan.
Yonkers, N. Y.	1920	Herbert S. Swan.

The following is a list of the cities in which zoning regulations are in progress:

CITY	DATE OF ADOPTION OF ORDINANCE	CONSULTANT
Atlanta, Ga.	Plans in progress	Robert H. Whitten.
Buffalo, N. Y.	Plans in progress.	
Chicago, Ill.	Commission appointed July 22, 1921.	
Cincinnati, O.	Studies just begun	George B. Ford.
Cleveland, O.	Ordinance prepared	Robert H. Whitten.
Dallas, Texas	Ordinance prepared	Robert H. Whitten.
Detroit, Mich.	Ordinance prepared	Harland Bartholomew.
Elizabeth, N. J.	Ordinance prepared	George B. Ford.
Gary, Ind.	Plans in progress	Edward H. Bennett.
Grand Rapids, Mich.	Plans nearly ready	Harland Bartholomew.
Hamilton, O.	Ordinance prepared	Harland Bartholomew.
Hoboken, N. J.	Ordinance prepared	Herbert S. Swan.
Hutchinson, Kans.	Ordinance prepared	Harland Bartholomew.
Lakewood, O.	Ordinance prepared	Robert H. Whitten.
Lincoln, Neb.	Just starting.	
Long Beach, Calif.	Ordinance in preparation	Charles H. Cheney.

*Republished from Chicago City Club Bulletin of September 19. Compiled by Charles B. Ball, with corrections and additions.

CITY	DATE OF ADOPTION OF ORDINANCE	CONSULTANT
Madison, Wis.	Plans nearly ready	Harland Bartholomew.
Memphis, Tenn.	Plans nearly ready	Harland Bartholomew.
Minneapolis, Minn.	Ordinance prepared	George B. Ford.
Orange, N. J.	Ordinance prepared	George B. Ford.
Paso Robles, Calif.	Ordinance in preparation	Charles H. Cheney.
Paterson, N. J.	Hearings in progress	Herbert S. Swan.
Philadelphia, Pa.	Ordinance failed to pass, 1920	Chester W. Albright.
Phoenix, Ariz.	Plans in progress	Edward H. Bennett.
Pittsburg, Pa.	Ordinance prepared	Harland Bartholomew.
Portland, Ore.	Ordinance defeated on ref., 1920	Charles H. Cheney.
Rock Island, Ill.	Plans in progress	Edward H. Bennett.
Rutherford, N. J.	Plans nearly ready	George B. Ford.
St. Paul, Minn.	Plans nearly ready	Edward H. Bennett.
San Francisco, Calif.	Ordinance in preparation.	
Spokane, Wash.	Ordinance completed	Charles H. Cheney.
Springfield, Mass.	Studies just begun	George B. Ford.
Toledo, O.	Commission at work.	
Tarrytown, N. Y.	Ordinance prepared	George B. Ford.
Troy, N. Y.	Studies just begun	George B. Ford.
Wichita, Kans.	Plans nearly ready	Harland Bartholomew.
Wilmette, Ill.	Ordinance prepared.	
Winnetka, Ill.	Ordinance prepared	Harland Bartholomew.

* * *

Will Take 5 Years to Overcome Nation's House Shortage

THE housing shortage in this country will not be overcome within the next five years, even with the best of good fortune. This statement was made by Mr. John Ihlder, manager of the Civic Development Department of the Chamber of Commerce of the United States, before the recent housing conference of the American Society of Civil Engineers held in New York City.

Mr. Ihlder said that even the well-to-do would not be as adequately provided with good housing in 1927 as they were in 1914.

"As for the wage-earner, let alone the poor, their problem will be with us a good deal longer," he said. "Consequently it is part of common sense to base our proposals on the proposition that the campaign will be long continued and that whatever is to produce results must be economically sound." Mr. Ihlder pronounced as dangerous some of the so-called "emergency" housing legislation. He pointed out that during the last two years there has been legislation not based upon any deep study, and designed merely to check, temporarily, certain abuses from which a vocal part of the community is suffering. Legislation designed, not to cure, but simply to reduce irritation, he said, is likely to have effects quite unlooked for.

Mr. Ihlder explained that during the war he was an advocate of government housing for war workers.

"That was a time of real emergency and it had a definite terminal point, the end of the war," he said. "Today the situation is fundamentally different. What we do now has no definite terminal point. Any date we may set is easily changed. What we do now sets precedents, establishes a habit of mind which will carry on. So it is important that our precedents, our habits of mind, have in them the possibility of continued growth and development. Adequate and good housing must pay a fair return on the investment. Only so can we be assured of enough good, new housing to meet our growing needs and our rising standards."

Speaking of building costs, Mr. Ihlder said that "so far as experience goes, such short cuts to the millennium as government building and management do not promise to reduce real costs. Government operation, not only in this country but in others whose distance gives a haze of enchantment, has, as a rule, proved clumsy, inefficient, and expensive. Certain functions must necessarily be performed by government, but the burden of proof is always on those who would transfer new functions to the government. So far, proof is lacking that governmental construction or management of housing would produce better or as good results in America as would private."

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PUT OVER THE GREAT PLAN FOR SAN FRANCISCO

Mr. Willis Polk has written a letter to Mr. Jno. A. McGregor congratulating him on his election as member of the San Francisco Board of Supervisors and expressing confidence for the future of San Francisco because of Mr. McGregor's election. Mr. Polk trusts that the supervisor will find practical means for realizing the Chamber of Commerce's plan for the industrial development of San Francisco, as prepared by Dr. B. M. Rastall.

Mr. Polk suggests that a meeting in furtherance of the Rastall plan, under the auspices of the city, be held at an early date, and that the attendance by invitation of Mr. Charles H. Wacker, chairman of the Chicago Plan Committee, and Mr. Edward H. Bennett, successor of the late D. H. Burnham, in city planning projects, be secured.

At this meeting, ideals sought for by Dr. Rastall could be made clear and the experience of Chicago and other cities in overcoming opposition be explained. No doubt, as a result of such a meeting, great progress could be made toward a realization of a truly great plan for our city.

A city beautiful need not mean an increased tax rate—it would only mean such an added increment of wealth as would reduce, rather than increase, the individual's contribution of taxes, and permit all to participate in the city's welfare.

Pericles, not for art's sake, but as a matter of pure statesmanship, made Athens beautiful, and for two thousand years the world has paid tribute to Greece.

That great, elusive, ever-sought-after quality, artistic charm, must not be missing.

As Mr. Burnham said: "Make no little plans; they have no magic to stir men's blood, and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency. Remember that our sons and grandsons are going to do things that would stagger us, let your watchword be order and your beacon beauty."

Notes and Comments

Jail Sentences for Violators of the Sherman Act

Sentences of imprisonment, with fines of $4,000 each, assessed against four of seventy defendants before Federal Judge Van Fleet in New Jersey on charges of violating the Sherman act in connection with the sale of building tile will result, it is believed, in renewed effort to bring convictions in instances where it has been found that arbitrary practices have served to increase the housing shortage, or prevent the prompt resumption of building and construction work since the war.

The action of Judge Van Fleet in imposing prison sentences — the first since the Sherman law was passed in 1890—was unexpected even by the government prosecutors, and was a surprise to the officials of the Department of Justice. Several cases of similar aspect to that tried before Judge Van Fleet are pending in the federal courts, and these will be pushed with new energy, it is asserted.

The fines and prison sentences imposed by Judge Van Fleet were against four of the members of the Tile, Grate and Mantle Manufacturers' and Dealers' Association in New York. They had previously entered a plea of guilt under section 1 of the Sherman law. Twenty-nine other defendants were fined sums of $500 to $5,000, while eleven corporations were fined $4,000 each, and six other corporations sums of $500 to $2,500.

Officials of the Department of Justice attach great importance to the statement of Judge Van Fleet in imposing sentence on the defendants, particularly his declaration that perhaps there has not been a more important prosecution brought under the Sherman act than the one then before him. After reviewing the acute housing shortage in 1920, he said:

"While the primary cause of these conditions was perhaps largely the outgrowth of the World War, and while in a large measure doubtless the rent profiteer contributed to the hardship, there can be no question but that this situation was aggravated in grave measure by certain unlawful combinations among groups of men engaged in the business of supplying building material of the character with which we are here dealing."

Revised Chimney Ordinance for Municipalities

According to information recently sent out by the National Board of Fire Underwriters, 76 William street, New York, the records of the past five years, covering the whole United States, show that defective chimneys and flues rank fourth in the list of most prolific causes of fire. Hence the need for correcting this great evil is quite apparent. It is a scourge which affects cities, hamlets, and isolated buildings alike, and imperils both life and property, yet the remedy is simple and inexpensive, as compared to the risk involved .

The National Board has just finished revision of the chimney ordinance, which has had thorough consideration and discussion by various technical organizations, architects and engineers, who have cooperated generously in an endeavor to frame requirements which would not only produce a fire-safe chimney, but would also furnish satisfactory draft under all conditions.

A lack of intelligent consideration of this latter feature of chimney flue construction in the past is claimed by heating engineers and manufacturers of heating devices to be a source of unending trouble and expense.

The ordinance now bears the endorsement of twelve national organizations interested in the subject, and this is evidence that as thus submitted it conforms reasonably with the mature ideas of the numerous experts who have cooperated in the revision.

Lead Too Pure for Cathedral Roofing

There is such a thing as too pure lead for roofing purposes. The ancient Gothic cathedrals of Europe were topped with this grey metal that blended well with the stone work and the style of architecture.

Lead was the metal that was specified for the roof of the Episcopal Cathedral of Washington, which is now being built, but after it had been applied for some time, it was found that sheet lead on the steep roof slopes had a tendency to flow downward under its own weight and the heat of the sun. The nail holes enlarged and allowed the metal to slip partially off.

Metallurgists of the Bureau of Standards of the Department of Commerce were called upon and

(Concluded on page 125)

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With the Architects

Building Reports and Personal Mention of Interest to the Profession

Newsom & Newsom Have Much Work

The new year started in well with the architectural firm of Sidney B. and Noble Newsom, Nevada Bank building, San Francisco. This firm has completed plans for a large 12-room Spanish type residence to be built in Piedmont, for Mr. Chas. C. Keeney, at a cost of $32,000, and they have also made plans for a $22,000 12-room home in Crocker Highlands, Oakland, for Mr. G. T. Henshaw. Other work includes a three-story frame apartment house to be built in San Francisco, at an estimated cost of $20,000, for Mr. George Wahlheim. Plans have been completed for alterations and additions to the Oakland Baseball Park, and plans are on the board for a $9,000 residence in Thousand Oaks to be built of native rock.

Nine-story Office Building

Architects Reid Bros., California-Pacific building, San Francisco, are completing working drawings for a nine-story Class A store and office building for Mr. William Fitzhugh, at Post and Powell streets, San Francisco. This is the site of the proposed Loew theatre, construction of which was abandoned several months ago. The new building will contain 192 offices and a number of small stores and will represent a probable expenditure of at least $750,000.

Five-story Apartment House

Architect B. G. McDougall, 381 Bush street, San Francisco, has completed plans and taken bids for a five-story Class C reinforced concrete apartment house to be erected at Bush and Taylor streets, for Bertha Vasye, at an estimated cost of $50,000. Mr. McDougall has also completed plans for a $30,000 residence to be erected in Claremont Court, Berkeley, for Mr. J. D. Havre.

Apartments and Residence

Architect Houghton Sawyer, Hearst building, San Francisco, has completed plans for a three-story and basement frame and stucco apartment house to be erected on Vallejo street, near Taylor, San Francisco, for Mr. G. M. Hyde. Mr. Sawyer has also completed plans for an eight-room residence on Falcon place, San Francisco, for Mr. A. L. Bertini.

Kuhn & Edwards Busy

Architects Alfred Kuhn and Thomas M. Edwards, associated, with offices in the Commercial building, San Francisco, are preparing plans for a one-story reinforced concrete store building, 80 x 110, to be erected at Burlingame, at a cost of $35,000, also a two-story frame residence in the same town. They report having awarded contracts at $15,000 for a two-story reinforced concrete store and apartment building at Burlingame for Mr. A. L. Offield, and a two-story store and apartment building in the same town, for Mr. Lewis Rebele, for $12,000.

Architect Baumann Busy

New work in the office of Achitect H. C. Baumann, 251 Kearny street, San Francisco, includes a two-story reinforced concrete store and loft building for Mr. Herman Rumpf on Howard street, between First and Second streets, San Francisco, to cost $35,000; a one-story frame battery service station at Seventh avenue and Geary street, to cost $10,000; a two-story frame residence on Forty-fourth avenue and Balboa street, for Mr. M. Person, and two frame dwellings at Seacliff, for Mr. Leory Shay, to cost $12,000 each.

Mr. C. F. Hoffman to Build Apartments

Mr. C. F. Hoffman, of the Golden Gate Iron Works, 1541 Howard street, San Francisco, has had plans prepared for a three-story Class C apartment house, the first floor of which will have a steel frame, to be erected on the southeast corner of Lake street and Twelfth avenue, San Francisco. There will be nine apartments of five rooms each. Mr. C. O. Clausen, the architect, estimates the cost at $55,000.

Another Berkeley Store Building

Contracts were let the past month by Architect James W. Plachek for another store building to be erected in the business section of Berkeley, at an approximate cost of $40,000. This is the third store building planned by Mr. Plachek within the last sixty days. The owner is Blanche L. Porter and the location is opposite the Masonic Temple, at Bancroft and Shattuck avenues.

Some Big Building Projects for Los Angeles This Year

Following are some of the more important building projects announced for Los Angeles and Southern California this year:

Class A hotel building, 12 stories, 360x165 ft., 1000 rooms, southwest corner of Fifth and Olive Sts.; Biltmore Hotel Co., owner; Schultz & Weaver, 17 E. Forty-ninth St., New York City, architects; plans being prepared. Estimated cost about $4,000,000.

Fifth Street department store building, 11 stories, steel frame, 167x164 ft., southwest corner Fifth and Broadway; Faris-Walker Co., owners; Aleck E. Curlett, Merchants' National Bank Bldg., architect. Building will be erected in three units; excavation for first unit about completed; Clinton Construction Co., general contractors. Estimated cost, $1,250,000.

Reinforced concrete office building, 12 stories, 50x155 ft., southwest corner Eighth and Spring Sts.; W. W. Paden and C. H. Price, owners; Roy L. Smith, Higgins Bldg., architect; plans being prepared. Estimated cost, $500,000.

Central public library building, Normal Hill Center; Bertram Goodhue, New York City, and Charleton M. Winslow, Van Nuys Bldg., Los Angeles, associated architects. Plans being prepared. Estimated cost, $1,500,000.

Reinforced concrete office building, 3 stories, 267x207 ft., southwest corner of Adams and Figueroa Sts.; Automobile Club of Southern California, owner; Hunt & Burns, Laughlin Bldg., architects. Foundation and first floor constructed; contract for superstructure just let to C. J. Kubach Co., Merchants National Bank Bldg. Estimated cost, $500,000.

Class A, steel frame, church, southwest corner Eighth and Hope Sts.; First Methodist Episcopal Church, owner; John C. Austin, Baker-Detwiler Bldg., architect; steel ordered and contract for foundation let to Wm. Simpson Constr. Co. Estimated cost, $500,000.

Stadium, reinforced concrete, seating capacity 75,000, Exposition Park; Community Development Association, owner; John Parkinson and Donald Parkinson, Title Insurance Bldg., architects; Edwards, Wildey & Dixon Co., Black Bldg., general contractors; excavation started. Cost, $800,000.

Stadium, reinforced concrete, seating capacity 65,000, Pasadena; Tournament of Roses Association, owner; Myron Hunt, Hibernian Bldg., Los Angeles, architect. Plans prepared. Estimated cost, $350,000.

Class A office building, steel frame, 6 stories, 132x120 ft., Ocean Ave., Long Beach; Seaside Water Co., owner; John C. Austin, Baker-Detwiler Bldg., Los Angeles, architect. Plans now being prepared. Estimated cost, $400,000.

Two dormitories, hospital, dining room, etc., reinforced concrete construction, Boyle Ave.; buildings 2 stories and basement, 60x150 ft. and 50x120 ft.; Hollenbeck Home, owner; Morgan, Walls & Morgan, Van Nuys Bldg., architects. Plans prepared; work started. Estimated cost, $300,000.

Hollywood branch public library building; W. J. Dodd and Wm. Richards, Brackshops Bldg., architects. Plans being prepared. Estimated cost $80,000.

Shrine auditorium, Class A construction, steel and concrete, to accommodate about 5000, Jefferson and Royal Sts.; Al Malaikah Temple, owner; John C. Austin, Baker-Detwiler Bldg., and A. M. Edelman, H. W. Heilman Bldg., associated architects. Working plans are being prepared. Estimated cost, $1,000,000.

Reinforced concrete hospital buildings, Santa Barbara; St. Francis Hospital, owner; E. L. Mayberry, Pacific Electric Bldg., Los Angeles, and Pool, Kirkhuff & Schaaf, Santa Barbara, associated architects; contract just awarded to J. Y. Parker, Santa Barbara. Cost, $215,000.

Church at Harvard and Louise Sts., Glendale; Glendale Presbyterian Church, owner; Robert H. Orr, Van Nuys Bldg., Los Angeles, architect; plans practically completed. Estimated cost, $200,000.

Church at Melrose Ave. and Berendo St., Los Angeles; Melrose Ave. Methodist Church owner; Robert H. Orr, Van Nuys Bldg., architect. Preliminary plans made. Estimated cost, $300,000.

Church on Morgan Place, near Hollywood Blvd., Los Angeles; Hollywood Christian Church, owner; Robert H. Orr, Van Nuys Bldg., architect. Plans being prepared. Estimated cost, $150,000.

Church at Whittier; Christian Church, owner; Robert H. Orr, Van Nuys Bldg., Los Angeles, architect; plans being prepared. Estimated cost, $75,000.

Church at Pasadena; Baptist Church, owner; Robert H. Orr, Van Nuys Bldg., Los Angeles, architect. Plans being prepared. Estimated cost, $100,000.

County jail at Santa Ana, 4 stories and basement, 100x125 ft., reinforced concrete; Orange county, owner; John Parkinson and Donald Parkinson, Los Angeles, architects. Bids now being taken. Estimated cost, $175,000.

Class A church buildings, Figueroa and West Adams Sts.; St. Johns Episcopal Church, owner; Pierpont and Walter S. Davis, 3215 W. Sixth St., architects. Preliminary plans made. Estimated cost, $200,000.

Reinforced concrete church, Tenth and Figueroa Sts.; Immanuel Presbyterian Church, owner; C. F. Skilling, Bradbury Bldg., architect. Plans now being prepared. Estimated cost, $500,000. Sunday school unit, cost $200,000, to be started first.

Brick church, Third and Arizona Sts., Santa Monica; First Presbyterian Church of Santa Monica, owner; C. F. Skilling, Bradbury Bldg., Los Angeles, architect. Working plans now being completed. Estimated cost, $100,000.

Class A lodge and club building, 12 stories, 175x170 ft., northwest corner Eighth and Flower Sts.; Los Angeles Lodge of Elks, No. 99, owner; Edwin Bergstrom, Citizens National Bank Bldg., architect. Preliminary sketches made. Estimated cost, $1,500,000.

Reinforced concrete loft building, 4 stories, 52x118 ft., Seventh St. between Grand and Olive; Brock & Co., owners; W. J. Dodd and Wm. Richards, Brackshop Bldg., architects; Scofield Engineering Construction Co., general contractors; excavation started. Estimated cost, $175,000.

Reinforced concrete general freight office building, 2 stories and basement, 80x200 ft., Hunter St., between Lemon and Alameda; Union Pacific Railway Co., owner; John Parkinson and Donald Parkinson, Title Insurance Bldg., architects. Freight shed, 50x600 ft. and terminal improvements included in this project. Bids now being taken. Total estimated cost, $250,000.

Reinforced concrete hotel, 7 stories, 50x150 ft., southwest corner Cedar Ave. and Broadway, Long Beach; Omar H. Hubbard, owner; John Parkinson and Donald Parkinson, Title Insurance Bldg., architects. Plans being prepared. Estimated cost, $400,000.

Alter Stockton Building

Architect B. J. Joseph, Call building, San Francisco, is preparing plans for extensive alterations to a four-story store and office building at Main and Hunter streets, Stockton, owned by N. Levi & Bros.

Mutual Loan Building

Architects Binder & Curtis of San Jose are preparing plans for a two-story bank and office building to be erected on South First street, San Jose, for the Mutual Building & Loan Association, to cost $35,000.

Commissioned to Prepare Plans

Architects Wyckoff & White, Growers Bank building, San Jose, have been commissioned to prepared plans for a $100,000 grammar school building at Los Gatos.

Personal

Messrs. George E. Gable and C. Stanley Wyant have opened offices for the practice of architecture at 634 So. Western avenue, Los Angeles, under the firm name of Gable & Wyant, architects, and desire to receive manufacturers' catalogues and samples.

Prof. John Wm. Gregg, of the University of California, and Mr. Frederick N. Evans, Superintendent of Parks, Sacramento, have been elected into membership of the Pacific Coast Chapter of the American Society of Landscape Architects.

Architect Elmer Grey, who has been seriously ill for several weeks, is recuperating at Carmel and expects to return to Los Angeles shortly. His work is being ably cared for by Mr. A. W. Hawes, his chief draftsman.

Architects Montgomery & Nibecker have dissolved partnership, Mr. Montgomery retaining the office at 622 Story building, Los Angeles. Mr. A. S. Nibecker, Jr., has established an office at 421 Washington building.

Architect Roy J. Kieffer has opened offices at 218 Wilshire building, Los Angeles, and desires a complete file of catalogs and samples of building material and equipment.

Messrs. H. D. Charlton and C. H. Brainard are now associated for the practice of architecture with offices at 113 E. Broadway, Glendale.

Architect Arthur W. Angle has moved his office to larger quarters at 325 H. W. Hellman building, Los Angeles.

Prizes of Rome in Architecture, Sculpture and Painting Announced

The American Academy in Rome announces its annual competitions for fellowships in architecture, sculpture and painting. They are each for a term of three years with a stipend of $3,000.00, with opportunity for travel. Studio and residence at the academy are provided free of charge and board at cost. The competitions, which will be held in various institutions throughout the country and will probably begin in late March or early April, are open to all unmarried men, citizens of the United States. Entries will be received until March 1. Any one interested should apply for detailed circular of information and application blank to Roscoe Guernsey, executive secretary, American Academy in Rome, 101 Park avenue, New York, N. Y.

San Francisco Residence

Mrs. L. Martin has had plans prepared by Architect M. V. Politeo, First National Bank building, San Francisco, for the construction of a two-story frame and plaster residence and garage at Seacliff, estimated to cost $30,000.

New Offices of Los Angeles Chapter, A. I. A.

Mr. Sumner P. Hunt was unanimously elected president of the Southern California Chapter of the American Institute of Architects at the December meeting. Other officers were elected as follows: Mr. Reginald Johnson, vice-president; Mr. Chas. F. Plummer, secretary; Mr. Alfred W. Rea, treasurer; and Mr. Edwin Bergstrom, director for three years.

The next national convention of the American Institute will be held in Chicago either in May or June. The president and secretary are ex-officio delegates and other delegates elected were: Messrs. Octavius Morgan, D. C. Allison, A. M. Edelman, Myron Hunt, Reginald Johnson, Robert H. Orr, and J. J. Backus. Alternates elected were: Messrs. Harwood Hewitt, F. Pierpont Davis, John P. Krempel, R. Germain Hubby and Henry F. Withey.

The executive committee reported two new members by affiliation, Mr. Chas. H. Cheney, city planning architect, reassigned from the San Francisco Chapter, and Mr. Fitch H. Haskell of Pasadena, reassigned from the New York Chapter. Three new associate members have been elected: Messrs. Walter S. Davis, Edgar W. Maybury and Clyde Page.

Big Fresno Plant

The Sugar Pine Lumber Co., of San Francisco, Mr. Elmer Cox, president, has decided to erect a large plant at Fresno. The citizens of Fresno have subscribed $250,000 to provide a suitable site. The company plans to erect a mill to cost $2,500,000 and to construct a railroad and logging plants and equipment in the mountains to cost an additional $2,500,000.

San Francisco Skyscraper

Mr. John A. Hooper, San Francisco lumber and shipping merchant, has purchased the Parrott property, on the northwest corner of California and Montgomery streets, San Francisco, and announces he will erect a many-storied office building on the site in the near future.

Granted Certificates

The State Board of Architecture has granted certificates to practice architecture to the following: Mr. Roy L. Smith, 804 Higgins building, Los Angeles; Mr. J. W. F. Binderheim, with Mr. John C. Austin, Los Angeles; and Mr. O. Lincoln Rogers, San Diego.

Sacramento Bank Building

The Bank of Italy will erect a monumental bank building, having a 40-foot ceiling and classic front, at Sixth and K streets, Sacramento, from plans by Architects George C. Sellon & Co.

Architects Selected for Los Angeles Libraries

The Los Angeles Public Library trustees advertised for bids for plans for a new library building to be erected under a $2,500,000 bond issue. The board has just awarded the commission to Mr. Bertram G. Goodhue of New York and Mr. Carlton M. Winslow of Los Angeles, who offered to design the structure for 4 per cent of the total cost of the building. This idea of inviting architects to bid on work is not a new one, for the selection of an architect for the Sacramento high school was made in a similar manner, despite considerable opposition by members of the profession.

The library board at Los Angeles, in explaining its course, has issued the following statement:

"At a meeting of the Los Angeles board of library directors by a unanimous vote, Mr. Bertram G. Goodhue of New York City with his associate, Mr. Carleton M. Winslow of Los Angeles, were appointed the architects for the new Central Library building.

"Mr. Goodhue is an architect of national, it might be said of international reputation, as in addition to many notable buildings in different sections of the United States, he has planned several churches in Cuba and is a recognized authority on Mexican architecture, a most interesting and important development of the Spanish style, which is favored by the Library Board for the new building. Mr. Goodhue is known throughout the eastern part of the country for his work in designing the new group of buildings for the United States Military Academy at West Point and for the Graduate School of Princeton University. St. Thomas' Church on Fifth avenue in New York City and the Chapel of the Intercession, also in New York, are other important examples of his skill. These are all in the Gothic style of architecture, but in recent years Mr. Goodhue has become more and more interested in the Spanish style. Buildings that he has planned in this style are chiefly in the southwest and include the San Diego Exposition group, especially the beautiful California building, the buildings for the United States Naval Air Station and for the United States Marine Base at San Diego, those for the California Institute of Technology in Pasadena, and for the entire industrial town of Tyrone, New Mexico, for the Phelps-Dodge Corporation. Mr. Goodhue has a summer residence at Montecito, near Santa Barbara, and has been in the habit of spending his summers in Southern California for some time past.

"Mr. Goodhue is not unfamiliar with the requirements of successful library planning, having designed libraries for several New England cities and has recently secured the contract for the Sterling Memorial Library at Yale University. This record of the important buildings that he has planned would not be complete without mention of the Nebraska State Capitol, the award for which he recently won in competition with several of the best known architects in the United States.

"It is felt by the Library Board that reliance can be placed on him to plan for the city of Los Angeles a most beautiful and successful structure.

"Associated with him will be Mr. Carleton M. Winslow, who has supervised Mr. Goodhue's work in this locality for the last seven or eight years. Mr. Winslow is now engaged independently upon two important contracts: that of the Fullerton High School and the Glendale Congregational church. The two men have worked together successfully on so many important enterprises that their association in the new library project is another guarantee of its being carried through satisfactorily."

At the same meeting of the library board Messrs. Dodd and Richards were appointed architects for the Hollywood branch to be erected on the site of the present library in Hollywood. This firm acted as architects for the new Pacific Mutual and Pacific Finance buildings and many other Los Angeles structures of importance.

Architectural School at Pasadena

Architectural training under the direction and supervision of distinguished practicing architects and teachers amid a general art environment is now available to students with the opening of registrations for classes in the department of architecture in the atelier conducted by Director Lucile Lloyd at the studio rooms of the Stickney Memorial School of Art, Fair Oaks avenue, near Lincoln avenue, Pasadena.

Director Lloyd has been fortunate in obtaining the co-operation of Architects Reginald D. Johnson and Gordon B. Kaufman in establishing the department. Mr. Johnson has provided works from his library and equipment from his drafting rooms and will later assist the school with professional lectures and critical reviews of the work of the students.

Mr. Kaufman will have entire charge of architectural teaching and his assistance will be available to the students every step of the course. Class B students and beginners are now being enrolled. Arrangements have been made whereby the Beaux Arts competition problems will be open to students.

Next Institute Convention

The directors of the American Institute of Architects have accepted the invitation of the Illinois Chapter to hold the next annual convention at Chicago. The time will be in May.

With the Engineers

Reports from the Various Pacific Coast Societies, Personal Mention, Etc.

Why Engineers Fail to Lead in City Planning

MANY engineers have experienced both regret and a touch of shame at the thought that an activity of so essentially an engineering character as city planning should be for the most part in the hands of other professions. The root of this trouble, as well as of its more general underlying cause, is struck in a brief article by Mr. Paul Green, consulting engineer, Chicago, in the December number of "The Professional Engineer," which is reprinted herewith in full:

City planning may be defined as the arrangement of the physical elements of the modern city or town so as to secure the greatest comfort, convenience ,and material and moral welfare for the inhabitants. The problem requires careful consideration of transportation, sanitation, industrial management, public utilities and topography, as well as the related subjects of realty values and public welfare. It is primarily an engineer's work, but it is seldom handled wholly by engineers.

A new profession of "city planners" has arisen of which it is estimated that three-fourths are landscape architects, one-eighth are architects, and the rest engineers. It seems absurd that the ratio is not reversed. There must be a reason.

The engineer who comes in contact with the usual city planner, trained as a landscape architect, is sometimes impressed with the apparent impracticability of the landscape man. It seems to the engineer that the town planner is doing little but draw curved streets on a topographical map. To this town planner the engineer frequently appears to be narrow, bound by tradition, and one who has no idea of the value of the beautiful, while the engineer thinks of the town planner as the visionary idealist, with no conception of the practical.

Now, as is often the case, they both have some foundation for their belief—"There is a grain of truth in every error and error in every truth." An intricate problem is not helped by ignoring the ideal. Real estate men have found that the inclusion of attractive topographical features in development plans has added materially to the value of the lots they have to sell. Engineers have discovered that a city plan which has taken primary account of the topography and natural transportation lines provides a far more economical place in which to install public utilities, such as sewers, water, gas, paving and street railways; there are many less duplications—"dead ends." Moreover, the wise application of the principal of zoning to an existing or proposed city literally saves millions of dollars by insuring stability of values.

All the fundamentals of zoning, transportation, sanitation, and topography are handled in detail by engineers. Only the application of topography and the surface treatment of the site are fundamentals of the landscape architect's profession. It appears to be a case of the tail wagging the dog; and the reason is not hard to find. The landscape architect has emphasized beauty and welfare and studied the problem as a whole. The engineer has been inclined to stick to his utility skeleton, forgetting its dress at times, and forgetting human nature. He has not been a good advertiser.

What must the engineer who aspires to plan cities do to regain the ground he has lost to his less widely-experienced brother? The answer seems easy. He must study the question as a whole. He must not only be able to design the sewers or the pavement or the water supply, but must study the relation of these utilities and the population to the physical plan, and taking into consideration that "clothes oft proclaim the man," use the landscape architect to dress up his scheme. He must study topography not merely as an adjunct to one of these divisions, but to all of them; and not study it last, but among the first. He must look at the problem from the real estate man's viewpoint and from the point of view of public welfare and popular appeal. And to do this, he must study zoning, consult with the landscape architect as to beauty, with the architect as to group buildings, and with the statistician, the railway transportation expert, the street superintendent, the marine shipper, the industrial expert, and the social worker.

With the public utilities—where most of the money is spent—he is already an expert; with the rest, which represent, perhaps, not so much an initial direct money outlay as human qualities, he must become familiar. Until he does, he will be only a worker in the field and not a leader.

The public thinks more of engineers these days. It is because more engineers are breaking away from their narrow professional groove and taking their just place in the larger field. In some small degree they are getting into politics in its best sense. Our technical societies are

considering broad public questions and are publishing their opinions. This is good. When the municipal engineer does this he is on his way toward more effective town planning.

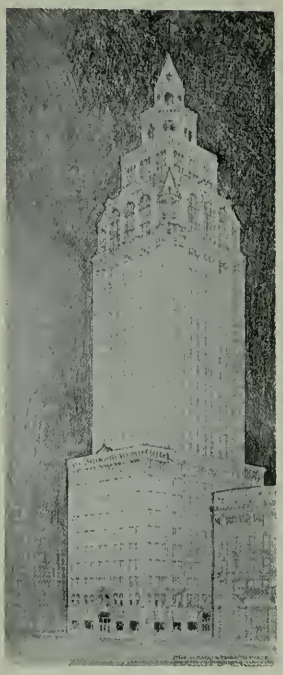
Town planning requires close analysis of present and probable future conditions, and strong, competent direction. Hard business sense must be in evidence or the public will solve its problem without the engineers' guidance. So it is up to engineers to see that the public is impressed with the necessity of technical advice.

During the war, the government organized the United States Housing Corporation to build houses for munition workers. This was necessary to enable the great manufacturing and munition plants to obtain and keep labor. An engineer headed this corporation as its president. At first even he did not apparently sense the value of engineering advice in its fullest sense. But as time went on, the small engineering force became more and more powerful. Many complete cities were planned and some partially executed. Eminent architects, landscape architects, and engineers collaborated in the work, but it was very noticeable that the logic of events pushed the engineers to the front, and before the work was completed the engineering force dominated the situation, not entirely so because of the able personnel of the engineering division, but it was because of the irresistible logic of events.

It may be safely stated that every engineer who came into contact with these architects and landscape architects learned a great deal, broadened his horizon, and was a better man for his experience. But it was also strongly impressed on every one of these engineers that even though the bulk of the work (the houses) is architectural work, yet the problem is an engineering one and should be under the direction of an engineer. How much more is this true in city planning when the plan shows little or nothing of the actual house or other building, but goes into detail as to the streets, the traffic, the transportation, sanitation and public welfare as represented by parks, breathing spaces, and zoning.

Engineers Elect Officers

Mr. W. H. Phelps, assistant engineer of the Pacific Coast division of the Southern Pacific Company, has been elected president of the San Francisco Chapter of the American Association of Engineers. Other officers elected for the 1922 term are: Messrs. George Mattis, ex-officio city engineer and superintendent of streets, Oakland, first vice-president; Donald M. Baker, engineer with the State Division of Water Rights, second vice-president; F. J. Amweg, consulting engineer, treasurer, and Capt. A. J. Capron, retired, construction engineer, secretary.



Engineers Plan Skyscraper

PRELIMINARY sketches have been prepared by Architects J. Martin Haenke and Edward G. Garden (no longer associated) for the proposed Engineering and Industry building to be erected in San Francisco and which will be the permanent home of the following engineering and industrial associations:

San Francisco Electrical Development League.
San Francisco Engineers' Club .
Joint Engineering Council of San Francisco.
San Francisco Section, A. S. M. E.
San Francisco Section, A. I. E. E.
San Francisco Section, A. I. M. E.
San Francisco Section, American Chemical Society.
San Francisco Section, A. M. C. E.
San Francisco Chapter, American Association of Engineers.
California Association of Electrical Contractors and Dealers.
CommonwealthClub .

The building will be from twenty to twenty-five stories and will cost $2,000,000, including the site. A Board of Regents has been appointed to take charge of the enterprise and plans for financing the big project already are well advanced. It is expected that the building will be ready for occupancy during the spring of 1924.

The Contractor

BUILDING CONSTRUCTION, BRIDGES AND ROAD WORK

New Wage Scale of San Francisco Building Crafts

The following shows the new scale of wages for the building industry in San Francisco and the Bay cities, fixed by the wage board of the Industrial Association of San Francisco:

Craft—	Present Wage	New Wage	Helpers
Asbestos workers	$7.85	$7.00	....
Bricklayers	9.25	9.00	....
Bricklayers' hodcarriers	7.40	6.00	....
Cabinet workers—in shop	7.40	7.00	....
Cabinet workers—outside	8.35	8.00	....
Carpenters	8.35	8.00	$6.00
Cement finishers	8.35	8.00	....
Electrical workers	9.25	8.00	6.00
Elect. fixture hangers	7.40	7.00	....
Electrical hoistmen	8.35	6.00	....
Elevator constructors	7.85	8.00	6.00
Engineers—stationary	7.40	7.00	....
Engineers—traveling crane	8.35	7.50	....
Engineers—on derricks	8.35	8.00	....
Glass workers	7.85	7.50	....
Housemovers	8.35	8.00	....
Housesmiths—			
Architectural iron	7.40	7.00	....
Reinforced concrete	7.85	7.00	6.00
Iron workers—Bridge and structural	9.25	9.00	....
Labor—Common (six day week)	6.00	4.50	....
Laborers—Skilled	6.00	5.00	....
Lathers	9.25	8.00	....
Marble setters	7.40	8.00	5.50
Marble cutters and copers	6.95	7.00	....
Marble bed rubbers	6.50	6.50	....
Marble polishers and finishers	6.00	6.00	....
Millmen—			
Planing mill dept	7.40	7.00	....
Sash and door	6.50	6.00	....
Millwrights	8.35	8.00	....
Modelmakers	9.25	9.00	....
Model casters	8.35	7.50	....
Mosaic and terrazo workers	7.85	7.50	5.60
Painters	8.35	8.00	6.00
Painters—			
Varnishers and polishers (shop)	6.95	7.00	....
Varnishers and polishers (outside)	8.35	8.00	....
Plasterers	10.20	10.00	....
Plasterers' hodcarriers	8.35	7.00	....
Plumbers	9.25	9.00	6.00
Roofers, composition	8.35	7.50	....
Sheet metal workers	9.25	8.50	6.00
Sprinkler fitters	9.25	7.20	....
Steamfitters	9.25	9.00	6.00
Stair builders	8.35	8.00	....
Stone cutters, soft	8.35	8.00	....
Stone cutters, granite	9.00	8.00	....
Stone setters, soft	9.00	8.50	....
Stone setters, granite	10.00	8.50	....
Stone carvers	9.00	8.00	....
Stone derrickmen	8.35	8.00	....
Tile setters	8.35	8.00	5.50

Concrete Institute Convention

The American Concrete Institute will hold its annual convention at Cleveland, Ohio, February 13-16. The program, as outlined by the board of direction, after considering the committee reports which are expected to be ready for discussion, will be spread over nine convention sessions—two sessions a day for three days and three sessions on a fourth day. These will be divided as follows: two sessions for contractor problems—the practical problems on the job; two sessions for concrete products manufacturers; one session on roads; one session on houses; one session on research; two sessions on engineering design and inspection.

This Machine Tunnels and Builds Walls

An automatic tunnel-digging machine, the invention of a Philadelphian, is creating considerable interest.

The machine digs a tunnel, removes the earth and places a concrete wall around the excavation almost simultaneously, leaving a finished tunnel, or conduit.

The new machine now is being used to construct an underground conduit at Fifth and Grange streets. Its inventor is Milton Roy Sheen, who worked on the design for five and a half years. He also designed the concrete blocks with which the machine lines the tunnel it digs. The only supplementary work required to start the machine is an excavation sufficiently large to accommodate it.

Aside from greatly expediting and simplifying the work of tunnel and conduit construction, the new machine is said to operate without making it necessary to block or interfere with traffic as is ordinarily the case.

On the present operation, which is proceeding successfully, the machine was run steadily for a stretch of four hours, in which time it constructed eighteen feet of conduit fifty-two inches in diameter. The best run for one hour was five feet eight inches of finished conduit. Mr. Sheen says his machine can be used in the construction of sewer mains, water mains, conduits and tunnels for any purpose up to twelve feet in diameter.

What is considered to be one of the machine's greatest advantages is that it can operate in residential sections without the residents being made aware of it.—Herald-Examiner.

1921 Construction

THERE was a decided increase in the construction of dwelling houses in this country during the first ten months of 1921, according to information obtained by the Civic Development Department of the Chamber of Commerce of the United States.

Construction figures furnished by forty-four important cities, show that during the period from January to October of the past year about $603,000,000 went into new construction, while during all 1920 the total in the same cities was only $8,000,000 more. During the shorter period last year 57.9 per cent. of the total was for dwelling houses as against only 36.1 per cent. in 1920.

Figures from some of the reporting cities are not brought up to date as it is not universal practice to make monthly reports, and the indications are that the dwelling percentage will be larger when all figures are in, according to the National Chamber's report.

The estimated cost of all construction reported in the forty-four cities for ten months of 1921 exceeds $722,000,000, of which $349,000,000 is residential and $254,000,000 non-residential. Alterations, repairs and special construction cost $119,000,000. Not only would these totals be increased if all reports were up-to-date, according to the National Chamber, but as costs have been reduced, each dollar last year represented an increased volume of construction.

The total estimated cost reported by the same cities for the entire year of 1920 was 798,000,000.

The forty-four cities included in the report, according to the Bulletin of the Associated General Contractors, are:

Birmingham,
Los Angeles,
Oakland,
San Francisco,
Denver,
Hartford,
New Haven,
Waterbury,
Wilmington,
Washington, D. C.
Atlanta,
Kansas City, Kans.
Louisville,
Baltimore,
Boston,
Fall River,
Lynn,
New Bedford,
Somerville,
Springfield, Mass.
Detroit,
Grand Rapids,
Minneapolis,
Kansas City, Mo.
St. Louis,
Camden, N. J.
Jersey City,
New York City,
Manhattan,
Brooklyn,
Rochester,
Syracuse,
Akron,
Columbus, O.
Toledo,
Oklahoma City,
Portland, Ore.
Philadelphia,
Nashville, Tenn.
Dallas,
Houston,
Richmond,
Seattle,
Spokane,
Tacoma,
Milwaukee.

Quantity Surveying

The Architect and Engineer has received a copy of a circular letter being sent to the architects and engineers generally, by Mr. Arthur Priddle, authority on quantity survey, with offices in the Builders' Exchange building, San Francisco. The letter is as follows:

With the discussion regarding Quantity Surveying now going on in view, and especially the article in the December issue of The Architect and Engineer on the subject, I propose a trial of the plan, and hereby offer you a complete bill of materials for bidding on the general construction, or any branch of a medium size job, so that you can hand a copy to the contractors with plans and specifications.

With the plans and specifications and other data you furnish me, please state how many copies of the list you require for use—there need be no limit.

I suggest that you insert in your general specifications, under the heading "Quantity Survey," the following: "The contractor bidding on the work herein described will add to his estimate a (minimum) cash sum, amounting to one-quarter of one per cent (¼x1%) of the total amount of bid, including the aggregate of all alternates, for Quantity Surveying, which amount is to be paid over at the direction of the architect if and when the work is awarded to him. This provision applies and the cash amount is to be paid, as directed, regardless of any change or modification made prior to the award of the work to him."

If this is done the contractor bidding will not be put to any expense for the survey and he will be on an equal quantity basis with other bidders—he can easily check up the work in a short time and you will get all the bids you waut with less expense for prints than is usual. He will also have correct data for figuring the alternates, the place where he usually is weak.

For the protection of the Quantity Survey—the contractor taking out the plans and specifications will be required to place a bid and there would seem to be no excuse for his failing to do so and I think it should be impressed upon the contractor that the Quantity Survey is confidential and not to be communicated to anyone—you can see that manipulating the information could work an injustice on the Quantity Surveyor and cheat him out of his legitimate fees. The contractor cannot object as in this manner the owner pays the cost, which is right.

I will confer with you and satisfy you that the survey is complete and as desired before it is issued. Sincerely yours,

ARTHUR PRIDDLE.

American Society Civil Engineers

Following are the officers elected by Los Angeles Section, American Society of Civil Engineers, for 1922:

President, Mr. Ralph J. Reed, chief engineer of construction of Union Oil Company; first vice-president, Mr. F. D. Howell, transportation engineer; second vice-president, Mr. W. H. Code, consulting engineer; treasurer, Mr. E. R. Bowen, consulting engineer; secretary, Mr. F. G. Dessery, consulting engineer; directors, Messrs. R. J. Reed, F. D. Howell, W. H. Code, E. R. Bowen, F. G. Dessery, W. K. Barnard, consulting engineer, and H. W. Dennis, chief engineer of construction of Southern California Edison Company.

WAREHOUSE FOR ALMOND GROWERS' ASSOCIATION, OAKDALE
(Sawyer System Pre-cast Unit Concrete Construction)

The Ideal Cement Block is Here

NO progressive architect, engineer, contractor or builder can in these days ignore the claims of concrete as a factor of supreme importance to be reckoned with in the general field of construction. Portland cement has long since passed the stage where it was regarded as more or less experimental and suitable only for underground and underwater work. It has entered aggressively the field of general construction, and in spite of the fact that not all its structural applications and systems have yet been standardized, nor all of its problems solved, it has without question "made good" wherever used with proper skill and supervision.

Its possibilities have been demonstrated for bridges, tunnels, pile work, warehouses, office buildings, theatres, residences, and, in fact, every kind of building construction. When concrete first commenced to be popular various manufacturers undertook to produce a cement block machine that would turn out hollow cement blocks for commercial and domestic buildings. The blocks were crude, heavy and insightly. Absence of beams and studs made the cement block wall unsafe and frequent failures caused contractors to discourage the use of hollow blocks, while architects refused to consider them at all on account of their ugliness.

But times have changed, and today it is possible not only to build of concrete blocks with every assurance of safety, but the owner can depend upon having an attractive building when the structure is finished.

A plant has been erected at Modesto for Mr. O. A. Bosley for the manufacture of the so-called Sawyer system pre-cast unit concrete blocks and, although in operation less than two years, the industry has developed to such a point that steps are about to be taken to enlarge the plant and, with abundant financial backing, additional plants will probably be established at convenient points throughout the state. Buildings have been erected according to the Sawyer system in Oakland, Los Angeles, Visalia, Modesto and other cities, some of the satisfied owners being the California Co-operative Canning Association, various Oakland garage dealers, Mr. H. L. Reichsrath of San Leandro and others. An ordinance is now being drafted for the city of San Francisco which will place the Sawyer system within the limits of Class C construction, and the system may also be used for curtain walls in both ClassA and Class B construction.

An ordinance was passed in the city of Oakland August 19, 1920, fully covering this construction.

Mr. O. A. Bosley, the manufacturer and builder of these blocks in California, describes the system as follows:

"This system is the invention of Mr. F. McMurray Sawyer, an architect of Los Angeles, California. The two-piece self-locking sectional wall is practically monolithic in construction, with none of the disadvantages of a solid concrete

ASCHER'S
ROOSEVELT
THEATRE
CHICAGO, ILLINOIS

C. HOWARD CRANE
Architect

Black spotted cream glazed Terra Cotta with polychrome ornament.

Drawing by Hugh Ferriss

Vanished Limitations of DRAMA *and* ARCHITECTURE

FROM its early beginning in Ancient Greece, the drama has had a steady development through the ages. Advance has been apparent with each succeeding century. One by one the early hindrances to realistic portrayal have disappeared But not until the development of the motion picture have the limitations of time, place and motion been entirely swept away.

Architecture, too, has developed,—from slow and costly construction with hand-carved stone, to the point where even the most beautiful designs of the ancients can be reproduced quickly and economically.

As the presentation of a great dramatic story is made possible by the versatility and range of the screen, by the plasticity of the motion picture to the vision of the director, so the most ambitious architectural project is made possible by the versatility and range of Terra Cotta, by its plasticity to the vision of the architect.

Architects design in Terra Cotta because of its expressiveness, its permanence and its economy in the realization of ambitious designs.

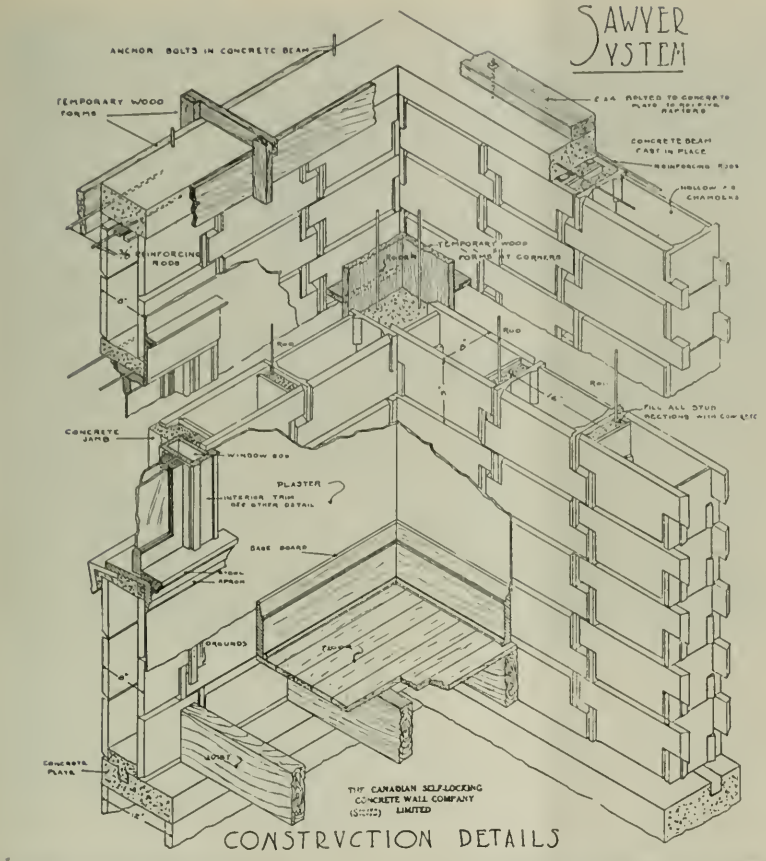
NATIONAL TERRA COTTA SOCIETY is a bureau of service and information. Its publications cover not only the technical and structural use of the material, but show, as well, examples of its application to buildings of various types. Information to meet any specific need will gladly be sent on request. Address National Terra Cotta Society, 1 Madison Avenue, New York, N. Y.

TERRA COTTA

Permanent *Beautiful* *Profitable*

BUNGALOW BUILT IN SOUTHERN CALIFORNIA ACCORDING TO THE SAWYER SYSTEM

THE SAME BUNGALOW AFTER APPLICATION OF EXTERIOR CEMENT FINISH



STORE AND APARTMENT BUILDING, SAN ANSELMO, CAL.
(Sawyer System Pre-cast Unit Concrete Construction)

WALLS OF WINTER GARDEN, MODESTO, SHOWING METHOD OF CONSTRUCTION, SAWYER SYSTEM

wall, and is built without the use of wooden forms. The wall consists of two units, namely, the main slab and locking (or key) slab, which are both shaped so that each dovetails into the other, in such a manner, when placed in the wall, that the interlocking part of the slabs form a space which is poured with grout (concrete) and locks the wall together, forming concrete self-aligning studs or columns, every 16 inches for the full height of the wall. These columns can be reinforced if necessary to carry extra heavy loads. The cement slabs form two parallel curtain walls, serving to perfect the construction by forming a hollow wall which is absolutely moisture proof.

"To finish the exterior, a coat of stucco (cement plaster) is applied uniformly on the surface. This is a very satisfactory finish, for the slabs present such uniform surface that the average thickness required is not more than three-sixteenths to one-fourth of an inch. This thin coating, knitting, as it sets, to the concrete slabs, forms a coating which will not crack or check. The coat of stucco, working into the V-shaped grooves produced by the bevel of the slabs, and into the vertical grooves of the stud section, knits the wall together into a solid monolithic mass. The plaster on the interior acts in the same way and requires no furrows or laths.

"Molds as used in this system are made of light wood, with strips and pieces of wood nailed to them so as to form whatever desired shape-unit is wanted. These molds are then stacked or placed together to form a series of multiple cells, each one of which is the mold for a concrete unit. A level floor is used as a pouring place, the molds are stacked vertically, and in accurate alignment and clamped tightly by screw-jack or clamp arrangement. It is common practice to pour the mixture into more than one row of cells at a time, as rows of molds can be stacked alongside of one another without interference.

"Pouring is done with a wet or slush mixture, and the equipment can be adapted to meet the condition and size of the structure that is to be built. After the molds are filled, they are cured for twelve hours by wet steam. The clamps are then loosened, the segments or concrete units being lifted out and stacked to further cure for three weeks in water, and the molds restacked and poured again. The mixture is of such richness and consistency that the product can, within a very short time, be handled with little or no danger of any breakage occurring.

"The cost of constructing buildings by this system is 20 per cent less than ordinary concrete and brick construction."

Lead Too Pure for Cathedral Roofing

(Concluded from page 107)

they found that the grade of commercial lead used was 99.9 per cent pure, far too pure for satisfactory roofing. They recommended the use of what is technically called "hard lead," which contains approximately six per cent. antimony.

Lead roofs on European cathedrals have lasted for 300 to 500 years, and the metallurgists are of the opinion that lead as manufactured in those days had impurities sufficient to harden it for roofing use.

Sash Chain Company Establishes Coast Agency

Announcement is made by the Smith & Egge Manufacturing Company, originators of metal and steel sash chain, that they have appointed Messrs. Rawlins and Smith their Pacific Coast representatives, with offices at 507 Mission street, San Francisco, and 515 I. W. Hellman building, Los Angeles. Stock will be kept on hand for immediate delivery and orders sent to them will receive prompt attention. Lowest price quotations may be obtained from Messrs. Rawlins & Smith.

Two Quality Types of Steel Sash

The Lupton Steel Sash Company is credited with being the first concern to manufacture two types of sash from solid rolled steel sections. Lupton counterbalanced sash was first used in 1911 and Lupton counterweighted sash in 1912. Recently both types have been improved in detail and modified to facilitate their manufacture in quantity. Both are intended for buildings above the ordinary in quality of construction and in ventilating requirements.

On account of their similarity in construction and general appearance, both types of sash can readily be used in the same building, Lupton counterbalanced sash in the factory portion and Lupton counterweighted sash in the office portion. This is a feature of great value for industrial buildings.

These sash are made with the top and bottom sash of each pair hung over one set of pulleys, so that they open or close simultaneously.

For industrial buildings requiring individually operated windows, Lupton counterbalanced sash is the highest grade and most durable window made.

A revised catalogue on these types of sash is in preparation. Send your request now for a copy to be sent as soon as published.

S. F. Bowser and Richardson-Phenix Companies Consolidate

The Richardson-Phenix Company and S. F. Bowser & Company, Incorporated, announce their consolidation.

The purpose is to improve the service to those who use equipment for the efficient and economical lubrication of all classes of machinery; to combine and apply as a unit the resources for research of both these leading companies; to even more completely embody in the design and manufacture of lubricating apparatus those sound engineering principles that are paramount in an art that must keep abreast of all engineering progress; to cooperate with the builders of machinery and the lubrication engineering world in the solution of the problems met in scien-

tific lubrication and the conservation and reclamation of lubricating oils.

The filtration and lubrication appliance business of both companies will be conducted by the Richardson-Phenix Division, S. F. Bowser & Company, Inc., with main offices at Fort Wayne, Indiana, to which, beginning immediately, all correspondence should be addressed.

Mr. J. Wm. Peterson, president of the Richardson-Phenix Company, will assume the office of vice-president of S. F. Bowser & Company, Incorporated, and will be in charge of the Richardson-Phenix Division. The highly specialized personnel and factories of the Richardson-Phenix Company are retained. The assets of the consolidation are valued at $10,000,000.

Consolidation

Lakewood Engineering Co., of Cleveland, Ohio, have consolidated their Pacific Coast office with those of Smith Booth Usher Company, located at 50-60 Fremont street, San Francisco, and 228-238 Central avenue, Los Angeles.

This is really a natural consolidation, as Smith Booth Usher Company have heretofore been exclusive representatives of the Lakewood Engineering Company both in San Francisco and Los Angeles, while Mr. M. B. Rider, manager of the Pacific Coast states for the Lakewood organization, has also maintained an office in San Francisco.

In making this consolidation, Smith Booth Usher Company have acquired Mr. Rider, who has been with the Lakewood organization for a number of years. He will, therefore, be available to answer all calls made on him by contractor friends and acquaintances.

Lakewood equipment is well known in this territory, it having been used on many of our largest construction projects.

The Maricopa County, Arizona, contract for the building of approximately 283 miles of concrete roads, is being built with Lakewood equipment exclusively, and Twohy Bros., contractors, are making a record performance in this work.

Lakewood concrete equipment has been used in the construction of such buildings as the Pacific Mutual and the Pacific Finance buildings in Los Angeles. Also it has been used in the construction of such work as the Sweetwater dam, Barrett dam, Elephant dam, Devils Gate dam, and the San Dimas dam.

New Tile Products—Cold Process

Of interest to every builder and contractor in California and the Northwest is the new patented process for making decorative tile products, now being presented by the Alpha Tile Co., with offices at 170A Golden Gate avenue, San Fran-

cisco, and production plant at 6704 Santa Monica boulevard, Los Angeles. New business conditions now existing have forced every builder to face the problem of reducing expenses. The public demands lower prices and expects more for its money. Tile is now the popular material for mantles, fireplaces, vestibules, store fronts, counters, etc. This cold process enables any contractor to make his own tile without any burning or baking.

The products have been thoroughly tried out and some remarkable tests and recommendations are shown and the tiles are giving the best of satisfaction in homes where they have been installed. The heavy glazed facing is put upon a water-proofed cement base and has many advantages and merits.

There are no restrictions as to color, size or shape and no limit to the beautiful color combinations that can be worked out by the process. They are made to a scale—no checking or warping. They resist stain, and an occasional cleaning with a damp cloth keeps them in their original state. There is an unlimited field for a good product of this kind and its development and use will be watched with interest by builders.

Exclusive manufacturing and sales rights on this process are now being sold responsible contractors.

Seeing the Italian Villas

A pamphlet, "Seeing the Italian Villas," a reprint of an article appearing in Landscape Architecture for October, 1921, is of more than passing interest to any one anticipating a trip to Italy.

The writer, Leon Henry Zach, has given detailed information as to the location and means of getting into the best examples of villas in or near Rome, Frascati, Tivoli, Florence, Lake Como villas, and many others. To those who have spent much time and often much money in trying in vain to get into Italian villas the notes will be appreciated as an invaluable guide as to the best method of procedure.

No one can really see or feel the spirit of Italy without visiting its great variety of villas, combining the skill of the landscape architect, the architect, the sculptor and often the painter.

A limited number of the pamphlets are available at a charge of fifty cents per copy, by addressing Mr. C. R. Parker, business manager landscape architecture, Brookline 46, Massachusetts. — WILBUR DAVID COOK.

County Hospital Group

Plans are being completed and bids will be called for about March 1st for a group of county hospital buildings at Yreka, Siskiyou county, for which there is available $240,000. The architects are George C. Sellon & Co. of Sacramento. The main building will be of reinforced concrete with terra cotta tile roof.

Factory and Warehouse

Fuller & Goepp, San Francisco wholesale glass dealers, have awarded a contract to MacDonald & Kahn for approximately $40,000 to build a two-story and mezzanine reinforced concrete factory and warehouse at Eleventh and Jackson streets, Oakland.

A·F·B·A
USE FACE BRICK
—it Pays

Entrance, Industrial School of Arts, Trenton, N.J. Cass Gilbert, Architect

A very effective employment of simple soldier and rowlock courses for the embellishment of the wall surface. Note especially the treatment of the broad belt course at the second story.

A Portfolio of Architectural Details in Brickwork

AS the architect is desirous of having conveniently at hand illustrations of beautiful brickwork, the American Face Brick Association has prepared an enclosed folder, file size with printed tab, which at present contains thirty-two de luxe half-tone plates of the finest types of brickwork.

These examples cover a wide range of interior and exterior subjects, and will be useful in the drafting room for suggesting many interesting methods of treating the wall surface. This portfolio will be added to from time to time with further examples, with data on brick, and its uses, and with monographs on the treatment of the mortar joint in connection with the blending of the brick color tones.

A set of these plates in the folder will be sent to any architect requesting them on his office stationery, and his name will be placed on the list for future mailings.

AMERICAN FACE BRICK ASSOCIATION

1159 WESTMINSTER BUILDING · CHICAGO, ILLINOIS

ARMCO INGOT IRON

TRADE MARK
FOR ENAMELED PRODUCTS

The Beauty
of Fine Porcelain with the Strength of Iron

Look for this Blue and Gold Armco Label on Washing Machines, Stoves, Ranges, Refrigerators, Enamel Table Tops and other household & commercial utilities. It carries with it the assurance of the quality and solid worth of the sheet metal parts of articles that bear it.

MADE FROM ARMCO RESISTS RUST INGOT IRON

A refrigerator of enameled "Armco" Ingot Iron has the sheer, beautiful gloss of fine porcelain. The surface is smooth and unbroken by "pin-holes," bubbles, or lumps.

This is due to the purity of the iron base. By special processes of manufacture, "Armco" Ingot Iron sheets are purified of foreign matter that is found in all iron ore and in the other metals used. Thus the tiny atoms of iron are closer together, the texture is uniform, and the enameling grips with the maximum adherence. There is no tendency of the enamel to split, crack, or flake.

When buying a refrigerator, a stove, a washing machine, or an enameled table top, ask the salesman if it is made from "Armco" Ingot Iron. Look for the blue and gold Armco triangle, which manufacturers are glad to place upon such products.

THE AMERICAN ROLLING MILL CO.
MIDDLETOWN, OHIO

An ample supply of ARMCO stock is carried in the San Francisco warehouse, Tenth and Bryant streets. Other branch offices in New York, Pittsburg, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, Washington and Buffalo.

The ARCHITECT & ENGINEER

FEBRUARY 1922

Published in San Francisco
50 cents a copy - $2.50 a year

WILL H. TOEPKE
Architect

WILL H. TOEPKE

Residence
San Mateo, California
covered with a

PABCO 10-Year Roof

WHEN a prominent San Francisco architect—Will H. Toepke—specifies a roof of this type for his own handsome residence (shown above) it is plain to see why PABCO Roofs appeal so strongly to Architects, Engineers and Owners.

PABCO 10- and 20-Year ROOFS

are rapidly displacing the old style felt and gravel roofs. The proved superiority of PABCO Roofs is due largely to the following outstanding advantages:

1. *A complete and definite specification*
2. *Superior wearing qualities*
3. *Greater tensile strength*
4. *Highest grade materials*
5. *A proved method of construction*
6. *Low maintenance cost.*

Write for Specifications, samples and complete details

THE PARAFFINE COMPANIES, INC.
San Francisco, California

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Roofings—Felts
Roof Coatings
Building Papers
Floor Covering
Wall-Boards
Waterproofing Materials
Paints
Box-Board
Paper Boxes
Fibre Containers

"Each the Standard of Its Kind"

The Architect and Engineer—FEBRUARY, 1922—Vol. LXVIII, No. 2. Published monthly—$2.50 a year. 627 Foxcroft Building, San Francisco, California. Entered as second-class matter, November 2, 1905, at the Post Office at San Francisco, California, under the act of March 3, 1879.

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ART METAL
Federal Ornamental Iron and Bronze Co., 16th St. and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Tropico Potteries, Inc., Glendale, Cal.

AUTOMATIC SPRINKLERS
Grinnell Co. of the Pacific, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Company, 72 Natoma street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

AUTOMOBILES
W. L. Hughson Co., Geary St., at Van Ness Ave., San Francisco.

BANKS
First National Bank, Post and Montgomery streets, San Francisco.

BANK FIXTURES AND INTERIORS
Fink & Schindler, 218 13th St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.

BELTING AND PACKING
New York Belting and Packing Company, 519 Mission St., San Francisco.
H. N. Cook Belting Co., 401 Howard St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

BLACKBOARDS
C. F. Weber & Co., 985 Market St., San Francisco, Los Angeles and Reno, Nevada.
Beaver Blackboards and Greenboards, Rucker-Fuller Desk Company, Coast agents, 677 Mission St., San Francisco; also Oakland and Los Angeles.
Steuart Sales Co., 247 Rialto Building, San Francisco.

BLINDS—VENETIAN AND DIFFUSELITE
J. G. Wilson Corporation, Metropolitan Bldg., Los Angeles; Waterhouse-Wilcox, Underwood Bldg., San Francisco.
Western Blind & Screen Co., Long Beach Ave., Los Angeles; C. F. Weber & Co., San Francisco, Los Angeles, and Phoenix, Ariz.

BOILERS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
Kewanee Water Supply System, Simonds Machinery Co., 117 New Montgomery St., San Francisco.

BOOK BINDERS
Abbott-Brady Printing Corp'n, 460 Fourth St., San Francisco.

BONDS FOR CONTRACTORS
American Mutual Liability Insurance Co., Balboa Bldg., San Francisco.
Bonding Company of America, Kohl Bldg., San Francisco.
Bankers & Shippers Insurance Co. of New York, Insurance Exchange Bldg., San Francisco.
Globe Indemnity Co., 444 California St., San Francisco.
Fidelity & Casualty Co. of New York, Balfour Bldg., San Francisco.
National Surety Co. of New York, 105 Montgomery St., San Francisco.
William Healey & Son, 208 Crocker Building, San Francisco.

BRASS GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 635 Mission St., San Francisco.

BRICK, PRESSED, PAVING, ETC.
Richmond Pressed Brick Co., Sharon building, San Francisco. Plant at Richmond, Cal.
United Materials Co., Sharon Bldg., San Francisco.
Cannon & Co., Sacramento; and 77 O'Farrell street, San Francisco.

BRICK & CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
The Paraffine Companies, Inc., 34 First St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.
Wadsworth, Howland & Co., Inc., Boston, Mass., manufacturers of Bay State Brick & Cement Coating. Jas. Hambly & Son, agents, San Francisco and Los Angeles.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn., coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Palace Hardware Company, Agents Corbin goods, 581 Market St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora; Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.

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BUILDING MATERIALS, SUPPLIES, ETC.
Abeel-Jensen Co., Call Bldg., San Francisco.
Pacific Materials Co., Underwood Bldg., San Francisco.
Waterhouse-Wilcox Co., 523 Market St., San Francisco.

BUILDING PAPER
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

CABINET MAKERS
Home Manufacturing Company, 543 Brannan St., San Francisco.
Fink & Schindler Co., 218 13th St., San Francisco.
Mullen Manufacturing Company, 64 Rausch St., San Francisco.
Lannom Bros. Mfg. Co., 5th and Magnolia sts., Oakland.
Pacific Mfg. Co., San Francisco, Los Angeles and Oakland.

CARPETS
John Breuner Co., 281 Geary St., San Francisco.
D. N. & E. Walter, Mission near Second street, San Francisco.
W. & J. Sloane, 216-228 Sutter street, San Francisco.

CASEMENT WINDOW HARDWARE
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

CASTINGS
Victory Manufacturing Co., Monadnock building, San Francisco.

CEMENT
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.
Medusa White Portland Cement, manufactured by Sandusky Cement Co., represented in San Francisco by Pacific Building Materials Co., Underwood Bldg., San Francisco.
Old Mission Portland Cement Co., Mills Building, San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Armorite, sold by W. P. Fuller & Co., all principal Coast cities.
Bay State Brick and Cement Coating, manufactured by Wadsworth, Howland Co., Boston, Mass. James Hambly & Son, Distributors, San Francisco and Los Angeles.
Medusa White Portland Cement, manufactured by Sandusky Cement Co., represented in San Francisco by Pacific Materials Co., 525 Market St., San Francisco.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CLAY PRODUCTS
Cannon & Co., Sacramento, Cal.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Tropico Potteries, Inc., Glendale, Cal.
United Materials Co., Sharon Bldg., San Francisco.

CLOCKS—ELECTRIC TIME
Pacific Electric Clock Co., 516 Wells-Fargo Bldg., San Francisco.
Standard Electric Time Co., 461 Market St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORS
"Linotol" plastic flooring, Hill, Hubbell & Co., 115 Davis street, San Francisco; 410 San Fernando Bldg., Los Angeles.

CONCRETE CONSTRUCTION
Barrett & Hilp, 918 Harrison St., San Francisco.
Clinton Construction Co., 140 Townsend street, San Francisco.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
P. A. Palmer, Monadnock Bldg., San Francisco.
I. M. Sommer, 401 Balboa Bldg., San Francisco.
Steelform Contracting Company, 681 Market St., San Francisco.

CONCRETE OR CEMENT HARDENER
Gunn, Carle & Co., Inc., 444 Market street, San Francisco.

CONCRETE MIXERS
Foote and Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

CONCRETE REINFORCEMENT
Edw. L. Soule Co., Rialto bldg., San Francisco.
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Triangle Mesh Fabric. Sales agents, Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., 527 Tenth St., San Francisco.
Badt-Falk Co., Call-Post Bldg., San Francisco.

CONDUITS
Garnett Young & Co., 612 Howard St., San Francisco.

CONTRACTORS, GENERAL
Barrett & Hilp, 918 Harrison St., San Francisco.
Larsen-Siegrist Co., Inc., 807 Claus Spreckels Bldg., San Francisco.
R. W. Littlefield, 357 12th St., Oakland.
Lawton & Vezey, Call building, San Francisco; Plaza building, Oakland.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
Unit Construction Co., Phelan Bldg., San Francisco.
J. D. Hannah, 142 Sansome St., San Francisco.
John M. Bartlett, 357 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL—Continued
Herbert Beckwith, 323 Newton Ave., Oakland.
Collman & Speidel, 546 Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Monson Bros., 251 Kearny street, San Francisco.
Fontanella & Teza, 1682 Eddy Street, San Francisco.
Geo. Wagner, 251 Kearny street, San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.
McLeran & Co., R., Hearst Bldg., San Francisco.
Robert Trost, 26th and Howard Sts., San Francisco.
I. M. Sommer, 401 Balboa Bldg., San Francisco.
S. G. Jackson, 351 12th St., Oakland.
Jas. L. McLaughlin, 251 Kearny street, San Francisco.
Alfred H. Vogt, 185 Stevenson street, San Francisco.

CONTRACTORS' EQUIPMENT
Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Hearst Bldg., San Francisco.
Smith, Booth-Usher Co., 60 Fremont St., San Francisco; 228 Central Ave., Los Angeles.

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CONVENIENCE OUTLETS
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.

CRUSHED ROCK
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

DAMP-PROOFING AND WATERPROOFING
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Bay State Brick & Cement Coating, mfrd. by Wadsworth, Howland Co., Boston. James Hambly & Son, distributors for Northern and Southern California; depots in San Francisco and Los Angeles.
Samuel Cabot Co., Boston; represented in San Francisco by Pacific Materials Co., Underwood Bldg.
Gunn, Carle & Co., Inc., 444 First street, San Francisco.
Hill, Hubbell & Company, 115 Davis St., San Francisco.
"Pabco" Damp-Proofing Compound, sold by the Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Waterhouse-Wilcox Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Oregon.
Stanley Works, New Britain, Conn. Monadnock Bldg., San Francisco.
Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Drinking Faucet Co., 1808 Harmon St. Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 166 7th St., San Francisco.
San Francisco Elevator Company, Inc., 860 Folsom street, San Francisco.

ELECTRICAL CONTRACTORS
Butte Electrical Equipment Company, 530 Folsom St., San Francisco.
Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.
Brown-Langlais Electrical Construction Co., 313 5th street, San Francisco.
Central Electric Company, 185 Stevenson street, San Francisco.
NePage, McKenny Co., 589 Howard St., San Francisco.
Newbery Electrical Co., 359 Sutter street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Globe Electric Works, 1959 Mission St., San Francisco.
M. E. Ryan, Redwood City, and 520 Clunie building, San Francisco.
H. S. Tittle, 766 Folsom St., San Francisco.
Spencer Electric Co., 355 12th street, Oakland.
Spott Electrical Co., Sixteenth and Clay Sts., Oakland.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.

ELECTRICAL SUPPLIES AND EQUIPMENT
Garnett Young & Co., 612 Howard St., San Francisco.
Butte Electrical Equipment Co., 530 Folsom St., San Francisco.
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.
Safety Electric Company, 56-65 Columbia Square, San Francisco.
Drendell Electrical & Mfg. Co., 1345 Howard St., San Francisco.
Western Electric Safety Mfg. Co., Inc., 247 Minna street, San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 166 7th St., San Francisco.
San Francisco Elevator Co., 860 Folsom street, San Francisco.

ENGINEERS—CONSULTING, ELECTRICAL, MECHANICAL
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

ELEVATOR DOOR HARDWARE
Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

ESTIMATOR—BUILDINGS AND ENGINEERING WORKS
Arthur Priddle, 185 Stevenson street, San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FAIENCE TILE
Tropico Potteries, Inc., Glendale, Cal.

FELT—ASPHALT, DEADNING
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FENCES—WIRE
Standard Fence Construction Co., 245 Market St., San Francisco, and 310 12th St., Oakland.

FILLING STATION EQUIPMENT
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco, 830 S. Los Angeles St., Los Angeles.

FIRE ESCAPES
Michel & Pfeiffer Iron Works, 1415 Harrison street, San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE-PROOF DOORS
Forderer Cornice Works, 269 Potrero avenue, San Francisco.
U. S. Metal Products Co., 330 10th street, San Francisco.
Fire Protection Products Co., 3117 20th street, San Francisco.

FIRE SPRINKLERS—AUTOMATIC
Grinnell Company, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Co., 72 Natoma street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

FIRE RETARDING PAINT
The Paraffine Companies, Inc., 34 First St., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
The Fink & Schindler Co., 218 13th St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

FLOOR TILE
Mangrum & Otter, 827 Mission St., San Francisco.
S. & S. Tile Company, San Jose.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLOORS—HARDWOOD
Oak Flooring Manufacturers' Association of the United States, Ashland Block, Chicago, Ill.
Parrott & Co., 320 California St., San Francisco.
Strable Hardwood Company, 511 First street, Oakland.

FLOORS—MASTIC—FLOOR COVERING
Hill, Hubbell & Company, 115 Davis St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.
Jas. A. Nelson, 517 Sixth St., San Francisco.

FUEL OIL SYSTEMS
S. T. Johnson Co., 1337 Mission St., San Francisco.
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco.

FURNACES—WARM AIR
Mangrum & Otter, 827 Mission St., San Francisco.
Montague Range and Furnace Co., 826 Mission St., San Francisco.
Pacific Heating Company, Second and Grove streets, Oakland.

FURNITURE—BUILT-IN
Hoosier Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—SCHOOL, CHURCH, OFFICE, HOUSE, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
W. & J. Sloane, 216 Sutter street, San Francisco.

GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast Sale offices, San Francisco, Los Angeles and Seattle, Wash
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

GAS STEAM RADIATORS—FUMELESS, ETC.
Ra-Do Fumeless Gas Radiators, manufactured and sold by Baird-Bailhache Co., 478 Sutter St., San Francisco.

GLASS
American Window Glass Co., represented by L. H. Butcher Co., 862 Mission st., San Francisco.
Cobbledick-Kibbe Glass Co., 175 Jessie St., San Francisco.
Fuller & Goepp, 32 Page St., San Francisco, and Syndicate building, Oakland.
W. P. Fuller & Company, all principal Coast cities.

GRADING, WRECKING, ETC.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco.

GRANITE
California Granite Co., Gen. Contractors' Ass'n, San Francisco.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

GRAVEL AND SAND
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.
Del Monte White Sand, sold by Del Monte Properties Co., Crocker Bldg., San Francisco.

GYMNASIUM EQUIPMENT
Ellery Arms Co., 583 Market St., San Francisco.
A. G. Spalding & Bros., 625 Market St., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Corbin hardware, sold by Palace Hardware Co., 581 Market St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora, Ill., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Parrott & Co., 320 California St., San Francisco.
Strahle Hardwood Company, First street, near Broadway, Oakland.
E. L. Bruce Company, American oak flooring, Memphis, Tenn.

HEATERS—AUTOMATIC, GAS, ELECTRIC
Electric Sales Service Co., mfrs. of Therm-elect Water Heater, West Berkeley.
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.
Ra-Do Fumeless Gas Heater, sold by Baird-Bailhache Company, 478 Sutter St., San Francisco.
Wm. J. Schwerin, Ag't Hulbert Electric Steam Radiator, Rialto Bldg., San Francisco.

HEATING AND VENTILATING CONTRACTOR'S, EQUIPMENT, ETC.
Atlas Heating and Ventilating Company, Inc., Fourth and Freelon streets, San Francisco.
Alex Coleman, 706 Ellis St., San Francisco.
C. A. Dunham Co., Sheldon Building, San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
General Boilers Co., 332 Monadnock Bldg., San Francisco.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Lawson & Drucker, 450 Hayes St., San Francisco.
James A. Nelson, 517 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Mechanical Engineering & Supply Co., 908 7th St., Sacramento.
Scott Company, 243 Minna St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
Griffin Sheet Metal Works, Fresno.
W. H. Picard and F. J. Edwards, 5656 College Ave., Oakland.

HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O'Farrell street, San Francisco.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 553 Mission St., San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant streets, San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSURANCE BROKERS
William Healey & Son, Crocker Bldg., San Francisco.

INTERIOR DECORATORS
Atherly Bros., 2032 Polk St., San Francisco.
Martin & Frederick, 1374 Sutter St., San Francisco.
John Breuner Co., 281 Geary St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

KITCHEN CABINETS
Hoosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.

LANDSCAPE ARCHITECT
Emerson Knight, 704 Market street, San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING AND PLASTERING
MacGruer & Simpson, Call-Post Bldg., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.

LATHING MATERIAL
Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., Tenth St., near Bryant, San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

LIGHT, HEAT AND POWER
- Great Western Power Company, Stockton St., near Sutter, San Francisco.
- Pacific Gas & Electric Co., Sutter street, San Francisco.

LIGHTING FIXTURES
- Thomas Day Company, Mission, near Third street, San Francisco.
- Roberts Mfg. Co., 663 Mission St., San Francisco.
- Electric Appliance Co., 807 Mission street, San Francisco.

LIME
- Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
- D. N. & E. Walter & Co., 562 Mission St., San Francisco.
- The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
- W. & J. Sloane, 216 Sutter street, San Francisco.

LUBRICATING OIL STORAGE TANKS AND PUMPS
- S. F. Bowser & Co., Inc., 612 Howard St., San Francisco

LUMBER
- Dudfield Lumber Co., Palo Alto, Cal.
- Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
- Pacific Manufacturing Company, San Francisco, Oakland, Los Angeles and Santa Clara.
- Pope & Talbot, foot of Third St., San Francisco.
- Santa Fe Lumber Co., 16 California street, San Francisco.
- Sunset Lumber Company, First and Oak Sts., Oakland.

MAGNESITE FLOORING, STUCCO, ETC.
- Dorite Mfg. Co., 116 Utah Street, San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
- American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

MANTELS—WOOD, TILE, ETC.
- Mangrum & Otter, 827-831 Mission St., San Francisco.
- Fink & Schindler, 218 12th street, San Francisco.

MANUAL TRAINING EQUIPMENT
- Richards-Wilcox Mfg. Co., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.
- Smith-Booth-Usher Co., San Francisco and Los Angeles.

MARBLE
- American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
- Ray Cook Marble Company, foot of Powell street, Oakland.
- Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
- Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
- Tompkins-Kiel Marble Company, 505 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
- Fire Protection Products Co., 3117 20th St., San Francisco.
- Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
- U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
- Forderer Cornice Works, 269 Potrero avenue, San Francisco.

MILL WORK
- Dudfield Lumber Co., Palo Alto, Cal.
- Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
- National Mill and Lumber Co., San Francisco and Oakland.
- The Fink & Schindler Co., 218 13th St., San Francisco.
- Lannom Bros. Mfg. Co., 5th and Magnolia sts., Oakland.

NOTARY PUBLIC
- William Healey & Son, 208 Crocker building, San Francisco.

OFFICE EQUIPMENT
- C. F. Weber Co., 985 Market St., San Francisco.
- Rucker-Fuller Co., 677 Mission St., San Francisco.
- F. W. Wentworth & Co., 539 Market St., San Francisco.
- Stewart Sales Co., 247 Rialto Bldg., San Francisco.

OIL BURNERS
- Bunting Iron Works, 1215 First Nat. Bank bldg., San Francisco.
- Fess System Co., 220 Natoma St., San Francisco.
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- T. P. Jarvis Manufacturing Co., 275 Connecticut St., San Francisco.
- G. E. Witt Co., 862 Howard St., San Francisco.
- W. S. Ray Manufacturing Co., 29 Spear street, San Francisco.
- F. L. Warner, 696 20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
- S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE.
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Federal Ornamental Iron and Bronze Co., 16th St. and San Bruno Ave., San Francisco.
- Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
- Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.
Hill, Hubbell & Company, 115 Davis street, San Francisco.
Wadsworth, Howland Co., makers of Bay State Brick and Cement Coating, Boston, Mass.
James Hambly & Son, Distributors in San Francisco and Los Angeles.

PAINTING, TINTING, ETC.
Atherly Bros., 2032 Polk St., San Francisco.
Wayne & Williams, 1914 Fillmore St., San Francisco.
I. R. Kissel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
The Tormey Co., 681 Geary St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 414-424 Ninth St., San Francisco.
Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco and all principal coast cities.
R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
W. P. Fuller & Co., all principal Coast cities.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PARTITIONS—FOLDING AND ROLLING
J. G. Wilson Corporation, 600 Metropolitan Bldg., Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Francisco.

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS
Victory Manufacturing Co., Monadnock building, San Francisco.

PLASTER
"Arden" brand. A. C. Robertson, Builders Exchange, San Francisco. U. S. Gypsum Co.

PLASTERING CONTRACTORS
A. Knowles, Call building, San Francisco.
MacGruer & Simpson, 266 Tehama street, San Francisco.

PLAYGROUND APPARATUS
A. G. Spalding & Bros., 625 Market St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Thos. Brodie, 2119 Fillmore street, San Francisco.
Gilley-Schmid Company, 198 Otis street, San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College avenue, Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
All-In-One Plumbing Fixture Corporation, 231 Oschner building, Sacramento.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 553 Mission St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
Standard Metals Mfg. Co., 1300 N. Main st., Los Angeles; 216 Hobart building, San Francisco.
Victory Mfg. Co., 423 Monadnock Bldg., San Francisco.
West Coast Porcelain Manufacturers, Rialto building, San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.

POLES AND PILING
Santa Fe Lumber Co., 16 California street, San Francisco.

POWER TRANSMITTING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PRELIMINARY ESTIMATES, VALUATIONS
Arthur Priddle, 185 Stevenson street, San Francisco.

PUBLIC QUANTITY SURVEY PLAN
Arthur Priddle, 185 Stevenson street, San Francisco.

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—HAND OR POWER, FOR OIL AND GASOLINE
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS
Arthur Priddle, 185 Stevenson street, San Francisco.

RADIATORS—ELECTRIC STEAM
William J. Schwerin, 217 Rialto Building, San Francisco.

RADIATOR TRAPS
C. A. Dunham Co., Sheldon Bldg., San Francisco.

REINFORCING STEEL
Edward L. Soule, Rialto Building, San Francisco.
Badt-Falk & Co., Call Bldg., San Francisco.
Gunn, Carle & Co., Inc., 444 Market street, San Francisco.
Pacific Coast Steel Co., Rialto Building, San Francisco.
Truscon Steel Co., 527 10th St., San Francisco.

REFRIGERATORS
McCray Refrigerator Company, San Francisco office, 765 Mission street.

ROCK AND GRAVEL
Coast Rock & Gravel Co., Call Bldg., San Francisco.

ROOFING CONTRACTORS
Bender Roofing Company, Monadnock Bldg., San Francisco.
Hill, Hubbell & Co., 115 Davis street, San Francisco, and San Fernando Bldg., Los Angeles.

ROOFING AND ROOFING MATERIALS
"Malthoid" and "Ruberoid," also "Pabco" ten and twenty year roofs, manufactured by the Paraffine Companies, Inc., San Francisco.
United Materials Co., Sharon Bldg., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAND
Coast Rock & Gravel Co., Call Bldg., San Francisco.
Del Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, San Francisco and Los Angeles.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 985 Market St., San Francisco; 512 S. Broadway, Los Angeles.
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.
Stewart Sales Co., 247 Rialto Building, San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The Paraffine Companies, Inc., 34 First St., San Francisco.

SHEET METAL WORK
Forderer Cornice Works, 269 Potrero ave., San Francisco.
Griffin Sheet Metal Works, Fresno, Cal.
Pacific Heating Company, Second and Grove streets, Oakland.
U. S. Metal Products Co., 330 10th street, San Francisco.
Fire Protection Products Co., 3117 20th street, San Francisco.

SHINGLE STAINS
Bass-Hueter Paint Company, all principal Coast cities.
Cabot's Creosote Stains, sold by Pacific Building Materials Co., 525 Market St., San Francicco.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—COMPOSITION, UNIT AND STRIP
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

SINKS—COMPOSITION
Petrium Sanitary Sink Co., Fifth and Page Sts., Berkeley.

STEEL HEATING BOILERS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 444 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Benson & Benson, The Alameda, San Jose.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco, and Key Route Fell, Oakland.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Hill, Hubbell & Company, 115 Davis St., San Francisco.

STEEL ROLLING DOORS
Pacific Building Materials Co., Underwood Bldg., San Francisco.
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles Waterhouse-Wilcox Co., San Francisco
Rolph, Mills & Co., San Francisco, Los Angeles, Portland and Seattle.

STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 525 Market St., San Francisco.
"Lupton" steel sash, Waterhouse-Wilcox Co., agts., San Francisco, Los Angeles and San Diego.
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich. Direct factory sales office, Foxcroft Bldg., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS
Zouri Safety Sash Bars—Cobbledick-Kibbe Glass Company, 175 Jessie St., San Francisco.

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SUMP AND BILGE PUMPS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

SWITCHES AND SWITCHBOARDS
Wemco Safety Switch, manufactured and sold by W. E. Mushet Co., 502 Mission St., San Francisco.
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer's Safety Switch Co., 575 Howard Street, San Francisco.
Unit Electric Co., 450-60 Natoma Street, San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market street, San Francisco.
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannon & Co., Sacramento; and 77 O'Farrell St., San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.
United Materials Co., Sharon Bldg., San Francisco.

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los Angeles, Portland and Seattle.

VALVES—PIPES AND FITTINGS
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
H. Mueller Mfg. Co., 635 Mission street, San Francisco.
W. E. Mushet Co., 502 Mission St., San Francisco
Victory Manufacturing Co., Monadnock building, San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.
Everlasting Blow-off Valves. General Machinery and Supply Co., 39 Stevenson street, San Francisco.

VARNISHES
Bass-Hueter Paint Company, Mission, near 4th street, San Francisco, and all principal coast cities.
W. P. Fuller Co., all principal Coast cities.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, 55 Stevenson St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
C. F. Weber & Co., 985 Market St., San Francisco.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, Rialto Building, San Francisco.

WALL BEDS, SEATS, ETC.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

WALL BOARD
"Amiwud" and "Pabco," manufactured by The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.

WALL PAPER AND DRAPERIES
The Tormey Co., 681 Geary St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Francisco.
Uhl Bros., San Francisco.

WATERPROOFING (see Damp-proofing)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL
"Gold Seal," manufactured and sold by Bass-Hueter Paint Co. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

WINDOW SASH CHAIN
The Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, 507 Mission street, San Francisco, and I. W. Hellman Bldg., Los Angeles.

WINDOW SHADES
W. & J. Sloane, 216 Sutter street, San Francisco.
D. N. & E. Walter, 562 Mission street, San Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Waterhouse & Wilcox, San Francisco, representatives.
Hauser Window Co., 157 Minna St., San Francisco.
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Francisco.

WIRE FENCE
Standard Fence Co., 245 Market street, San Francisco; and 310 12th street, Oakland.

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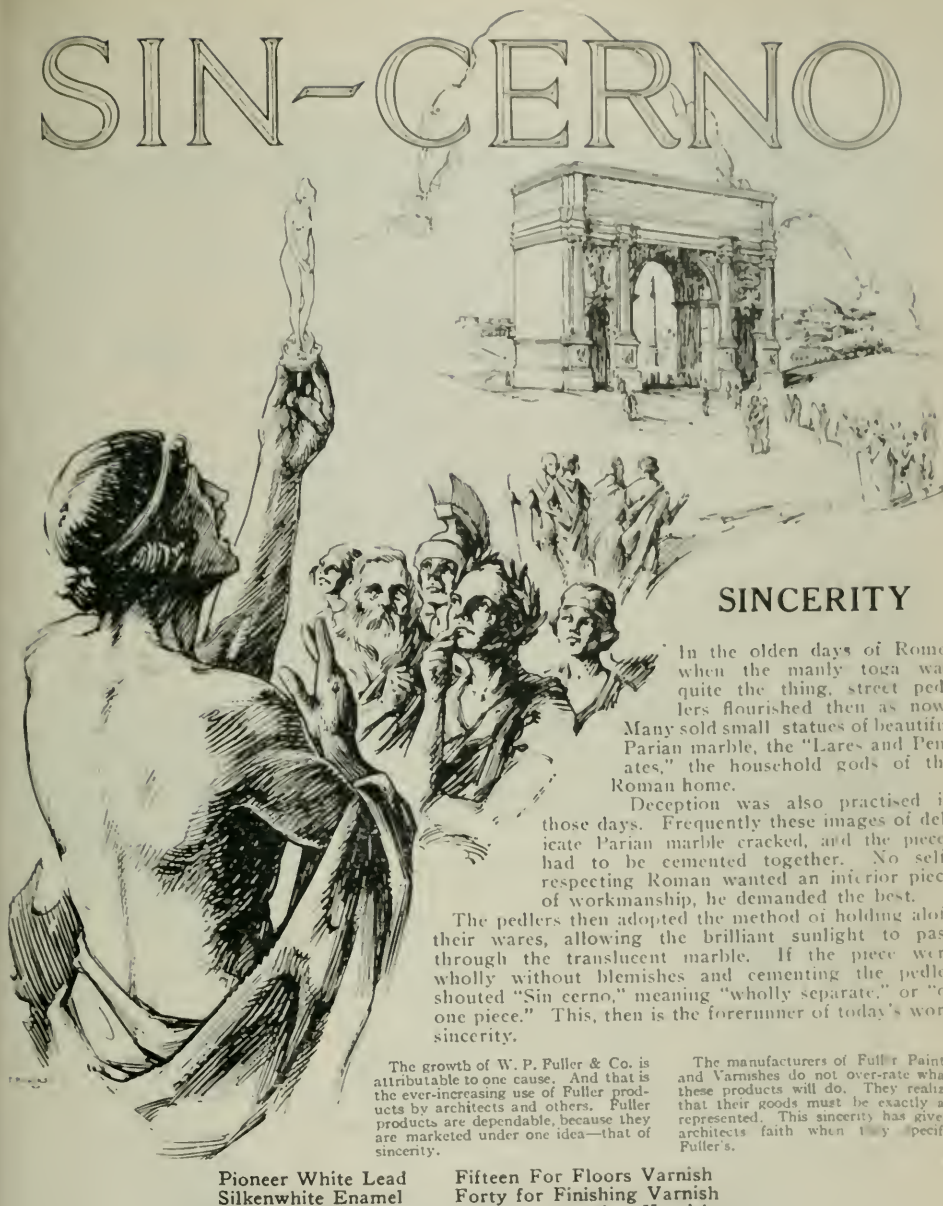

SINCERITY

In the olden days of Rome, when the manly toga was quite the thing, street peddlers flourished then as now. Many sold small statues of beautiful Parian marble, the "Lares and Penates," the household gods of the Roman home.

Deception was also practised in those days. Frequently these images of delicate Parian marble cracked, and the pieces had to be cemented together. No self-respecting Roman wanted an inferior piece of workmanship, he demanded the best.

The peddlers then adopted the method of holding aloft their wares, allowing the brilliant sunlight to pass through the translucent marble. If the piece were wholly without blemishes and cementing the peddler shouted "Sin cerno," meaning "wholly separate," or "of one piece." This, then is the forerunner of today's word sincerity.

The growth of W. P. Fuller & Co. is attributable to one cause. And that is the ever-increasing use of Fuller products by architects and others. Fuller products are dependable, because they are marketed under one idea—that of sincerity.

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Silkenwhite Enamel
Fullerwear Varnish
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Forty for Finishing Varnish
Fifty For Flatting Varnish
Concreta

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SAN DIEGO
HOLLYWOOD
LONG BEACH
WALLA WALLA
SEATTLE
PASADENA
PORTLAND
FRESNO
SALT LAKE CITY

Rustication around entrance, New Administration Building, Globe Indemnity Company, Washington Park, Newark, N. J.

Mr. Frank Goodwillie, New York City, Architect. *Waterproofed Medusa Stainless White Cement* was used in mortar to set limestone facing of the entire lower half of the structure. Materials furnished by Tomkins Brothers of New York, Newark and Philadelphia.

THE ARCHITECT AND ENGINEER

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ENTRANCE FROM BUILDING ROTUNDA, FIRST NATIONAL BANK, SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT

THE
ARCHITECT
AND
ENGINEER

FEBRUARY
1922

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The First National Bank of San Francisco

By FREDERICK HAMILTON

SAN FRANCISCO'S oldest National Bank is the most recent to install itself in new quarters. With the completion of the additions to the First National Bank building at the corner of Post and Montgomery streets, the Bank enters spacious and sumptuous quarters which embody the latest developments in banking organization and equipment, while the affiliated First Federal Trust Company, hitherto confined within an area which now becomes no more than a vestibule to the new building, takes possession of the entire area formerly occupied by the parent organization.

The First National Bank of San Francisco is one of California's oldest banking institutions, and was founded by figures prominent in the State's early financial history. It was organized on October 20, 1870, in the Exchange Building, now the Merchants' Exchange Building, on California street. A charter was obtained from the Government, and the bank opened for business on January 3, 1871, under the name of the First National Gold Bank. The original quarters were at 403 Montgomery street. A few years later the institution moved into the Nevada building, and occupied the corner at Montgomery and Summer streets.

The Bank's first president was Mr. James Phelan (father of former Senator Phelan), and the original board of directors was as follows: Messrs. James Phelan, D. Driscoll, C. G. Hooker, J. B. Felton, M. P. Jones, D. D. Colton, James Moffitt, C. F. Mac Dermott, Edward Martin, D. Callaghan, N. Van Bergen, Samuel Hort, J. C. Flood, J. H. Wise, N. K. Masten, George F. Hooper.

The second president was Mr. George F. Hooper, the father of Mr. J. G. Hooper, manager of the First Federal Trust Company. One of the first cashiers was Mr. R. C. Woolworth. He was later made president, and remained with the First National Bank for seven years. He then resigned and organized the firm of Crocker, Woolworth and Company, Bankers. Mr.

D. Callaghan was elected to fill the vacancy of president. He remained president for five years, and was followed by Mr. S. G. Murphy.

In 1889 the Bank built a new home at the corner of Bush and Sansome streets, on the present site of the Standard Oil building. This building was occupied until 1909, when the present structure at the corner of Post and Montgomery streets was completed.

In 1907 the First Federal Trust Company was organized by the stockholders of the First National Bank, and occupied a portion of the Bank's new building. The growth of the First Federal Trust Company was rapid until after the purchase of the Mutual Savings Bank, one of San Francisco's

TRANSIT DEPARTMENT
First National Bank of San Francisco

oldest banking institutions, its quarters became quite inadequate. The board of directors therefore purchased one hundred feet of land adjoining the building throughout its length from Montgomery street to Lick place, and erected thereon an annex as a new home for the First National Bank, while the First Federal Trust Company occupies the quarters from which the Bank has withdrawn.

Mr. Charles E. Gottschalk was entrusted with the designing of the new First National Bank. At its inception this task was beset with a perplexing decision between alternatives which would not be encountered in out-and-out new work. The new building was to be a two-story addition to a twelve-story structure previously designed by Willis Polk and Company, joining the old building on the Montgomery street facade, on the exterior

rotunda and on the interior elevator lobby. Three courses of procedure were open: the original design might be entirely disregarded except at the actual points of contact; the essential lines and large elements of the old building might be maintained without prejudice to a complete freedom in handling; or the entire existing architectural apparatus might be adopted *in toto*.

On its face the second alternative would seem to point the most promising course; although it would be impossible, without a knowledge of many circumstances denied an outsider, to say that Mr. Gottschalk was wrong in choosing the third. There may have been practical considerations

BOOKKEEPING DEPARTMENT
First National Bank of San Francisco

making it the most expedient policy; or there may have been sentimental reasons dictating an architectural treatment identical with that long associated with the Bank, and still maintained in the affiliated institution across the lobby. On the exterior the result is not entirely happy. Whatever the merits of the facade as a facade, its junction with the tall building is not altogether convincing. The sturdy two storied base, slipping out into the open from under ten stories of office building, gives the impression that it is only waiting its turn for a similar superposition. The interior is splendid. It has an air of pomp and sumptuousness befitting an important institution of its kind; it has, above all, a sense of spaciousness and airiness which is refreshing. One feels free to walk in more than one direction, and able to breathe amply while doing it.

On the technical side the new bank represents the most modern development in banking organization and equipment. The open officers' island in the midst of the public space is the first example in the West of an arrangement which has found favor in recent Eastern banks. The same is true of the layout of the receiving and paying wickets into three units segregated alphabetically—in effect three independent banks. This arrangement, which will be readily understood by reference to the plan on page 59, has the advantage of reducing to one third the number of people with whom any one teller must deal. No operating equipment whatever is housed on the first floor. All work, save that in which the public is actually involved is done on the second floor, entirely out of the public view. All work is carried from the windows on the main floor by

FIRST NATIONAL BANK OF SAN FRANCISCO
Original Building, Willis Polk & Company, Architects.
Addition, Charles E. Gottschalk, Architect.

pneumatic tubes to a central or receiving department on the second floor, where it is proven and sent on to the proper departments, which are arranged in orderly sequence, interior on one side and outgoing on the other. The careful and logical arrangement of the work departments will be understood from the layout on page 58.

The Bank provides a lunch room for employees who desire to use it, and also club rooms where the latest periodicals on education and financial matters can be found. The employees take care of their own welfare work through the medium of the First National Bank Club. All officers and directors of this club are elected by the staff from its own membership, but one officer of the Bank is allowed to sit upon the board. A house organ known as "Eleven-Eight" (the transit number of the First National Bank) is published at intervals, containing items of interest about the staff and as a rule one or two educational articles.

1870 - 1876

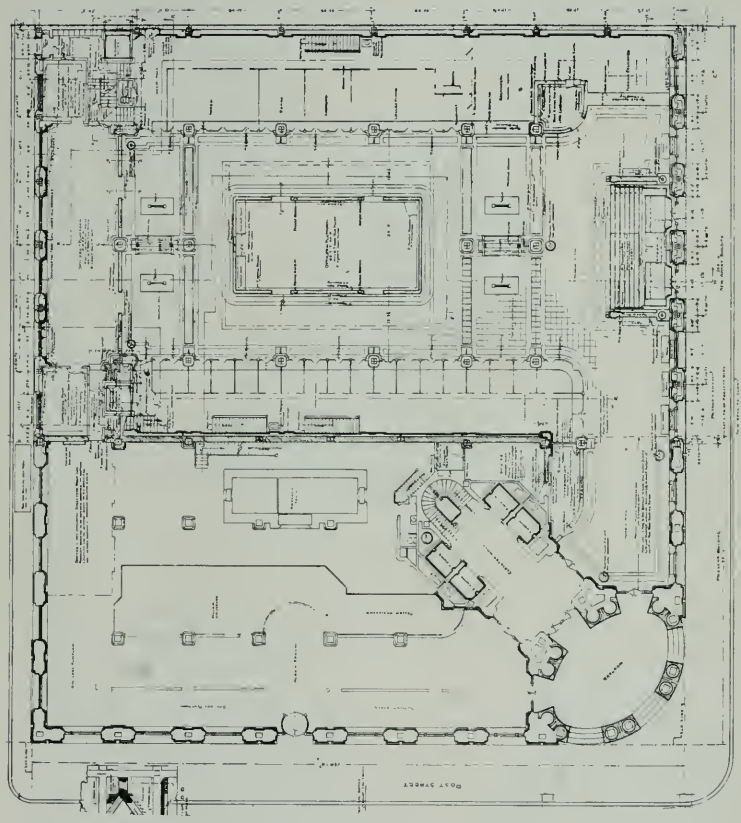
1879 - 1880

1921

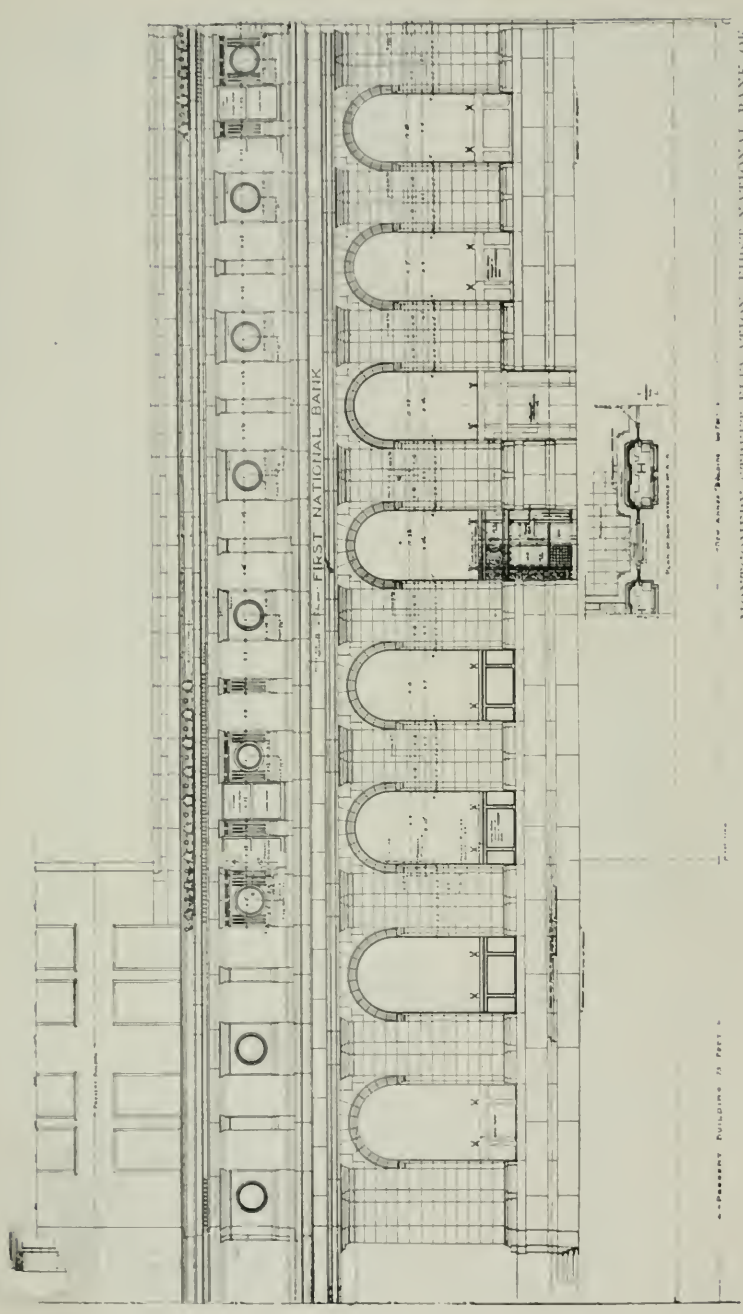
1889 - 1909

1909 - 1920

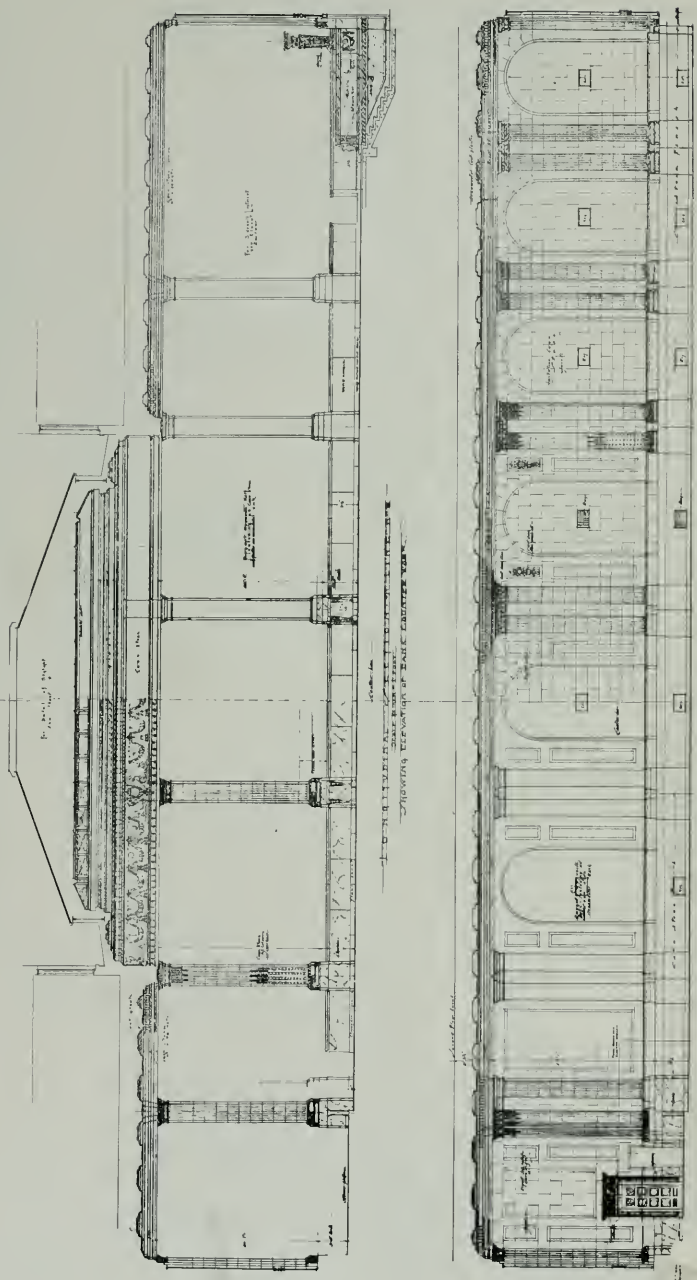
PRESENT AND FORMER HOMES OF THE FIRST NATIONAL BANK OF SAN FRANCISCO



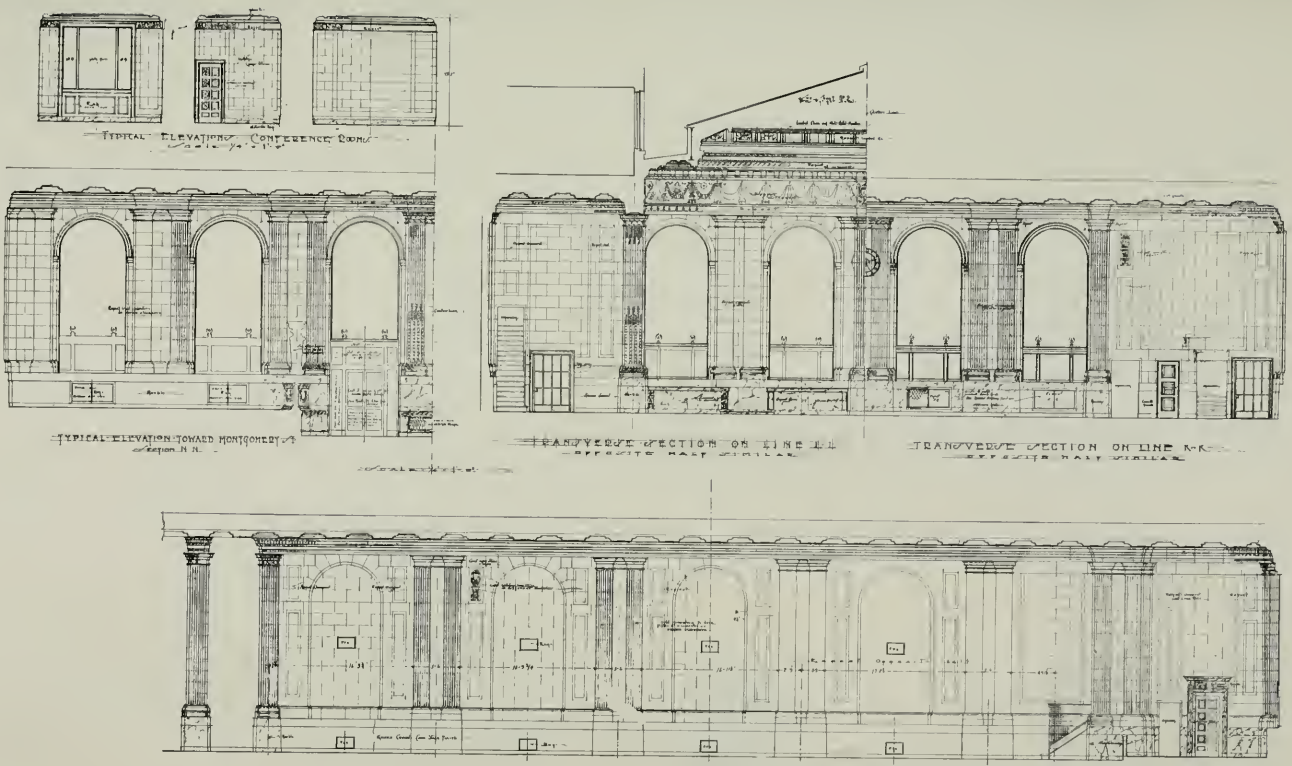
PLAN OF OLD AND NEW BUILDINGS, FIRST NATIONAL BANK OF SAN FRANCISCO. ORIGINAL BUILDING, WILLIS POLK & CO., ARCHITECTS. NEW BUILDING, CHARLES E. GOTTSCHALK, ARCHITECT.



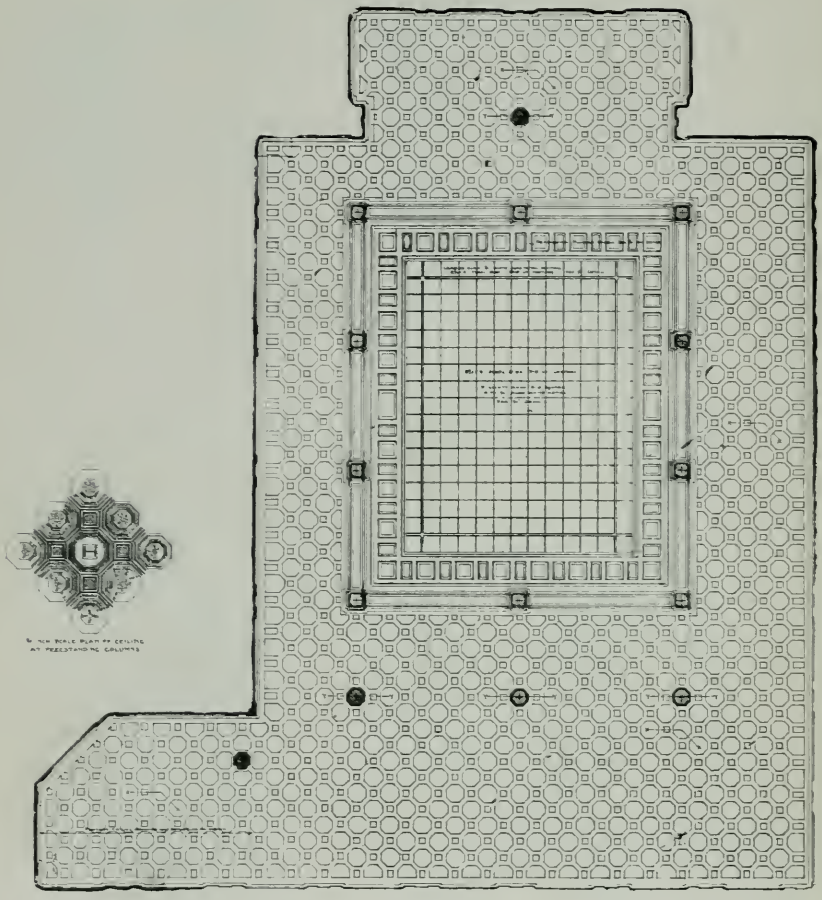
MONTGOMERY STREET ELEVATION, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT



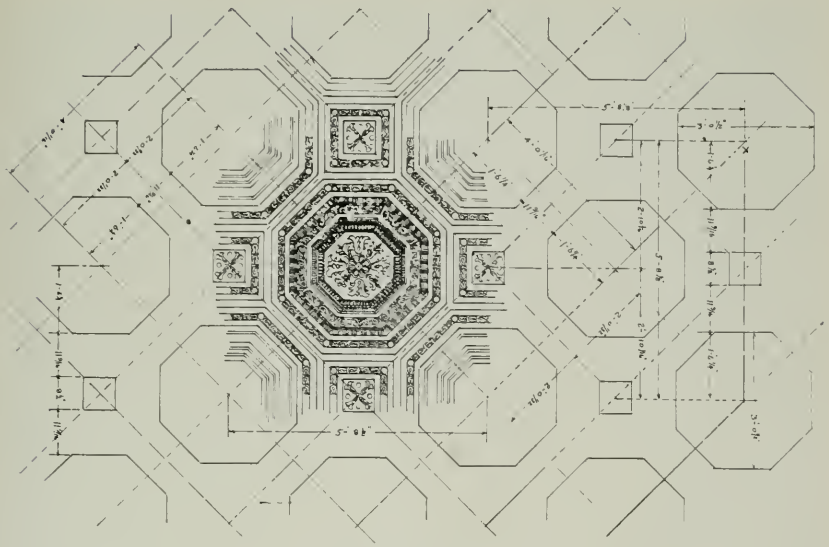
INTERIOR ELEVATIONS, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT



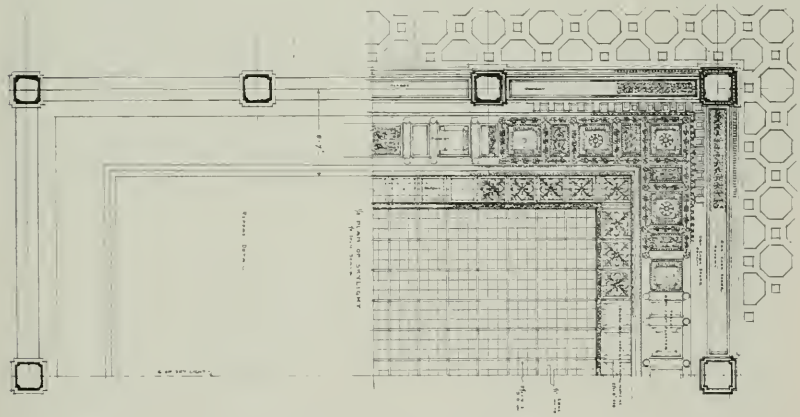
INTERIOR ELEVATIONS, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT



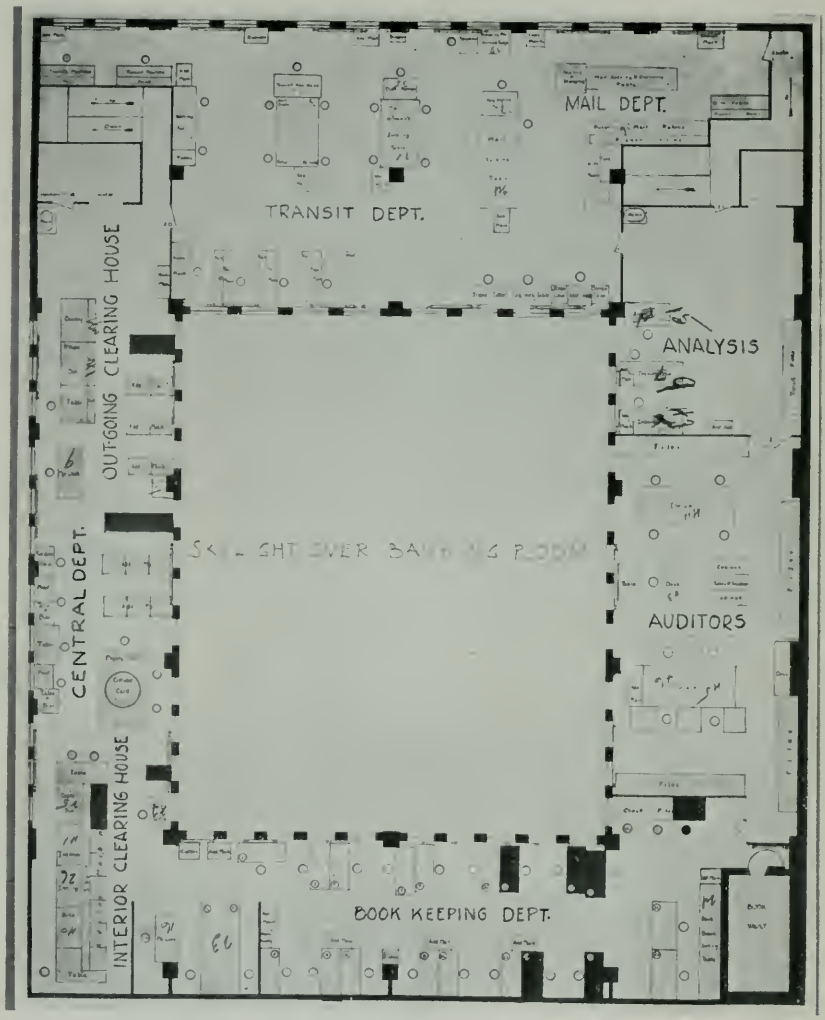
CEILING PLAN, FIRST NATIONAL BANK OF SAN FRANCISCO
CHARLES E. GOTTSCHALK, ARCHITECT



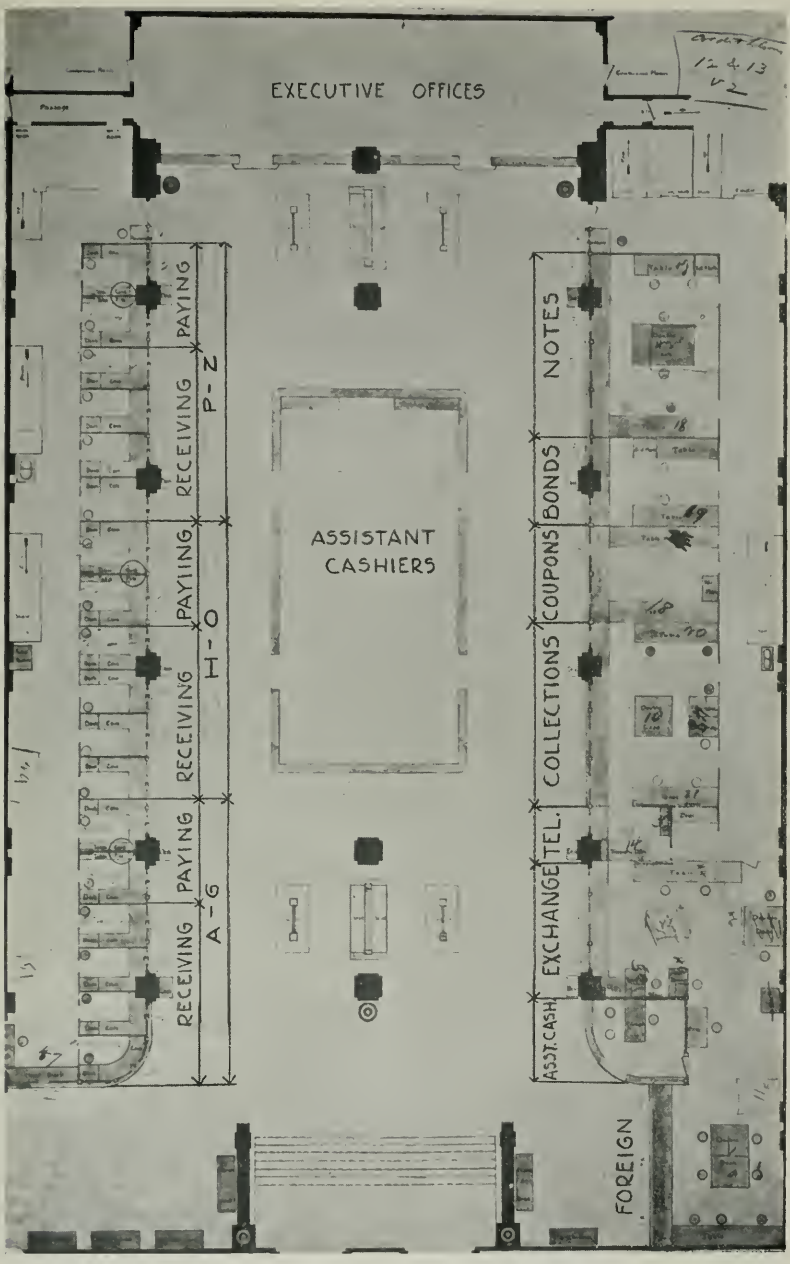
CEILING DETAIL



CENTRAL SKYLIGHT DETAIL, FIRST NATIONAL BANK OF SAN FRANCISCO
Charles E. Gottschalk, Architect

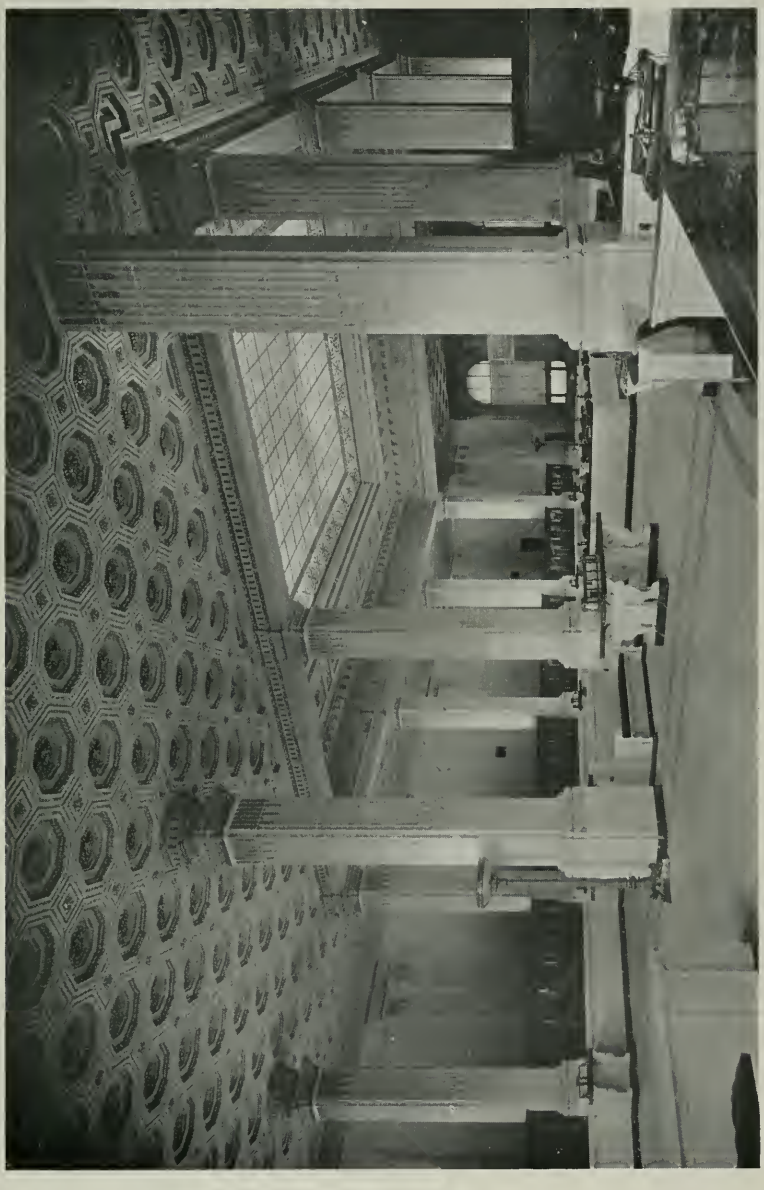


LAYOUT OF WORK SPACE, SECOND FLOOR, FIRST NATIONAL BANK OF SAN FRANCISCO

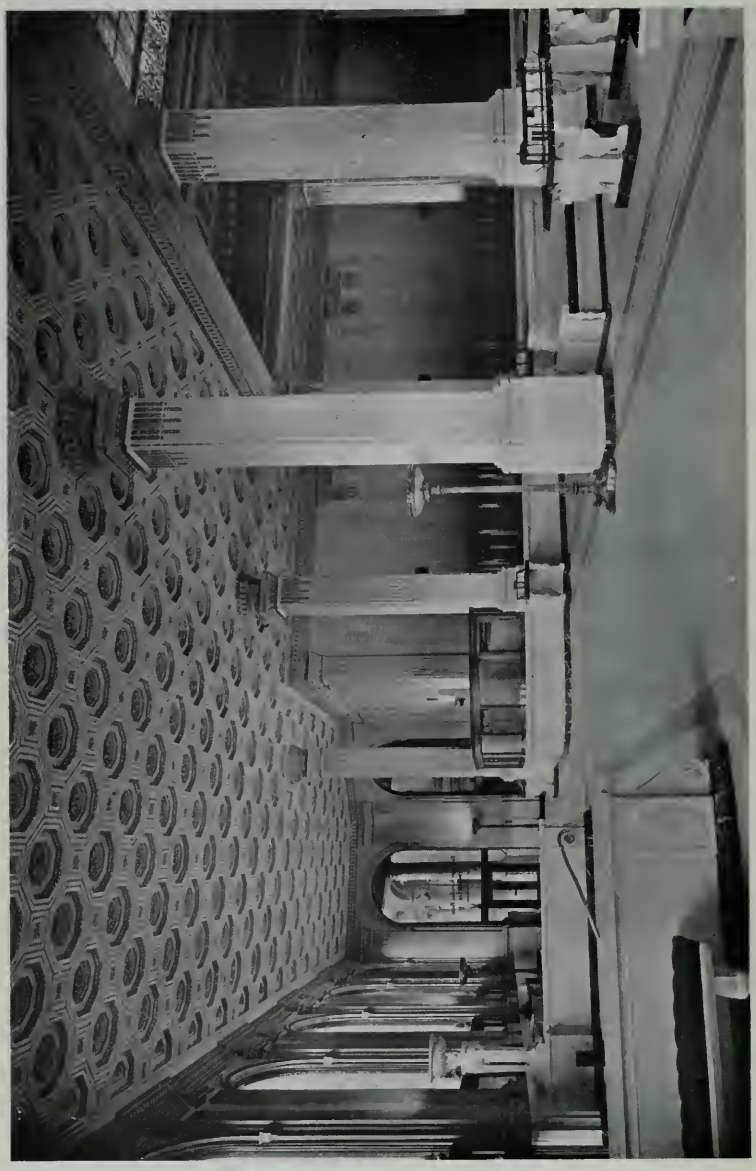


LAYOUT OF PUBLIC BANKING ROOM, FIRST FLOOR, FIRST NATIONAL BANK OF SAN FRANCISCO

NIGHT LIGHTING, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT



FIRST NATIONAL BANK OF SAN FRANCISCO
CHARLES E. GOTTSCHALK, ARCHITECT



FIRST NATIONAL BANK OF SAN FRANCISCO
CHARLES E. GOTTSCHALK, ARCHITECT

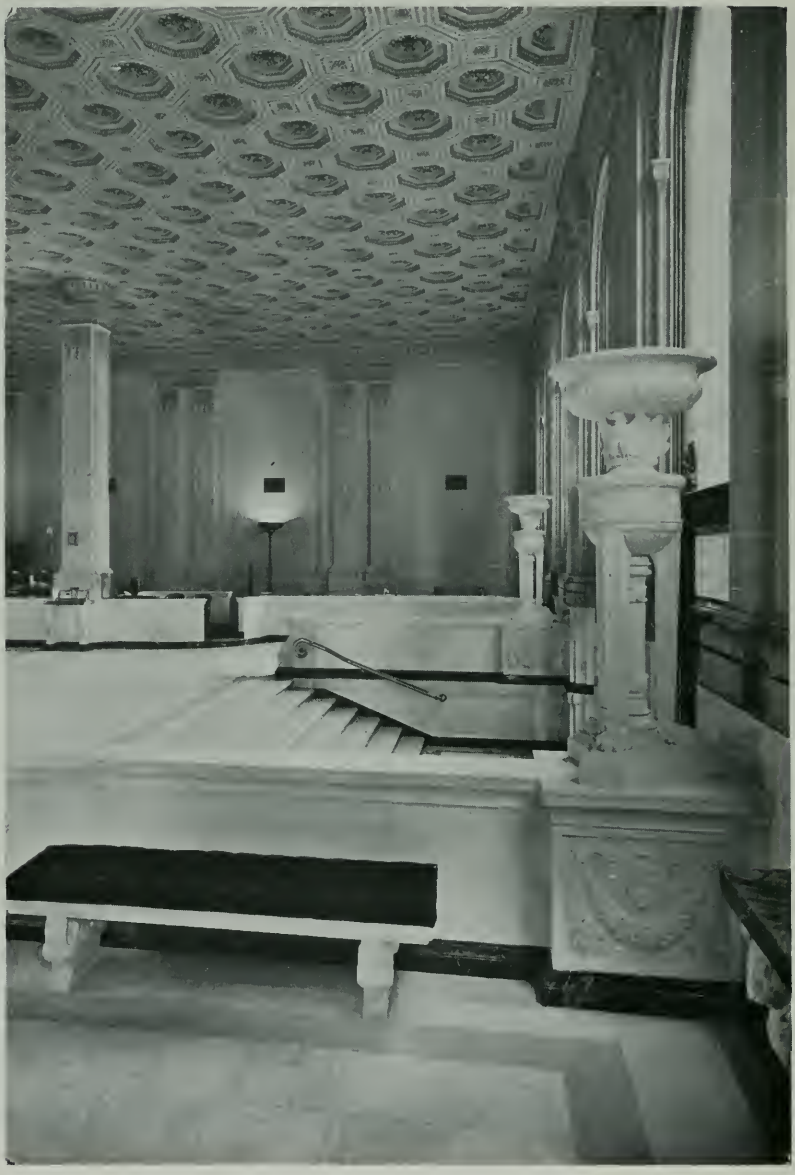
ASSISTANT CASHIER'S ISLAND, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT

EXECUTIVE PLATFORM, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT

WRITING COUNTERS AND EXECUTIVE PLATFORM, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT

BANK SCREEN AND WRITING COUNTER, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT

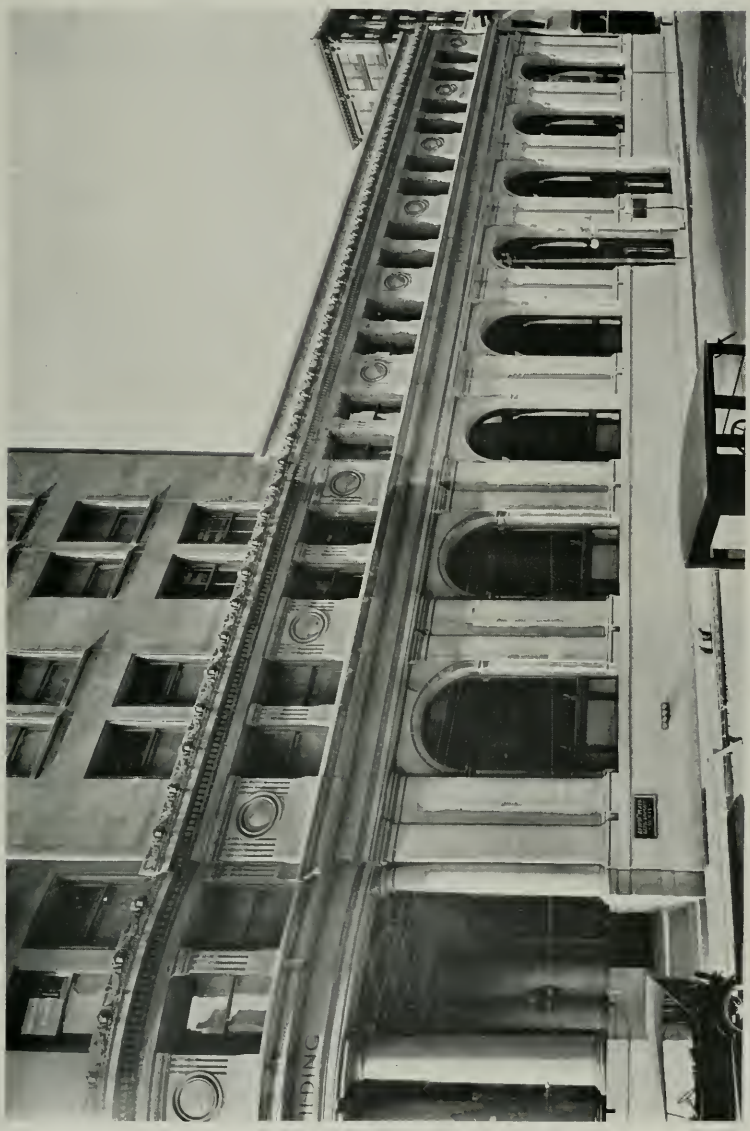
CASHIER'S DESK, FIRST NATIONAL BANK OF SAN FRANCISCO
CHARLES E. GOTTSCHALK, ARCHITECT



MONTGOMERY STREET ENTRANCE, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT

MONTGOMERY STREET ENTRANCE, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT

DIRECTORS' ROOM, FIRST NATIONAL BANK OF SAN FRANCISCO. CHARLES E. GOTTSCHALK, ARCHITECT



FIRST NATIONAL BANK OF SAN FRANCISCO
CHARLES E. GOTTSCHALK, ARCHITECT

CLEARING HOUSE

AUDITING DEPARTMENT, FIRST NATIONAL BANK OF SAN FRANCISCO

MAILING DEPARTMENT

CAGE IN WORK SPACE, FIRST NATIONAL BANK OF SAN FRANCISCO

Cooperation Between the Architect and the Mechanical Engineer

"A wise old owl sat on a limb
The more he saw the less he said
The less he said the more he heard
Why can't you be like that old bird?"

A CURIOUS bit of nonsense, isn't it? Perhaps it isn't even quoted correctly. And it doesn't mean anything—or does it? Possibly the author really did have a thought to express and took this way of doing it. But whether he did or not, it has no bearing on the subject of cooperation between the architect and the engineer.

What is the relation between these two? They meet on the street or in the club, speak, and part, each to go about his own line of work—the architect to take a pile of lumber, a few bricks, a little cement, etc., and make a building of them; the engineer to put into that building a little plumbing, a little heating equipment and a little electric wiring and to aid in making it a habitable structure. The architect and the engineer together have, by their skill, transformed the raw materials into a beautiful and comfortable building, to reflect great credit on each of them.

Perhaps the architect could have done as much alone. But, could he have done it as well? Primarily, his work lies in designing and erecting a structure which is harmonious and pleasing to the senses,—his training has been along these lines, rather than along the more utilitarian lines followed by the engineer. It is difficult for him to combine these lines of work,—his time is too much occupied, and rightly, in attaining the desired end architecturally to permit the proper consideration of engineering problems, and they are necessarily slighted. It is here that the engineer can be of great help, for, working with the architect, he can give to the engineering questions the study which they require and can evolve a solution which will harmonize with the architectural design. Each is learning more and more that his line of work is only a part of the whole and that the work of his associate is as essential as his own. Moreover, each feels that he needs the other, that he is unable, alone, to achieve the results desired. This feeling has now passed out of the formulative stage and the wholesome respect which each has for the work of the other, is growing stronger day by day. It will inevitably lead to a fuller understanding and closer cooperation between the architect and the engineer in advancing building design and construction.—Chicago Association of Consulting Engineers, in the Illinois Society of Architects' Monthly Bulletin.

* * *

Medium Cost Homes

AN increasing demand for low and medium-priced homes prompts The Architect and Engineer to devote more space to illustrating houses and bungalows in this class. Commencing in March, this magazine proposes to publish monthly, without comment, several houses ranging in cost from $5,000 to $15,000. Perspectives, elevations, plans and views taken after completion will be shown, and architects are invited to contribute any interesting designs which they have built. Photographs are desired from different localities and all forms of construction, either frame, concrete, brick, adobe or hollow tile, will be acceptable. A wide variance of style naturally will add interest and value to the contributions.

Competition for St. John's Church, Los Angeles

DURING the latter part of 1921 an important competition was held in Los Angeles for the selection of an architect to design a new building for St. John's Church. The competition was conducted with Mr. Edwin Bergstrom as professional advisor, and limited to the following invited architects: Messrs. Allison & Allison, Los Angeles; Pierpont and Walter S. Davis, Los Angeles; Robert D. Farquhar, Los Angeles; Lyman Farwell, Los Angeles; Reginald Johnson, Pasadena; Montgomery & Nibecker, Los Angeles. Mr. Farwell subsequently withdrew.

The complete drawings of each of the remaining five competitors are here reproduced. The pertinent portions of the program, together with the report of the jury, are also reprinted, in order to render possible an intelligent study of the drawings.

ARTICLE I.

The St. John's Church proposes to erect for its own use a group of buildings, consisting of three principal units—a Church, a Rectory and a Parish House, and the building, rooms and passages supplementary and appurtenant thereto as hereinafter described on its property at the southeast corner of Figueroa and West Adams streets.

ARTICLE II.

The owner, not having funds in hand nor in immediate prospect sufficient to complete the entire group of buildings at the present time, will adopt a plan which correlates all units of said group, but will devote its funds in hand to the erection of the Church unit only, together with the appurtenant rooms and passages which are a part thereof, and which are more fully described in Section 5 of Article 16. No other buildings or part thereof will be erected at present.

ARTICLE 16.

Section 4. Toilet facilities and other accessories, stacks, stairs and other minor parts where not fixed in this Article 16 are left to the discretion of the competitor, but it is essential that ample provision shall be made therefor.

Section 5. The essential requirements of the Church unit are as follows, to-wit:

(a) It is mandatory that there be a basement of sufficient size to contain a:

(a-1) A boiler or furnace room of sufficient size to contain heating and fuel equipment for the entire Church unit, but the equipment is not to be shown.

(a-2) A room for storage purposes containing approximately 1250 sq. ft. of floor area.

(b) It is mandatory that the Church proper shall be of nave and transept form and that the appurtenant rooms and parts (b-1) to (b-11) inclusive shall be provided.

(b-1) Mortuary Chapel—To seat 10 to 20 people, with altar and casket space in front of altar.

(b-2) A Memorial Chapel—To seat 90 to 110 people, with an altar and communion rail.

(b-3) One choir room for 20 men, with lockers and toilet.

(b-4) One choir room for 20 women, with lockers and toilet.

(b-5) One choir room for 20 boys, with lockers and toilet.

(b-6) One acolyte room for 40 boys, with lockers and toilet.

(b-7) One altar guild room for arranging flowers, trimming of candles, keeping of altar hangings, and the polishing of brasses, etc.; rooms shall have storage closets thereoff; area, exclusive of closets, approximately 120 sq. ft.

(b-8) One sacristy of clear floor area not less than 10 feet by 10 feet.

(b-9) One high altar which shall be at least nine steps above the floor of the nave.

(b-10) A chancel (which shall not be a recess or apse-chancel) to seat 40 to 60 of a choir.

(b-11) An organ loft.

(b-12) It is desired to seat at least 750 people in the nave of the Church, but it is MANDATORY that every seat in the nave shall have a full view of the altar. A balcony at rear of the nave will be permitted.

Section 6. The essential requirements of the Parish House unit are as follows, to-wit:

(a) The Parish House unit will eventually contain:

(a-1) Assembly hall to seat 400 to 500 people.

(a-2) Gymnasium, which may be incorporated in Assembly hall.

(a-3) Kindergarten room for 75 children.

(a-4) Kitchen to serve Assembly hall and Kindergarten.

(a-5) Club rooms for billiards, cards and reading.

(b) It is mandatory, that the cubical contents of this unit as described in paragraph (a) to (a-5) of this section shall not exceed 250,000 cu. ft.

(c) It is a mandatory requirement that no interior arrangements of this unit shall be shown, and the rooms listed in (a) hereof are described only for the purpose of aiding the competitors in formulating the area and mass of the unit.

(d) It is not essential that this unit be limited to one story.

Section 7. The essential requirements of the Rectory unit are as follows, to-wit:

(a) The Rectory unit will eventually contain:

(a-1) Living room.

(a-2) Dining room.

(a-3) Kitchen.

(a-4) Six (6) bedrooms.

(a-5) Three (3) bathrooms.

(b) It is mandatory, that the cubical contents of this unit shall not exceed 60,000 cu. ft.

(c) It is a mandatory requirement that no interior arrangements of this unit shall be shown, and the rooms fixed in (a) hereof are described only for the purpose of aiding the competitor in formulating the area and mass of the unit.

(d) It is not essential that this unit be limited to one story.

Section 8. The supplementary buildings and their essential requirements are as follows, to-wit:

(a) It is mandatory, that there shall be not less than ten Sunday School class rooms, each for twelve to fifteen pupils; these class rooms may also be used as guild rooms.

(b) It is mandatory, that there shall be three apartments for living purposes. One for the sexton, one for the deaconess and one for the curate; two of the apartments shall be of three rooms each, and one apartment of four rooms.

(c) It is mandatory, that there shall be a library, study and office room with general waiting room—total floor area approximately 750 sq. ft.

(d) The supplementary buildings under (a) and (b) of this section may be placed within the Parish house unit as a part thereof, or may be distributed upon the property, with proper connectives, at the option of the competitor. If placed within and as a part of the Parish house unit, the cubage of the Parish house unit must be correspondingly increased. The supplementary buildings under (c) of this section may be placed so as to connect with the Rectory unit or otherwise may be placed on the property with the proper connectives at the option of the competitor.

(e) The property not belonging to St. John's Church at the northeast corner of South Figueroa and West 27th streets may have buildings erected thereon, the character of which may not be in harmony with the group of buildings proposed for the Church. It is, therefore, desired to obliterate this possibility as much as possible by the grouping of the buildings on the Church property or by some method, other than planting, to be suggested by the competitor. A fence between the property cannot be over six feet in height.

(f) West 27th street at Figueroa is a minor street and unimportant, and any of the buildings of the Church group may or may not be brought to the property line on said street, at the option of the competitor.

(g) Language is inadequate to convey a dream, but that the competitors may know something of what is in our mind, this paragraph is added to the agreement:

We are hoping in the erection of the new Church to have a building which will express the warmth of the love of God and fellowship. The old cathedrals of Europe are wonderful because they express the mind of the builders who dreamed of the greatness and majesty and might of God. When one enters them, he is impressed with the spaciousness of the cathedral and the greatness of God and his own littleness. One is made to fell a very small human being and he feels alone. We hope that our Church may make one feel an atmosphere of worship; that he will feel immediately at home when he enters the building and somehow feel the love of the Father.

Just how this can be expressed in stone is difficult to say. That must be left to the ingenuity of the architect. We have suggested the cruciform as the foundation affording transepts. This will in a sense carry out the Anglican tradition of the Church. The transept may be deep or shallow. **We are more concerned with the acoustics** than we are with the style of architecture.

The Spanish or Mission style of architecture has been appropriated largely by the Roman Catholic Church of Southern California. We have no desire to take it from them by using it. If some means of a combination of Romanesque and Gothic can be worked out we should be gratified. We would like the stranger as he passes by and looks at the Church to have it suggest to him that this Church is not a Roman Catholic Church, but is an Episcopal Church. These are merely suggestions and are offered only with the thought in mind of conveying to the competitors something that is in the mind of the Rector and Vestry.

Report of Jury of Award.

The jury chosen by St. John's Church to select an architect for the new building met in full session, together with the professional adviser, on Wednesday, October 19, 1921, and Thursday, October 20, 1921, as required by the programme.

When the packages of drawings were examined it was found that only five of the invited competitors had submitted designs.

After proceeding to ascertain that all of the drawings had complied with all of the mandatory requirements, the merits of the various designs were discussed at length.

The method of procedure in studying the drawings was as follows:

1st. The group plan in its relation to the site.
2nd. The plan and arrangements of the Church unit proper.
3rd. The study of the designs of facades and sections.

Having considered all of these matters, separately, in detail and collectively, the jury proceeded to vote by secret ballot. One ballot was cast, resulting in the unanimous choice of the design tentatively marked number four. On opening the sealed envelopes, the successful design was found to be that of Messrs. Pierpont and Walter S. Davis.

The jury feels that the Messrs. Davis took the greatest advantage of the limitations of the site. The Church is the dominating feature of the composition on Adams street; it is retired from traffic, and flanked by the Parish House and Rectory, which form a charming forecourt, and place the Parish House in a convenient location on Figueroa street. The requirements for light and air have been solved with the maximum advantage.

The Church unit plan is compact and convenient and complies well with the requirements stated in the programme.

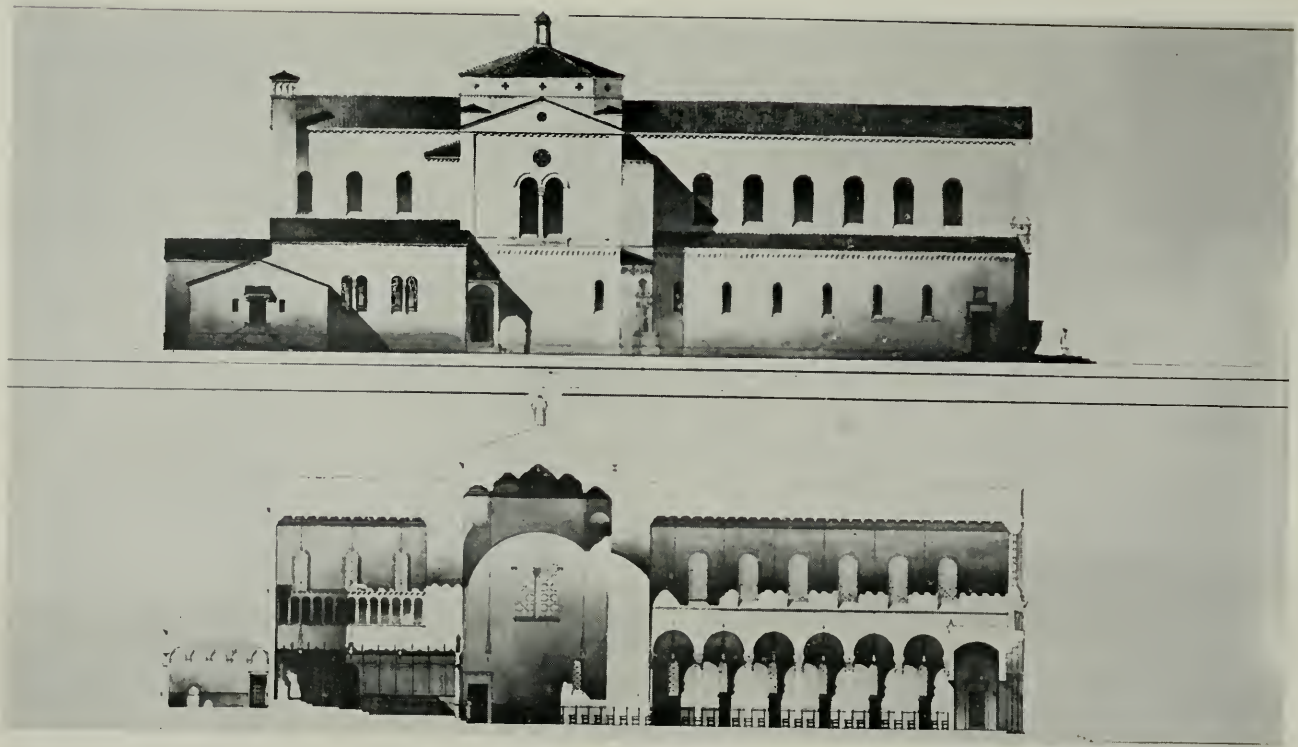
The winning design is very pleasing and harmonious, the chief elaboration being placed upon the Adams street facade, while the other facades (which in the future may be little seen) are treated with great simplicity.

In making the award the three members of the jury affirm that the identity of the authors of the drawings judged was unknown to them.

ERNEST COXHEAD,
WM. TEMPLETON JOHNSON,
REV. GEO. A. DAVIDSON.

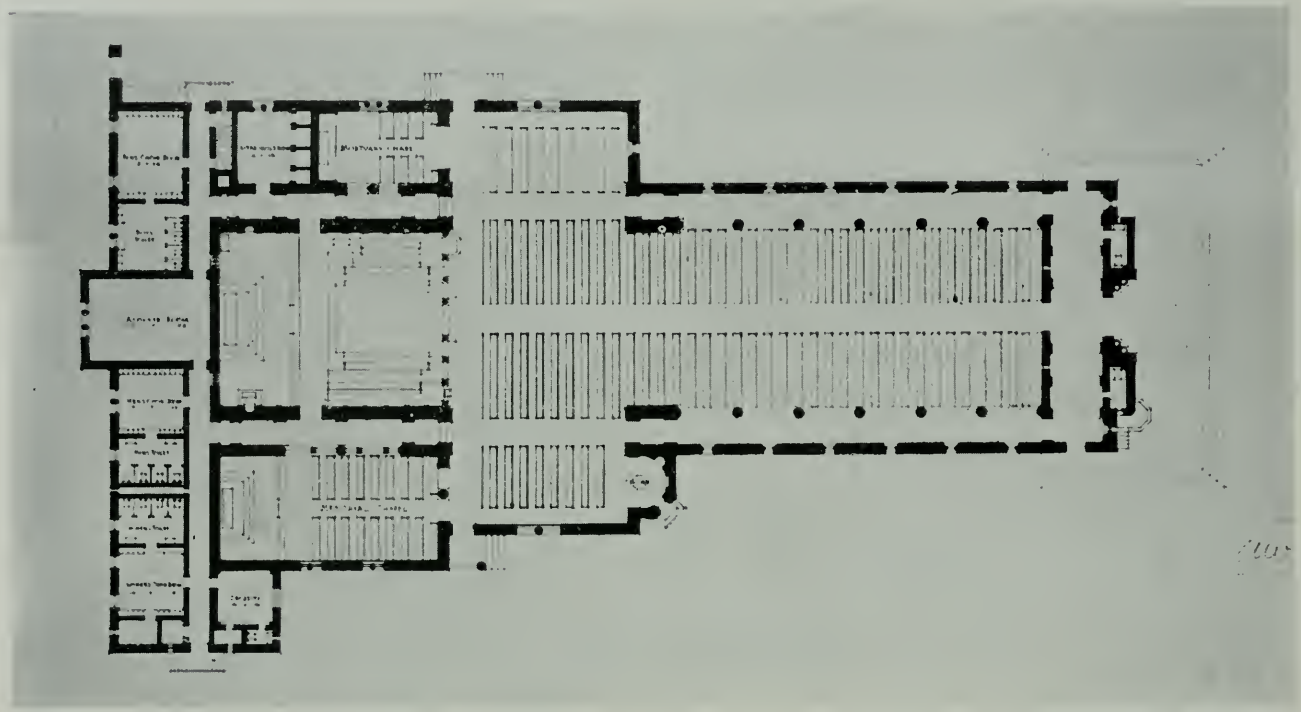
Competition for St. John's Church, Los Angeles, Cal.

WINNING DESIGN—FRONT ELEVATION AND CROSS SECTION
PIERPONT AND WALTER S. DAVIS, ARCHITECTS



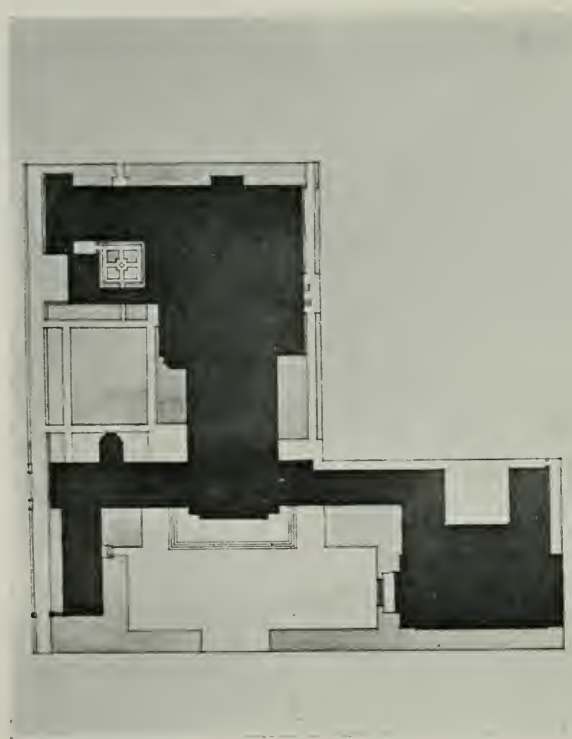
Competition for St. John's Church, Los Angeles, Cal.

WINNING DESIGN—SIDE ELEVATION AND LONGITUDINAL SECTION. PIERPONT AND WALTER S. DAVIS, ARCHITECTS

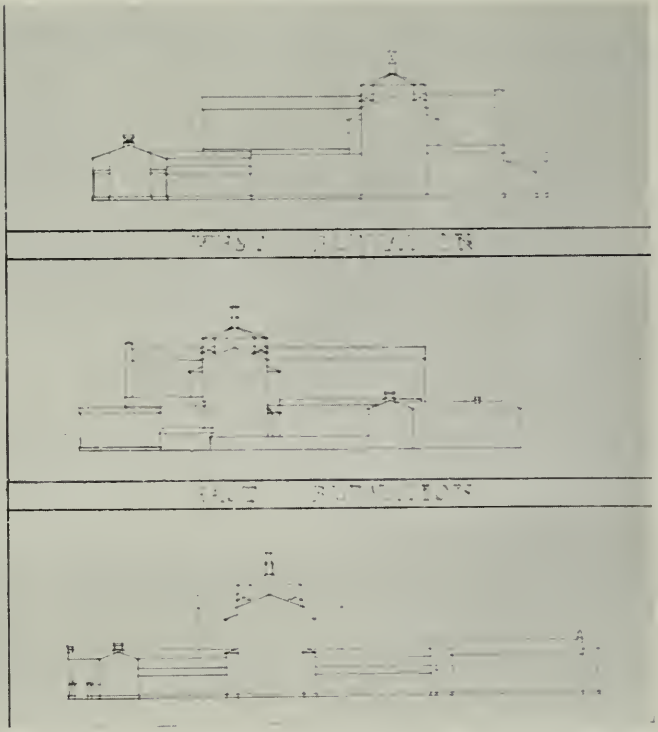


Competition for St. John's Church, Los Angeles, Cal.

WINNING DESIGN—PLAN OF CHURCH
PIERPONT AND WALTER S. DAVIS, ARCHITECTS

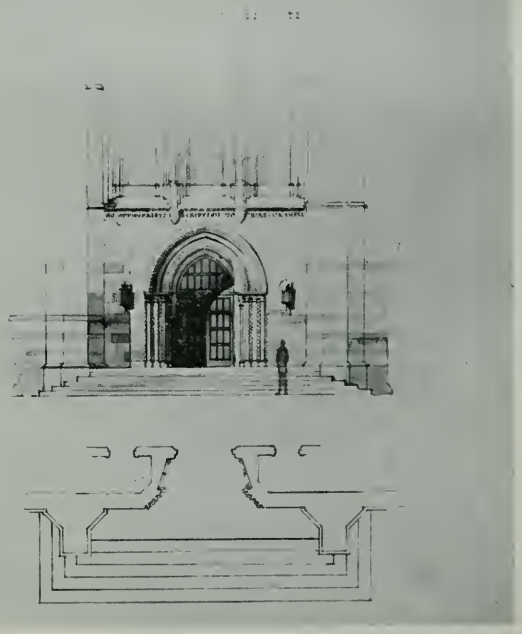


Competition for St. John's Church, Los Angeles, Cal.

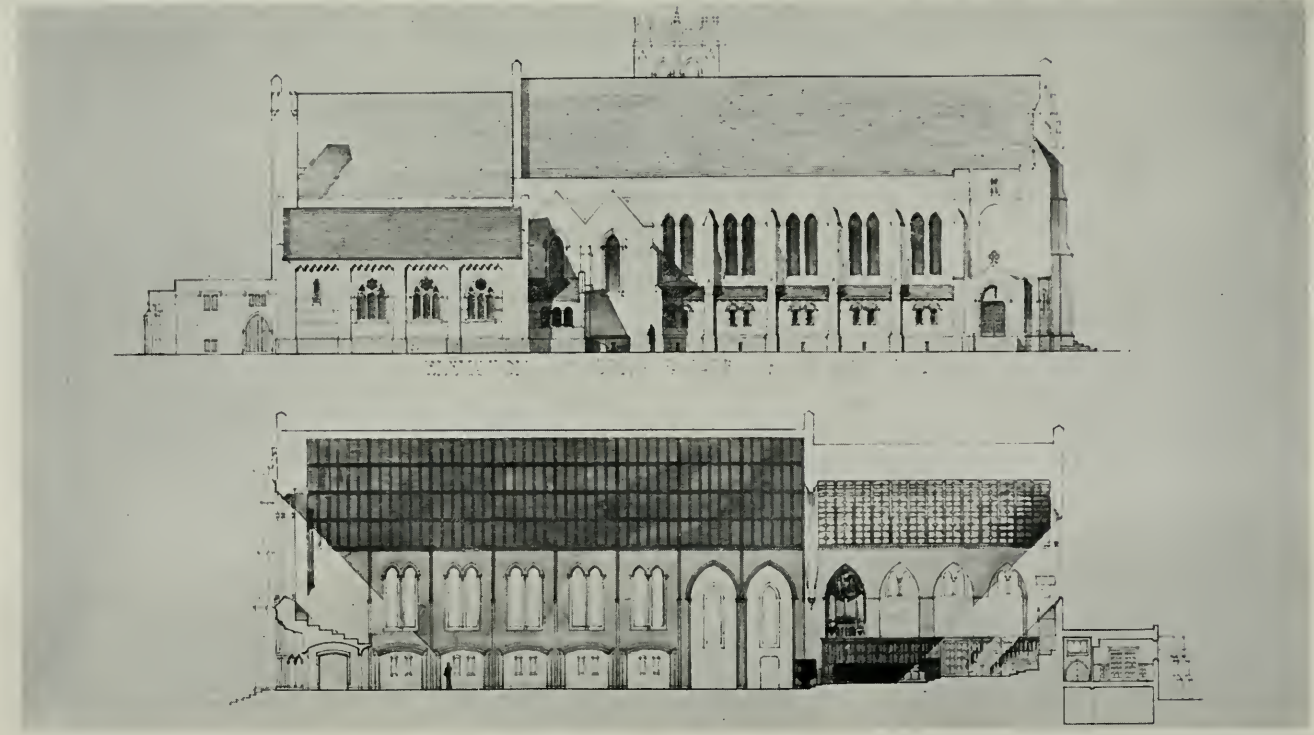


WINNING DESIGN—BLOCK PLAN AND ELEVATIONS
PIERPONT AND WALTER S. DAVIS, ARCHITECTS

Competition for St. John's Church, Los Angeles, Cal.

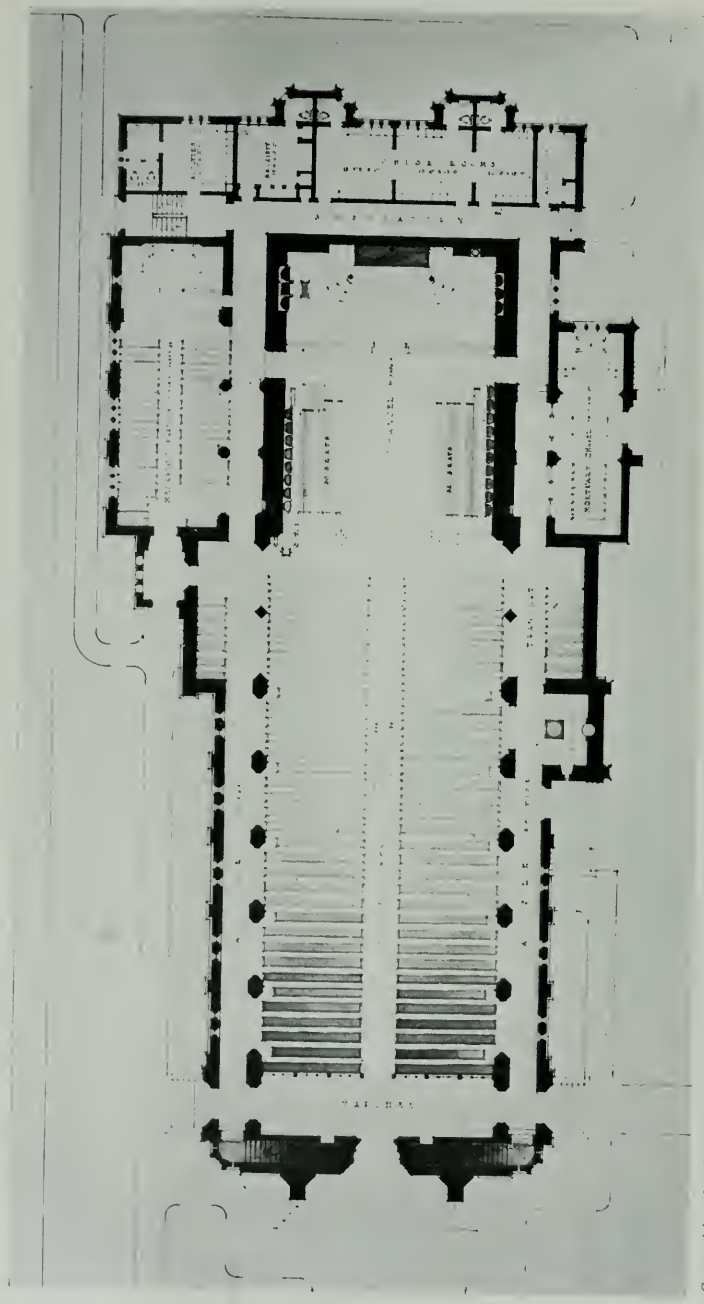


FRONT ELEVATION AND CROSS SECTION
ALLISON AND ALLISON, ARCHITECTS



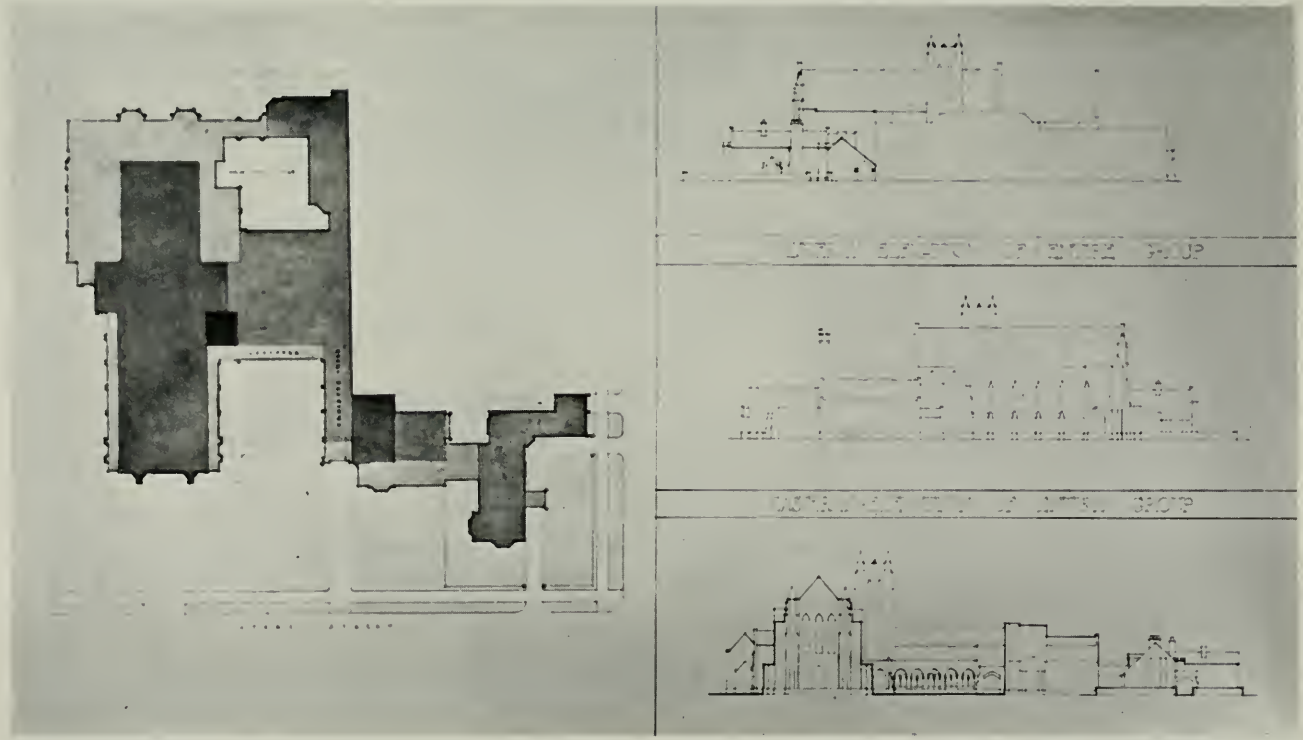
Competition for St. John's Church, Los Angeles, Cal.

SIDE ELEVATION AND LONGITUDINAL SECTION
ALLISON AND ALLISON, ARCHITECTS



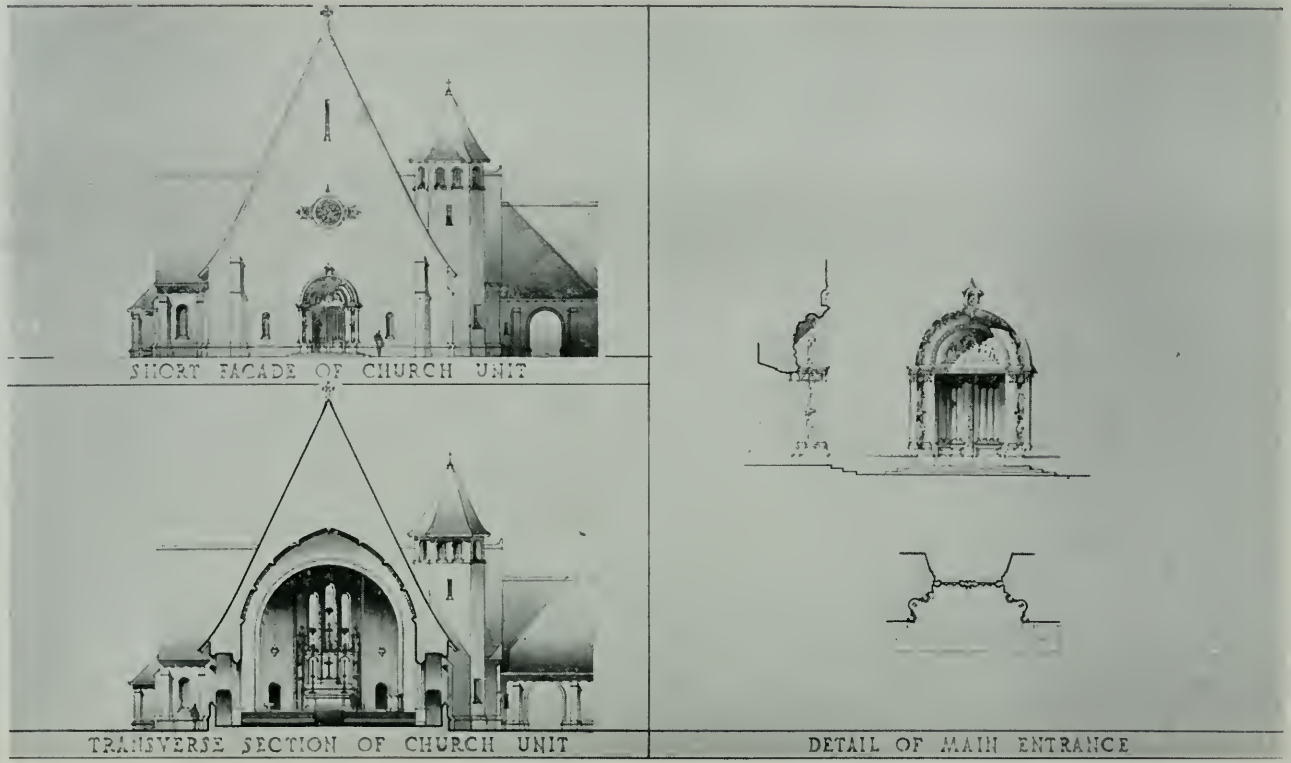
PLAN OF PROPOSED CHURCH
ALLISON AND ALLISON, ARCHITECTS

Competition for St. John's Church, Los Angeles, Cal.



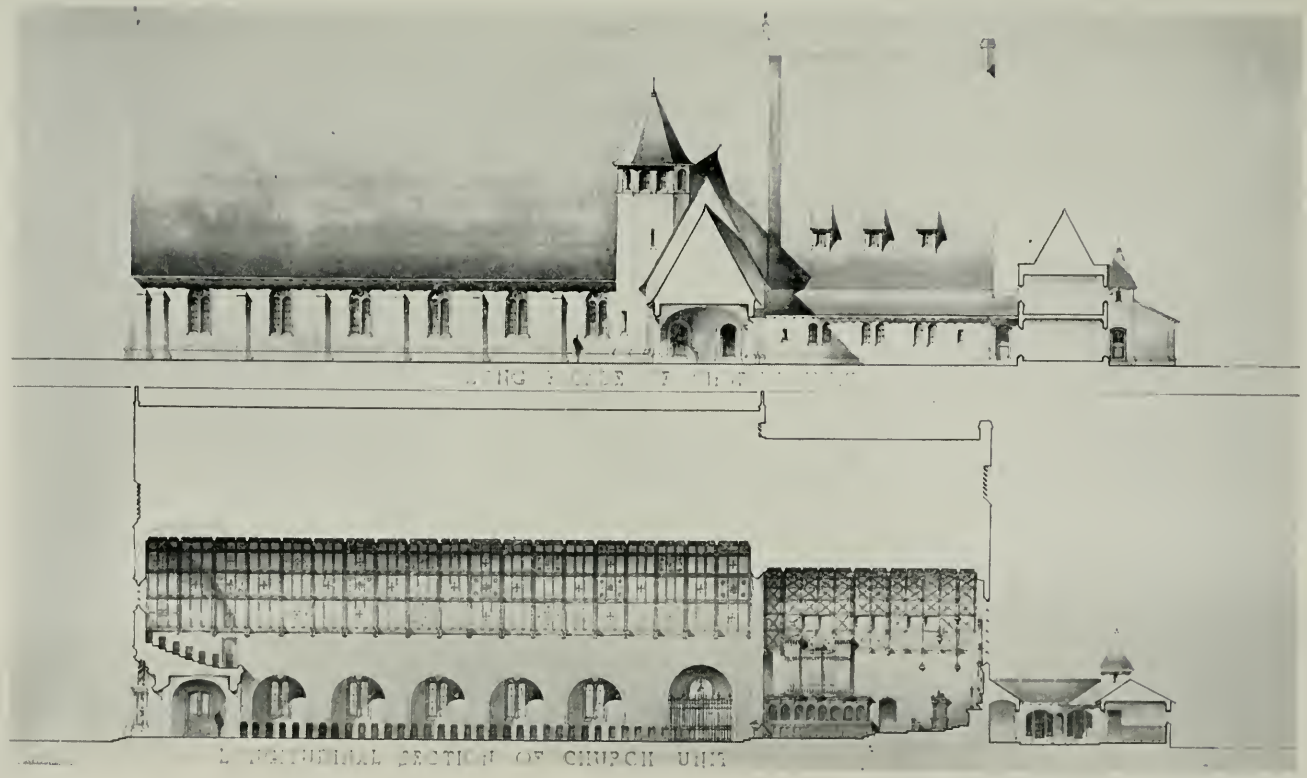
Competition for St. John's Church, Los Angeles, Cal.

BLOCK PLAN AND ELEVATIONS
ALLISON AND ALLISON, ARCHITECTS



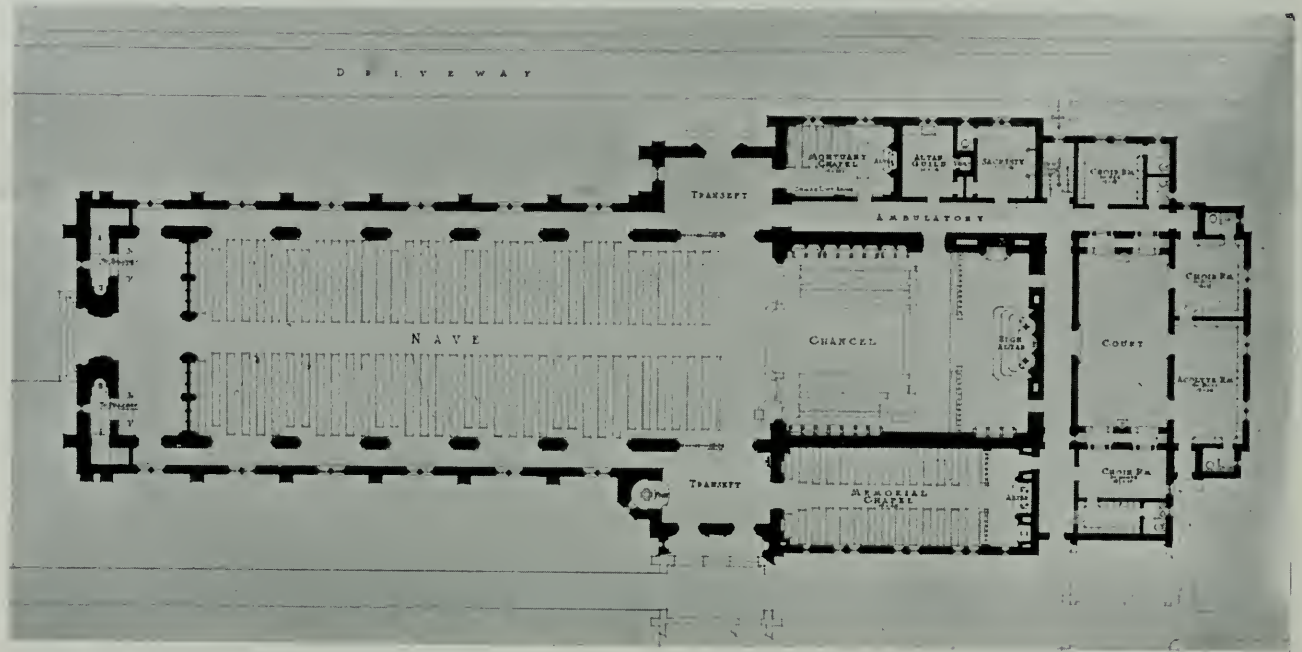
Competition for St. John's Church, Los Angeles, Cal.

FRONT ELEVATION AND CROSS SECTION
ROBERT D. FARQUHAR, ARCHITECT



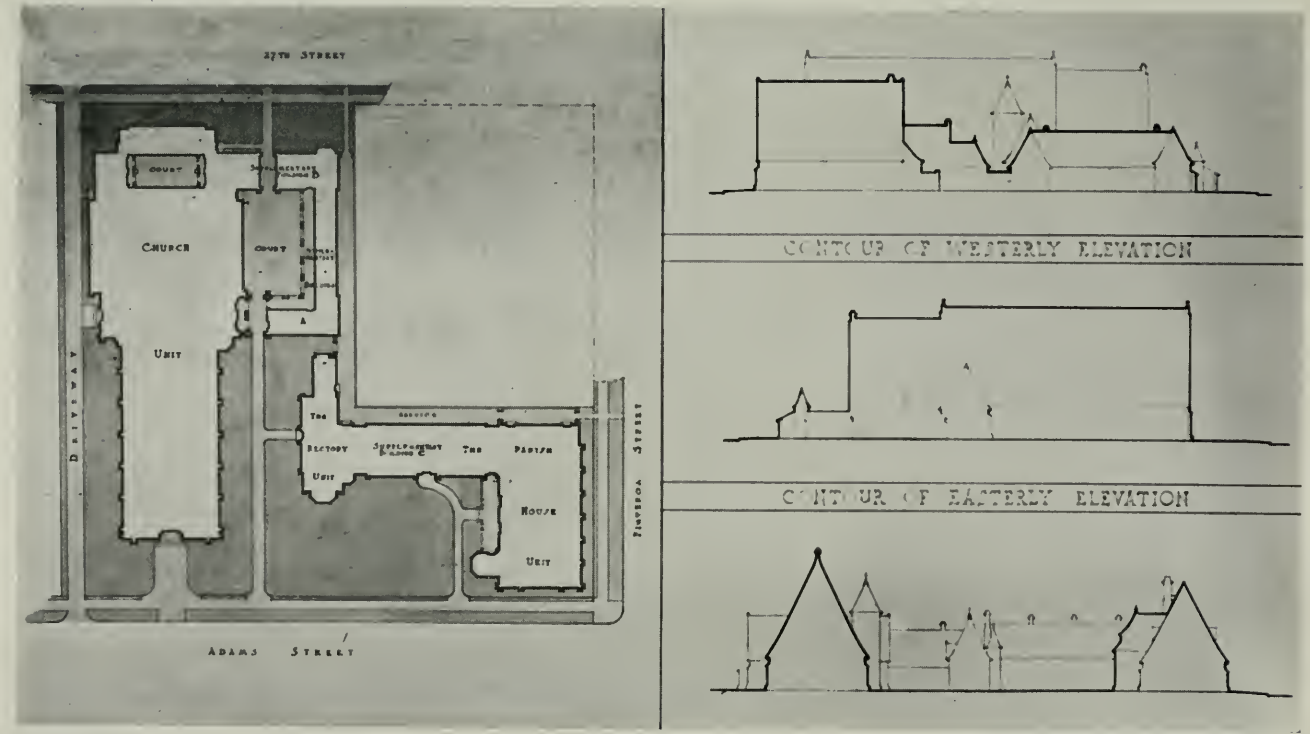
Competition for St. John's Church, Los Angeles, Cal.

SIDE ELEVATION AND LONGITUDINAL SECTION
ROBERT D. FARQUHAR, ARCHITECT



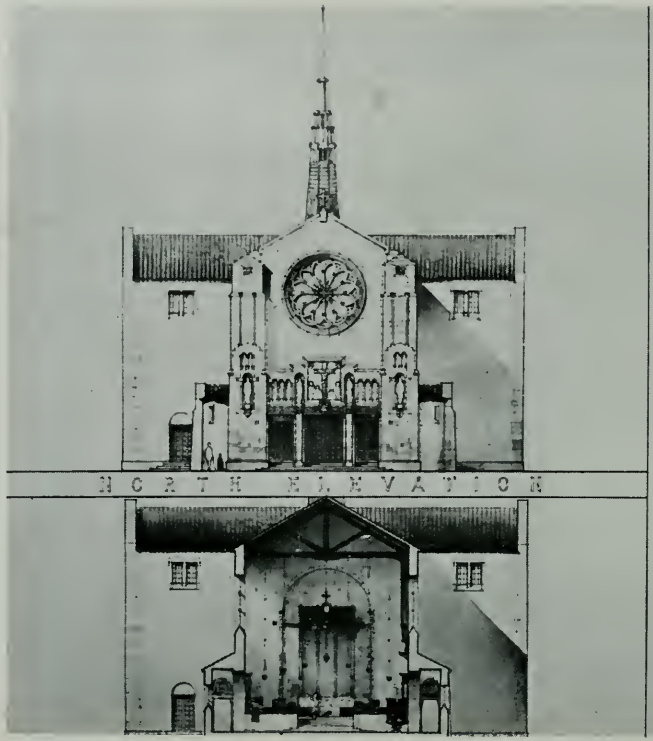
Competition for St. John's Church, Los Angeles, Cal.

PLAN OF PROPOSED CHURCH
ROBERT D. FARQUHAR, ARCHITECT

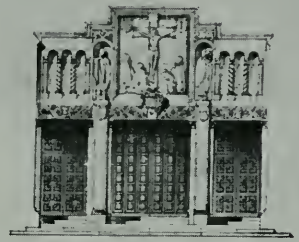


Competition for St. John's Church, Los Angeles, Cal.

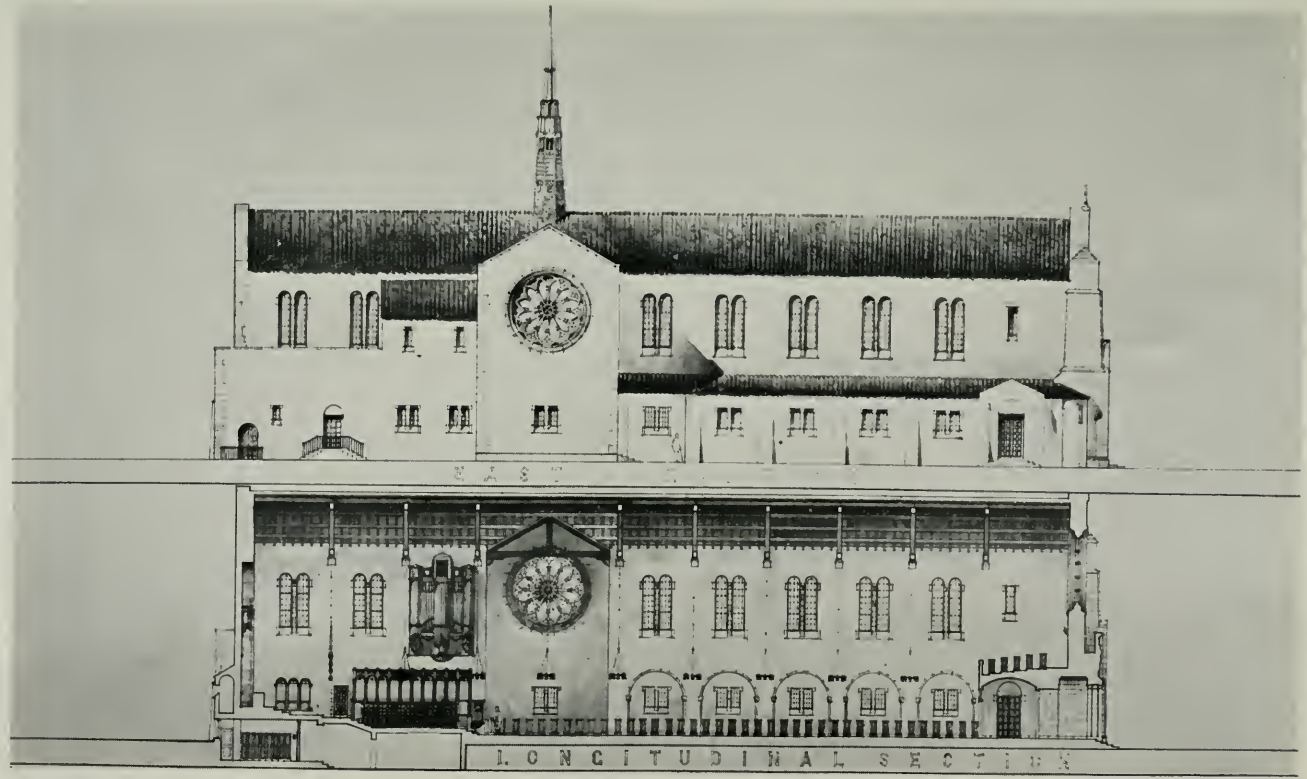
BLOCK PLAN AND ELEVATIONS
ROBERT D. FARQUHAR, ARCHITECT



Competition for St. John's Church, Los Angeles, Cal.

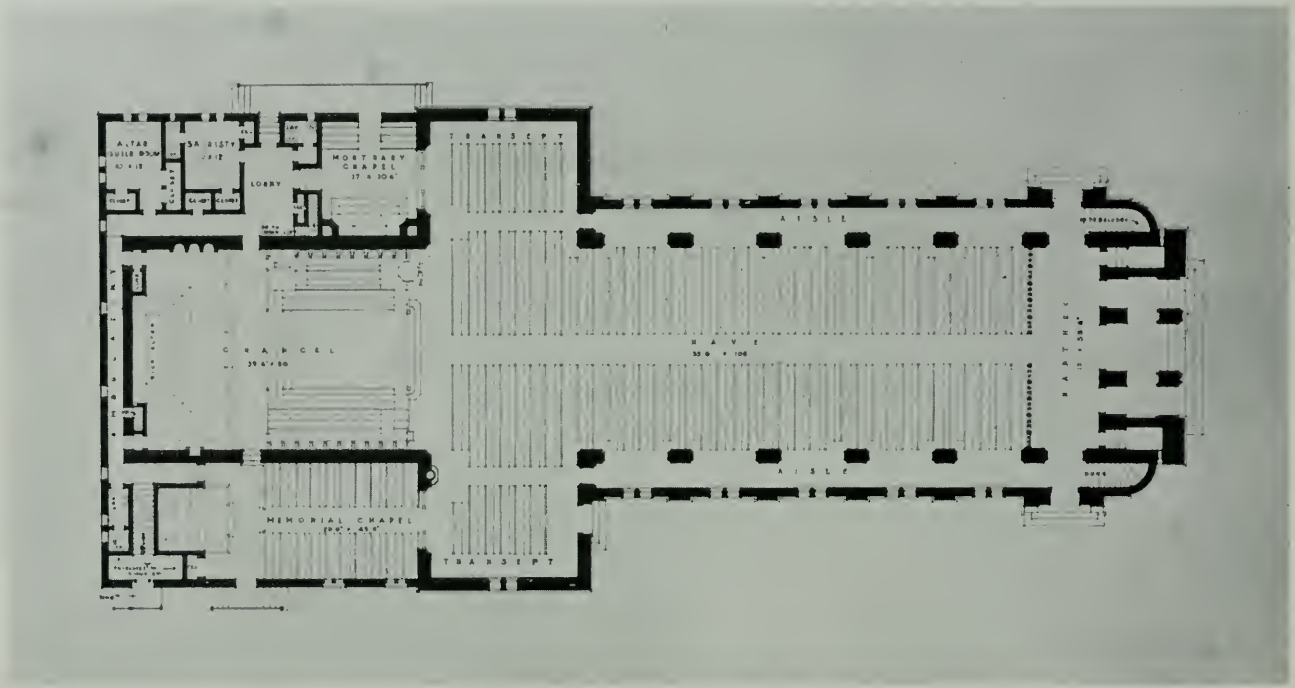


FRONT ELEVATION AND CROSS SECTION
REGINALD D. JOHNSON, ARCHITECT



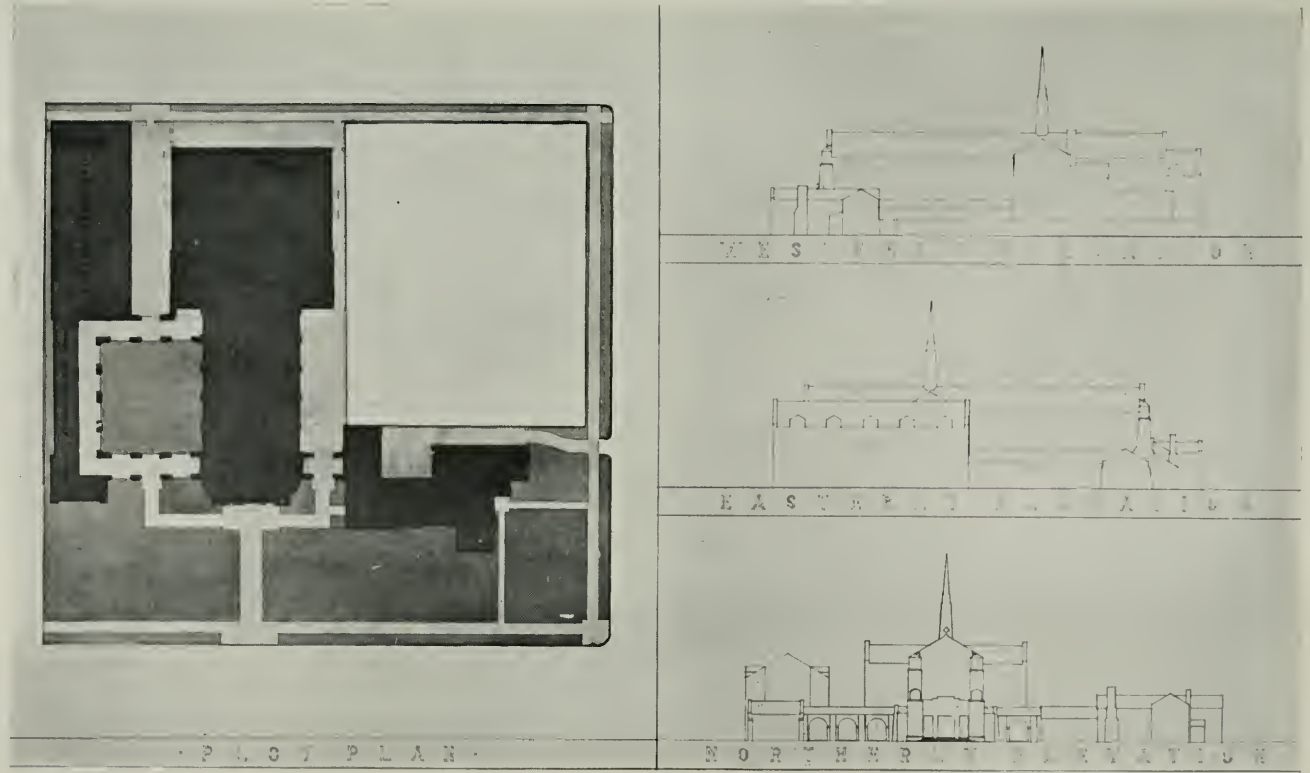
Competition for St. John's Church, Los Angeles, Cal.

SIDE ELEVATION AND LONGITUDINAL SECTION
REGINALD D. JOHNSON, ARCHITECT



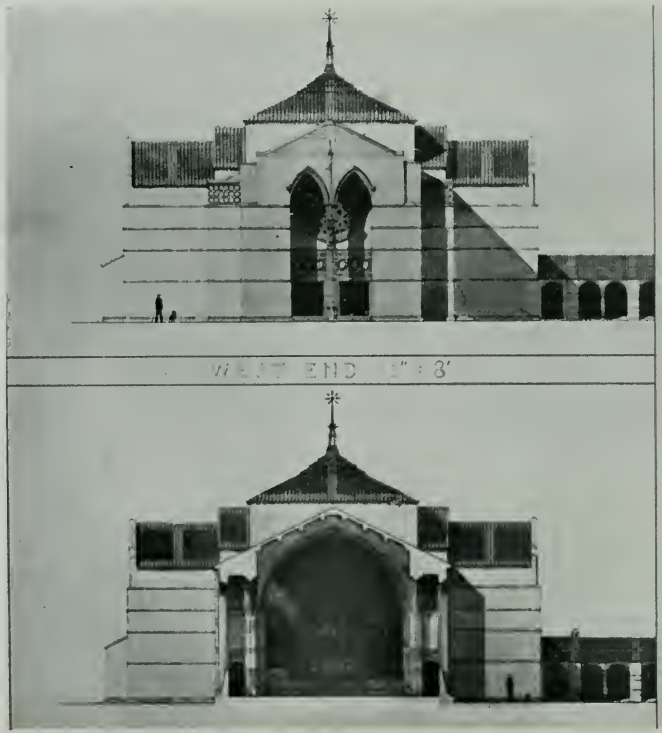
Competition for St. John's Church, Los Angeles, Cal.

PLAN OF PROPOSED CHURCH
REGINALD D. JOHNSON, ARCHITECT



Competition for St. John's Church, Los Angeles, Cal.

BLOCK PLAN AND ELEVATIONS
REGINALD D. JOHNSON, ARCHITECT

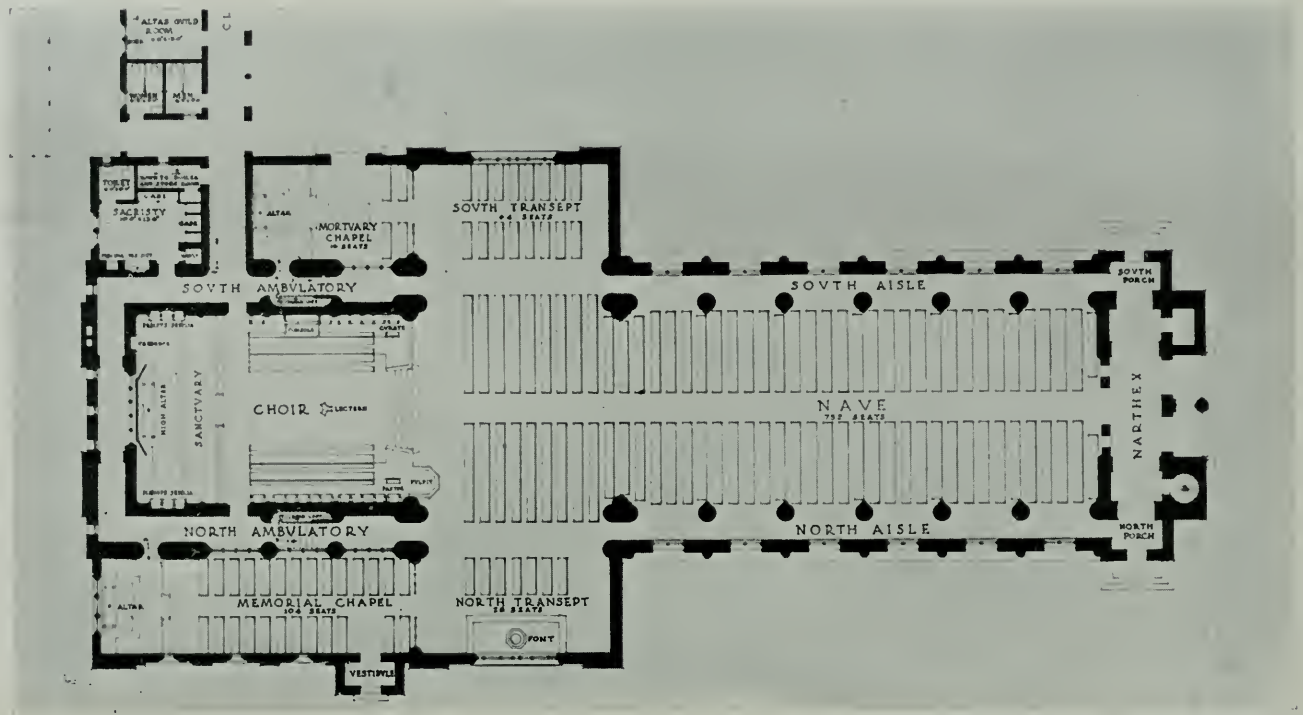


Competition for St. John's Church, Los Angeles, Cal.

FRONT ELEVATION AND CROSS SECTION
MONTGOMERY AND NIBECKER, ARCHITECTS

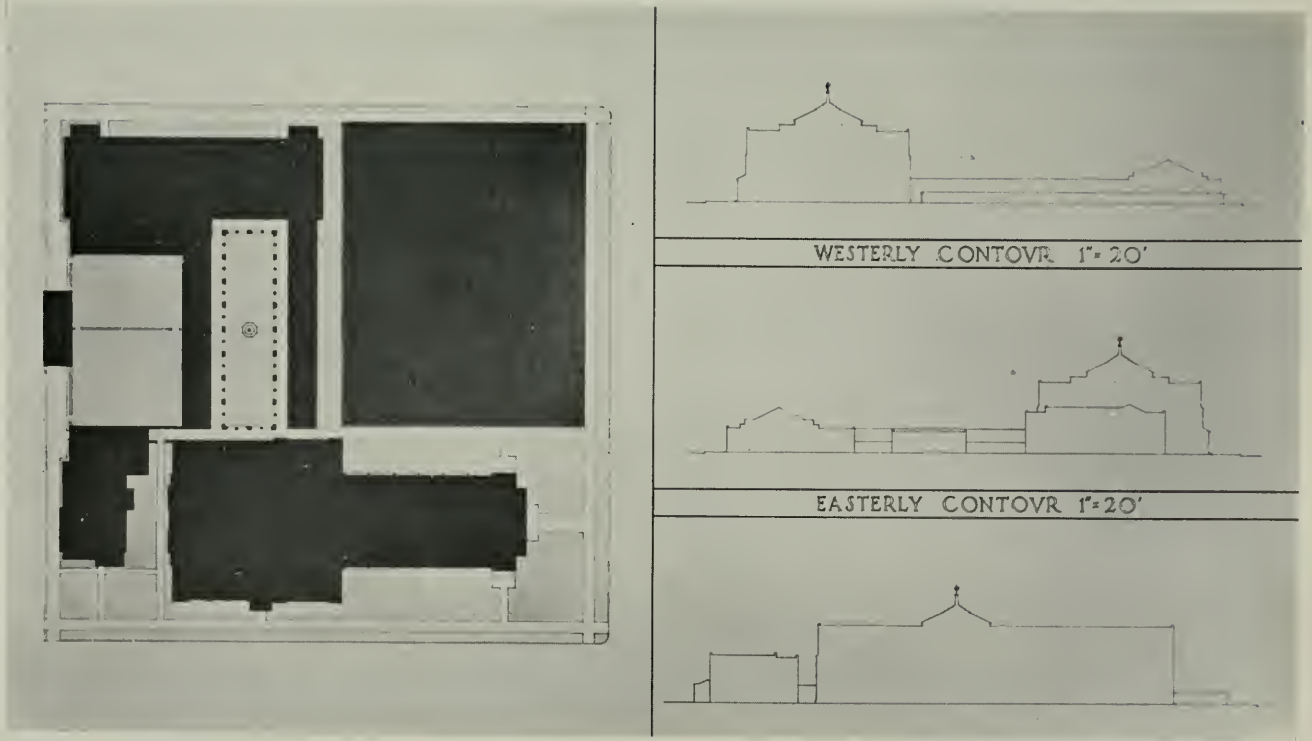
Competition for St. John's Church, Los Angeles, Cal.

SIDE ELEVATION AND LONGITUDINAL SECTION
MONTGOMERY AND NIBECKER, ARCHITECTS



Competition for St. John's Church, Los Angeles, Cal.

PLAN OF PROPOSED CHURCH
MONTGOMERY & NIBECKER, ARCHITECTS



Competition for St. John's Church, Los Angeles, Cal.

BLOCK PLAN AND ELEVATIONS
MONTGOMERY AND NIBECKER, ARCHITECTS

Increasing Efficiency of Chimneys and Fireplaces

THE fireplace is the heart of the home—and yet, how many smoky fireplaces there are driving their disgusted possessors to less picturesque but more efficient ways of keeping warm. The smoky fireplace and the unsatisfactory operation of other heating arrangements are often due to a poorly constructed chimney, the United States Department of Agriculture points out in a new Farmers' Bulletin, No. 1230, "Chimneys and Fireplaces, How to Build Them," by Mr. A. M. Daniels of the Bureau of Public Roads. The common faults in chimney construction are discussed in detail, and exact directions are given for building chimneys of suitable dimensions and materials.

Good draft in the chimney is necessary to efficient operation. Attention is especially drawn to the fact that a chimney must extend about two feet above the ridge of the house if it is to have a good draft. All chimneys should rest on masonry foundations in the ground. The shape and size of the flue are very important. Round flues are to be preferred, but rectangular ones are usual.

The problem of the smoky fireplace is also dwelt upon from the standpoint of fireplace construction. The need for a throat equal in area to the area of the flue is explained, and emphasis is laid on the importance of a smoke shelf about 8 inches above the throat of the fireplace.

An entirely new application of a simple heating principle in connection with fireplaces was patented by Mr. Joseph Parsons, of Lakeville, Conn., and the patent afterwards assigned by him to the United States government. Instead of supplying the fire with oxygen from the cold air flowing in through cracks around windows and doors, the inventor suggested making the house as air-tight as possible and supplying the necessary oxygen through a special opening in the chimney, placed in such a way that the incoming air would be warmed by passing over and around the fire. An extension of this idea is the provision of an extra warm-air flue which would carry fireplace heat to a register in the coldest part of the room.

Particulars of constructing an ordinary fireplace properly, and for installing a warm-air flue for improved fireplace heating, are described in the Bulletin, which may be obtained upon application to the Department of Agriculture, Washington, D. C.

* * *

Tribute to American Architecture

PROF. C. H. REILLY, of the School of Architecture, Liverpool University, has just paid a tribute to American architecture which he said is purer and more stable than that of England. "America does not seem to be swept as our country has been by fashions set by individual contemporary architects," he said. "American architecture has been, in the last thirty years, less self-sufficient and less insular than British.

"The American architect deliberately seeks his inspiration in the work of the Italian, French and Spanish renaissance. One has no fear that Fifth avenue will at any moment be spoiled by a glazed terra cotta building, with grotesque German detail, yet, who can say the same of Oxford street or the Strand, or any leading London thoroughfare?"

* * *

The Harmonious Home

Interior decoration cannot be undertaken in a haphazard manner nor can it be accomplished, when "fads and fancies" form the dominant note. Artists, decorators and designers of wide experience are co-operating to make the home one of "harmonious good taste."

Burnham, Master City Planner

By EDWARD F. O'DAY, Editor Burnham Plan for San Francisco

THE choice of Mr. Charles Moore to write the authoritative biography of Mr. Daniel H. Burnham is as happy in the outcome as it was in the inspiration, for the literature of the fine arts has been enriched by two monumental volumes conceived in sympathy, brought forth with the labor of love and destined to be for all time a living force in American Architecture and City Planning.

Mr. Burnham was the first chairman of the National Commission of Fine Arts; Mr. Moore now occupies that important position. Mr. Moore was private secretary to Senator McMillan of Michigan when that statesman of high ideals and keen vision fathered the bill creating the Washington Plan Commission and other enlightened legislation designed to develop a national art consciousness in the United States. His resultant association with Burnham was long and intimate. The country is deeply indebted to him for this work, wherein a great American is fittingly commemorated and interpreted.*

Burnham the Architect lives in these pages as in his buildings all over the country—a pathfinder, a genius, an artist who knew how to translate his dream into the practicalities of a business age. But it is Burnham the City Planner who here captures the imagination and compels the admiration of the layman.

The gods were good to the United States when they ordained that Mr. Burnham should be Chief of Construction of the World's Columbian Exposition at Chicago. For Mr. Burnham was inspired to give the country its first great lesson in the cooperation of artists for public service. As Charles Moore writes in his preface: "It was a glorious company that fought under his leadership—McKim, Saint-Gaudens, the Olmsteads, Frank Millet, Theodore Thomas are but typical names." The influence of that great lesson was a living force in San Francisco more than twenty years later, when another great group of artists cooperated to make an even greater world's fair, the Panama-Pacific International Exposition.

Mr. Burnham emerged from the Chicago project with ideals which led him by deliberate, sure steps to the highest expression of which he was capable as a patriotic American artist conscious of his duty to his country. His ideals led him to city planning. His ideals are expressed forever in the plans he formulated for Washington, Manila, Cleveland, San Francisco and Chicago. Mr. Burnham himself declared that the inception of great planning of public buildings and grounds in the United States was in the Chicago Fair. "The beauty of its arrangement and of its buildings," he said in 1910, "made a profound impression not merely upon the highly educated part of the community, but still more perhaps upon the masses, and this impression has been a lasting one. As a first result of the object lesson the government took up the torch and proceeded to make a comprehensive plan for the future development of the capital. Since then every considerable town in the country has gone into this study, and there are many hundreds of plan commissions at work at the present time throughout the United States." He might have added in the words of Æneas: *Quaeque ipse vidi et quorum pars magna fui.*

This city planning movement got under way about 1900. It was ten years old and growing vigorously when Professor Beresford Pitt captured its spirit in an admirable sentence spoken at the city planning conference

*Daniel H. Burnham, Architect, Planner of Cities, by Charles Moore. With illustrations. Two volumes. Boston and New York. Houghton, Mifflin Company, MCMXXI.

in London, in which Mr. Burnham was a distinguished participant. Professor Pitt said:

"The glory of a city is its grandeur: the gracious width of its streets, the adjusted proportions of its squares, and accompanying these, of necessity, healthy spaciousness and ordered amenities."

Mr. Burnham too could sound that high note, but he was skilled also in presenting the practical advantage of a city plan. "Beauty," he told the citizens of Chicago, "has always paid better than any other commodity and always will." He went to antiquity for a conclusive demonstration:

"Athens was a commercial city which, four hundred years before Christ, controlled the commerce of the world, but the time came when she saw that her supremacy was about to slip away. Pericles, her ruler, perceived this and determined that though men might seek wealth in other lands, they should come to Athens to spend it; and he gathered up all the funds of the colonies, and with them superbly adorned his city. . . . He determined that the city should prosper in the future even more than it had in the past, and by making Athens fair to gaze upon and delightful to live in, he accomplished the purpose he had in view. In short, a commercial city is the one of all others that should be interested in putting on a becoming dress and assuming a charming appearance. Pericles was a political genius who knew how to perpetuate the prosperity of a city."

Neither Athens nor Rome was made beautiful in a day. Mr. Burnham was patient of obstacles; he knew that education alone could awaken the kind of civic consciousness he sought. He had a strong man's optimism. Therefore, he said beautifully:

"Make no little plans; they have no magic to stir men's blood and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency. Remember that our sons and grandsons are going to do things that would stagger us. Let your watchword be order and your beacon beauty."

This, Mr. Moore justly writes, "has become the motto of city planners." It is the answer of the spirit to those who feel discouraged when great city plans suffer temporary setback.

Mr. Burnham studied the character of a city and strove not merely to express but to elevate it. He saw widely and interpreted nobly. It is significant that he studied Chicago from the roof of the Railway Exchange Building, and San Francisco from the top of Twin Peaks. But the ivory tower was not for him. His outlook was from a workshop upon a world of realities. "It is not to be expected," he said, "that a plan devised while as yet few civic problems have received final solution will be perfect in all its details." These words were spoken of Chicago, but they apply with at least equal force to San Francisco.

Many of San Francisco's civic problems were far from final solution when Mr. Burnham conceived his plan for the improvement and adornment of the city. That plan, as wrought out in detail by Mr. Edward H. Bennett, had just come from the printing press when the disaster of 1906 overwhelmed San Francisco. The Burnham Plan suffered a temporary setback. Yet the Burnham influence could not be entirely disregarded. In the words of Mr. James D. Phelan, president of the Association for the Improvement and Adornment of San Francisco (carefully considered words in a letter to Mr. Moore):

"As a result of his educational influence and the Plan, we now have a beautiful civic centre, inferior in site to the one he laid out, but only two blocks removed from it. I believe that the existence of this fine civic centre, as it is today, flanked by city hall, auditorium, and library, is due to him, as is also the parkway connecting Golden Gate Park and the Presidio. As the time goes on, his various suggestions, as embodied in the Plan, will, I believe, be adopted."

And Mr. Willis Polk, who was associated with Mr. Burnham in the making of the San Francisco Plan and of whom Mr. Moore writes that he "has never ceased to press upon the attention of the people of San Francisco the permanent character of the Burnham Plan, and the value of its component parts," supplements Senator Phelan's statement as follows:

"Perhaps few of us realize that this plan was essentially a plan for the future. Nearly all of us have been too limited in our imaginations to visualize its potentialities. San Francisco seems to have done nothing, yet in effect it has done much."

Considering how much Chicago has accomplished along the lines of its Burnham Plan, the results thus far in San Francisco may seem disheartening, but to take a pessimistic view of the outlook is to disregard the most important lessons Burnham endeavored to teach. The Burnham Plan for San Francisco is not a little plan. It has magic to stir men's blood. It is noble, it is logical; it will not die. Its execution will eventually add another glory to the name of the master city planner "whose influence," as Mr. Moore says in the concluding sentence of this biography, "was so fine and so strong that to those who knew him his presence continues and will continue to be felt."

* * * *

I Am the Architect

PATTERNING after the Omnipotent Architect, I create, striving always for the beautiful through greatest utility.

I serve the world as the thinker whose thoughts precede the need, and bring into likeness the means of fulfilling that need.

My mind has conceived the housing of man and beast—of the wheels of industry—of the machines of production.

My visions transferred to lasting form guide the men of the earth in selecting shelter for life, love and work, the three greatest blessings.

The arts and the sciences are my masters and my tools. I appeal to them and I use them to produce greater comfort and greater happiness for mankind.

From the turrets of the east to the pillars of the west, I draw material ideas to form the basis of my conception, striving always to be rewarded by the execution of the fittest.

I hope, pray and labor to do better and greater things in the daily doing of my duty, that the structures—children of my ingenuity—may live and bespeak my sincerity.

My creed is growth and development—evolution of the ultimate in satisfaction.

I build up—

I am the Architect.

HOWARD LAW,

By permission of Chas. B. Johnson & Son.

Joint Convention of Idaho Architects and Engineers

THE first joint convention of the Idaho Society of Architects, the Idaho Chapter, A. A. of E., and the Idaho Irrigation Congress was held at Rupert, Idaho, January 16 to 21, with an attendance of nearly 100 members of the three organizations. A splendid program was arranged, with discussions on such interesting subjects as "The Relation and Need of Co-operation Between the Architect and Engineer," by Mr. W. L. Skidmore of Pocatello; "Architectural Practice, Office Management, Specifications and Quantity Survey," by Mr. Burton E. Morse of Twin Falls; "Relation of the A. I. A. to State Societies," by Mr. Leslie S. Hodgson, president of Utah Chapter, A. I. A.; "Practice and Fees," by Mr. Fred F. Wilson, secretary of the Montana Society of Architects, Bozeman, Mont.; and "City Planning, Objects and Why," by Mr. I. L. Wright, secretary of the Idaho Society of Architects, Idaho Falls.

Mr. H. Newton Thornton of Idaho Falls, president of the Idaho Society of Architects, delivered the opening remarks, reviewing briefly some of the more important achievements of the society since its inception in 1915. The society was primarily responsible for securing adoption of the Architects' Registration Law, and is now working indefatigably to obtain legislative indorsement of a State Building Code for Idaho. The old board of officers of the society was re-elected as follows: President, H. Newton Thornton, A. I. A., Idaho Falls; first vice-president, F. C. Hummell, Boise; second vice-president, Frank H. Paradice, Jr. A.I.A., Pocatello; secretary and treasurer, I. L. Wright, Idaho Falls; directors, F. L. McGrew of Idaho Falls, C. F. Hummell of Boise, Marcus Grundfor of Pocatello, Burton E. Morse, A.I.A., of Twin Falls.

The following extracts are taken from Mr. Thornton's address on "A State Building Code for Idaho.*

It is a serious reflection on the architects of the State of Idaho, and the whole country for that matter, that so many of the building codes of the smaller cities appear to be heirlooms from the past ages when reinforced concrete construction was undreamed of, and many of our modern methods of construction and sanitation were not yet developed.

Various restrictions appear to be relics from the past and merely serve to remind us of an unenlightened age or of our remarkable evolution in matters of building. All this should be remedied, but on account of the cost of printing and the time involved in bringing the laws up to modern standards, we still work for the most part by an antiquated city building code, that should long ago have been consigned to the scrap heap. This has served in a large measure to breed contempt in the minds of builders and architects for building codes in general.

In addition to this, there has been no adequate inspection of the buildings erected. In most cases there is no building inspector at all, and in many cases where there is one he is not qualified for the position or the remuneration for his services is purely nominal and he cannot afford the time to carefully examine all buildings to see that they are in accordance with approved plans. This again has resulted in contempt for the city building code.

In the early stages of the growth of our western country the pioneers were so glad to see any kind of a building go up that they cared little for restrictions. The word restriction would never have appealed to them, for they were anxious to encourage the erection of any kind of a structure that seemed to give prominence to their communities and provide work for its citizens. A code placing restrictions on building was not looked upon with favor, and so gradually a free for all, go as you please policy was adopted that soon began to make trouble as the settlement grew into a town.

The evolution of our towns shows many instances of this condition and we gradually get accustomed to the unsightly eyesores which are a menace to our safety

*Editor's Note: Mr. Thornton's views are timely because of the recent collapse of the Knickerbocker Theatre in Washington, declared to have been due to faulty design and incompetent inspection. Steel construction intended to support the roof was weak in certain points and below the requirements of the plans submitted, according to Mr. Robert Henry Davis, engineer in the District of Columbia, who was employed to investigate the cause of the accident.

and health and we even sometimes begin to regard them as familiar landmarks. However, the smaller towns of this western country have improved so much over the pioneering conditions of the past, that if it were not for the prohibitive cost, many of the older structures would be condemned and razed to the ground to make way for more efficient, more sanitary and more congenial buildings.

The buildings of a community have their advertising value and represent the thought and progressiveness of its architects, builders and citizens in that community. A well written building code pays large dividends to the city or state that adopts it; it is of inestimable value to the fire departments, it helps progress and respect for law and order, and is often the direct means of saving many lives. It is of course necessary in order to get the full benefit from any building code that a sufficient inspection is made of the buildings erected to insure that they conform to the approved plans.

The Idaho Society of Architects has long realized its responsibility in the matter of better building codes and has made an effort towards the establishment of a State Building Code, but has not yet been able to get any bill before the Legislature. At a recent annual meeting a standard building code was approved, but unfortunately the time was too limited to successfully carry the project to a conclusion, even though it received hearty support from leading state authorities.

To my mind we would have better chances of success if we tried the adoption of a simplified code, even if it did not contain all the provisions we desire, as a long complicated technical document appears to raise so many legal aspects that it involves long delays in consideration. Since our effort to establish a standard code many other states have succeeded in providing a building code carrying with same administrative officers for its enforcement or providing that buildings be erected after plans prepared by registered architects, where public safety and health are concerned. The latter provision being to safeguard the building public against those who in their ignorance seek to erect buildings for public use, without the services of persons qualified by law.

There is little wonder that so much poor and unsafe construction work is built when we consider the present architects' law, which permits any person or persons to prepare plans and erect buildings therefrom, provided they do not use the title of architect or engineer, and in all cases of disaster that happens to buildings the professions usually suffer condemnation in the public mind.

Of course, the mad scramble for dollars in investment is one of the chief reasons of failure and the slow progress made towards proper regulation, rather than a real or imagined lack of ability to pay for a code and the subsequent expense of enforcement.

The present conditions, especially in the western territory, are very largely responsible for the several menaces we have with us today, even inside the architectural profession, such as the type of architect who from a lack of desire to use modern methods and revised formulae and with a total disregard for anything new in building materials increases to an unnecessary extent the cost of construction. This results in contractors and other taking advantage of their opportunity and proving their ability to build for less money by eliminating architectural control and supervision.

A little knowledge in the building industry is more dangerous than in any other line of business when one is permitted to exercise it without regulation. Look at the class of work, in the most cases, of builders who obtained their knowledge of building through the mill of limited experience only, with no technical training or regard for accepted formulae, and in many cases without any educational base whatsoever. This class of builder, who blindly treads where angels would fear, brings about much of the bungles and abortions in the construction industry.

It is not surprising under such circumstances that the architectural profession is slow to gain the confidence of the building public, especially where these conditions just mentioned exist. This indeed makes it hard to sell our services or educate the public that their interests are best conserved, their safety and health best guarded by regulation and the employment of expert service.

Then again the public are always made acquainted through the press or otherwise, of failures, insanitary conditions, fire hazards and collapse of construction work, and the causes are usually laid at the doors of the profession in the public mind. We know in mosts cases, it not all, that these conditions can be traced to the unqualified and inexperienced builder, the greedy investor, or the lack of regulation and municipal supervision.

I do not want to be an alarmist, as the condition is not so discouraging as all that. However, we ought to at least recognize it, and brush the cobwebs from our own methods, and take advantage of new ideas, new materials and formulae as other professions do. Perhaps post graduate courses in our educational institutions and

societies, similar to the medical profession, would tend to keep us abreast of the times and be the means of much progress.

True public service is the responsibility of the profession and when this service is rendered it is one of the chief means of convincing the man on the street the value of architectural standards.

The financial loss to the profession through lack of regulation is another phase. I have seen as many as you have, in the survey of existing buildings executed without architectural control, inharmonious distribution of money to the extent that an architect's fee for the entire project has been absorbed in some single piece of construction, such as foundation walls, structural steel and absurd ornamentation and millinery effects.

Who has not had the feeling of irritation many times on reading the construction requirements of many of our city building codes. Take, for example, floor loads which vary from 40 lbs. per sq. ft. to 100 lbs. per sq. ft. for office buildings. Kidder emphasized this matter, and not many years ago made an investigation of actual loads in this class of buildings, and concluded that nearly all codes not only differed materially but were unnecessarily severe. The majority of architects if not hampered with code requirements consider 50 lbs. per sq. ft. ample.

Look at floor loads for dwellings in our present codes varying from 25 to 60 lbs. per sq. ft., and the actual conditions observed in thousands of occupied rooms seem to warrant no more than 30 lbs. per sq. ft. for upper floors and say 40 lbs. per sq. ft. for ground floors.

The live load for an apartment house in Milwaukee is 30 lbs. per sq. ft., while in Buffalo the requirements are 70 lbs. per sq. ft., more than twice. Surely it is an easy matter to arrive at safe live-load requirements for various buildings and standardize them to the end that such inconsistencies as this are eliminated.

An examination of floor load requirements in our present codes for all classes of buildings shows similar wide variations from loads manifestly too light to loads much too heavy and absurdly heavy in most cases.

In some cities 8" brick walls are permitted in certain classes of buildings, while in other cities only 12" is allowed. One of our leading magazines records some facts that are interesting in this regard. A building was recently erected in one of our cities where the walls had to be 12" thick, and the same plans were used in another city where the walls could be thinner. The steel work for the second building was redesigned and a saving in steel amounted to more than 260 tons. Floor loads and wind requirements were the same in both places.

What about speculative building? The recent collapse of a theater building in Brooklyn with its lamentable loss of life and serious injury of many workmen engaged in its construction was traced to speculative building interests.

This is another menace to the building industry, and always has been. Every effort is made by those engaged in this kind of business to avoid recognition of existing building codes, due partly to their severity and, of course, their desire to yield unreasonable profits on an investment.

Speculative building is one of the prime factors in our disasters, and should be governed by every precaution, regulation and municipal inspection. Think what might have happened if the Brooklyn theater had been completed and had fallen on an audience of hundreds of people. There should be no excuse or economy that would permit the use of poor and doubtful materials, and the recognition of our present codes, no matter how severe, especially for buildings designed for public assembly.

Then too there is the recent collapse of a grain elevator of no small proportions in one of our local cities, and the collapse of an amusement hall that nearly bordered a calamity, due to faulty roof construction, and many others could be cited. There is an unusual evidence of altogether too much latitude in this section, in the design and construction of floors and roofs, with little or no margin of safety for poor materials, unscrupulous contractors and other unusual conditions.

We are entirely to blame when we continue to permit such condition to exist, in face of our knowledge of these things, without making criminal complaint against those who continue to violate common accepted standards. We ought to rid our garments of such blunders, and in case any of us should be guilty of negligence in our own work and methods we should suffer the same consequences.

So much for the structural part of our service. A few words might now be indulged in with regard to plumbing and sanitation of buildings, which of a necessity is involved in a building code ,and by no means the least important.

The sanitary requirements of buildings have received more attention by our authorities than the structural requirements, with little or no enforcement of either, and the codes vary materially in different districts, retarding standardization in this class of work. The lack of uniformity in practice and the absence of standardization

and adequate inspection has been the means of encouraging unscrupulous plumbing contractors to violate every sanitary measure that has been established.

Cleanliness is the basic principle of sanitation and plumbing work provides the means of cleansing the person and apparel and the removal of body and domestic wastes from the immediate neighborhood of buildings. But the lack of knowledge and keen competition have developed a class of materials, construction and workmanship that is unfavorable to the health in many of our communities.

Insanitary conditions are sure to result if each person or plumbing contractor is permitted to install plumbing work according to his own ideas.

Poor plumbing work contributes very largely to the detriment of the architectural and engineering professions. Low first cost in this part of a building, as in others, is a mistaken economy. A second class plumbing, heating or drainage system will provide a second class system in service. A year or so in service will usually reveal the inefficiency of the fixture, device or construction. Discomfort, inconvenience, cost of repairs, foul odors, insanitary and unhealthy conditions are the resulting penalties which the unfortunate occupant or owner must pay.

Good plumbing is as much a science as any other branch of our professional service, and it should be installed in accordance with scientific principles and natural laws. We ought as a profession to pay more attention to this part of a building than we have in the past and the fundamentals of same should be embodied in our building codes. Municipal inspection should be by technically trained men and not medical doctors or others, as is the custom now in this section of the country, where there is any inspection at all.

I cannot conclude without a word about fire prevention and fire-safe buildings. An able president of one of the largest fire insurance companies has said: "As an individual, I would be very glad to see buildings made more fire-safe ,and especially theaters and buildings for public assembly, but as an underwriter I charge for the hazard as I find it, and need not care particularly whether the rate is one per cent or five per cent."

However, in the belief that fire-safe buildings and good construction should be universally recognized as of utmost importance, the National Board of Fire Underwriters, a commercial organization if you please, prepared and recommends a building code, which is sufficiently amplified for varying local conditions and we ought to make more use of it until we can establish something better ourselves.

* * *

In Favor of the Quantity Survey

SOMEWHERE about eight years ago, Mr. G. Alexander Wright, a member of the Institute in the San Francisco Chapter, besought the interest of the Journal in the subject of Quantity Surveying. He was a pioneer in an unreceptive land. And now that he is no more and, like many another, did not live to see his long devotion bear any great fruit, let it not be forgotten that he was a pioneer and that because of the interview in question the subject of Quantity Surveying was never lost to sight again, so far as the Institute was concerned. We are proud of our share in the document which has been sponsored by the Institute, the Engineering Council and the Associated General Contractors of America. It recommends the Quantity Survey to every owner, and very properly reminds him that he should not "pay a contractor an overhead charge which includes any other costs than belong to his own project," and likewise that an owner should pay for the preparation of an itemized list of quantities whether he proceeds with the contemplated project or not. Assuredly he should, and assuredly some owner does pay for them several times over, under the present system. The only man who gets anything free is the man who never builds, because all the expenses of nursing him through the preliminary approaches are saddled upon someone else. The overhead borne by the building industry, because of the supposed free service rendered, is no small item. Any man proposing to spend a considerable sum of money in building should insist on a Quantity Survey, as one of the most certain means of economy that he can employ.—Editorial in Journal of the American Institute of Architects.

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BUILD NOW!

Conditions are right, and now is the time to built.

It is an undisputed fact that there is a great shortage of proper housing facilities in San Francisco and the Bay Region, due principally to the thought that, as time goes on, there will be a decrease in building costs.

There has been an earnest and sincere effort made by some of our public spirited men to reduce the prices of building materials, which, in a measure, has been successful; but during the hearings it developed that the manufacturers themselves believed that the basic prices of raw material, rail rates, fuel oil and power were also due for a drop. They were, consequently, in many cases, running only to 50 per cent capacity, in order not to have on hand big stocks manufactured at present prices.

Architects are now busy on many new projects, speculative builders are enlarging their activities, and the investor is beginning to realize that there are increasing opportunities in the realty market.

The results are even now apparent. There is an increasing demand for materials of all kinds, and as the manufacturers have not been working to full capacity and have not accumulated any stocks, prices are bound to advance.

When the full significance of these facts is realized by the public, San Francisco will probably see a repetition of the 1918 and 1919 building booms.

We are now enjoying industrial peace. While the Impartial Wage Board, which has just handed down its decision, did not make any radical reductions, yet it equalized the wages of many of our mechanics and eliminated some of the so-called "skilled" crafts, whose work is now being done by common labor at about one-half the former cost.

An estimated saving in labor costs of about 20 per cent can be traced indirectly to an increased efficiency.

CHAS. W. GOMPERTZ.

MEMORIAL TREE PLANTING

It is gratifying to learn that the planting of memorial trees along the State highways in California is being undertaken in some localities with enthusiasm and a sentimental interest is being aroused and fostered by various clubs and patriotic organizations. The Monterey Tree Growing Club has raised and donated thousands of ornamental trees for park, school and highway planting, and recently the club presented the California Highway Commission, for public use, 1,000 oak trees of several kinds. Most of these trees will be set out in Yolo, Sacramento and Tulare counties.

While the Monterey Tree Growing Club is really interested only in the use of trees for soldier memorial purposes, it uses its good offices in encouraging high schools to organize tree clubs. The great value of trees, both for beautification and

utility, makes the movement for active planting one that deserves energetic prosecution. Trees planted along highways not only furnish beauty and shade, but have a beneficial effect in protecting the concrete or macadam surface from excessive temperature changes.

At its last meeting, the California Highway Commission received six inquiries about highway tree planting. The active prosecution of this work is being undertaken by the commission in cooperation with the State Board of Foresty and the local authorities interested.

Notes and Comments

California Leads States in Building Outlook

The greatest building activity in this country this year will be in the industrial states, according to a forecast of the building outlook made by the Committee on Statistics and Standards of the Chamber of Commerce of the United States.

It is pointed out by the committee that there will be a good many business buildings erected in 1922, and a large number of them will be in the shape of alterations and enlargements. According to the committee, California leads the other states with respect to probable construction, while good likelihoods of construction lie in the Central West and in the East.

Three factors enter largely into the problem of building during the coming months: the high price of material, high price of labor and the question of obtaining funds for construction. Prices of material, on the whole, are much the more favorable of the three factors. It is only here and there that there is any apparent difficulty in this respect. The matter of too high priced labor does not figure so well as that of material, but there is a general belief that not only are matters improving in this direction, but when springtime comes the long period of probable idleness of labor will naturally tend to bring about a much more favorable solution of this problem than is now presented.

The matter of obtaining money for construction is the most difficult problem of all. It is not that money seems to be so high in price as that it is hard to get.

Apparently when construction gets well under way it will comprehend a great many dwelling houses in its purpose and intent; this because of the supreme necessity of more adequate housing almost everywhere.

There also will be a very large number of educational buildings, such as churches, schools and additions to colleges and universities. The numerous "drives" for funds set on foot by all sorts of educational institutions will bear fruit in many new buildings this spring.

Few things tend to hasten the return to better times more than the building industry. Things used in the building of dwelling houses call upon virtually all the industries of the country for their products. A general and far-reaching construction program in this country in 1922 is the best possible harbinger of a return to more prosperous conditions.

Architects and Advertising

There seems to be a growing curiosity throughout the country as to just how far architects and engineers are going in regard to advertising their respective professions. The following letter, addressed to the editor, under date of January 17, 1922, from a Kansas City advertising firm, indicates this trend of inquiry:

> We are interested in knowing just what has been done in the way of advertising by architects, and are taking the liberty of writing you.
>
> We would like to know how this profession looks upon advertising at the present time, what action has been taken, or plans made along this line. Also, we would be grateful to have you refer us to any individual advertising that has been carried on by architects, or advise us of some other source of information.

(Continued on page 112.)

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With the Architects

Building Reports and Personal Mention of Interest to the Profession

Meyer & Johnson Busy

New work in the offices of Meyer & Johnson, Bankers' Investment building, San Francisco, includes a five-story lodge building for the Bakersfield Elks to cost $300,000; a one-story reinforced auto sales building at 14th and Harrison streets, Oakland, for the Haynes Company to cost $30,000, and a reinforced concrete drill tower for the San Francisco Fire Department to be erected at the foot of Eleventh street to cost $40,000.

C. W. Dickey Gets New Appointment

Mr. C. W. Dickey, who has been connected with the construction department of the Oakland Board of Education as Supervising Architect for the past two years, has been appointed architect for the remaining schools to be erected under the bond issue, and he will receive six per cent of the $2,500,000 yet to be expended on new school buildings. Mr. Dickey is planning to occupy offices on the second floor of the building at Broadway and 21st street, Oakland.

University to Have Bowl

The Regents of the University of California are reported to have definitely decided to construct an earthen "bowl" in Strawberry Canyon, University campus, Berkeley, instead of the proposed steel and concrete stadium planned by Architect John Galen Howard. The proposed "bowl" will have a seating capacity of 75,000. Messrs. Baker & Carpenter, 58 Sutter street, San Francisco, are the engineers.

Claremont Residences

Plans have been prepared by Architect W. H. Ratcliff, Jr., of Berkeley for two residences in Claremont, one for Mrs. H. G. Peake to cost $17,000, and the other for Mr. Chas. L. Wooll to cost $12,000.

San Francisco Residence

Plans have been prepared and a contract has been let for a large residence in Seacliff, San Francisco, for Mrs. L. Martin. Mr. M. V. Politeo with offices in the First National Bank building, San Francisco, is the architect.

Record Month for Building Permits in San Francisco

San Francisco is coming back to her own in building construction, if the records of Building Inspector John P. Horgan for the month of January are to be taken as a criterion. According to Mr. Horgan the permits for the month totaled $5,528,978, which is the largest total for any one month since 1906. Permits for 210 frame structures alone estimated to cost $1,271,402, indicate an appreciable revival of home building.

Oakland Office Building

Bids have been taken and a contract will be awarded to Mr. R. W. Littlefield, Everson building, Oakland, for the construction of an eight-story Class "A" office building at 17th and Clay streets, Oakland, for the Pacific Gas & Electric Company. The structure will cost $318,500. Mr. C. W. Dickey is the architect.

Two Bank Buildings

Architects George C. Sellon & Company of Sacramento are completing plans for a one-story monumental bank building for the Sacramento branch of the Bank of Italy.

Plans have been completed by Architect E .C. Hemmings for a reinforced concrete bank building at Placerville for the El Dorado County Bank. It will cost $40,000.

Residence and Apartments

Architect C. O. Clausen has completed plans for a $20,000 residence in St. Francis Wood for Mr. Arnold Haas and plans are being prepared by Mr. Clausen for a three-story store and apartment house to be built at 23d avenue and Geary street for Mr. Robert Smith of 600 21st avenue.

Officers of Architectural Club

The following officers were elected at the last regular meeting of the San Francisco Architectural Club: William Watson, Jr., president; Mark T. Jorgenson, vice-president; James F. M'Guinness, Jr., secretary; John A. Peterson, treasurer; Fred G. Munk, C. R. Schmidts, H. E. Burnett, directors.

Reid Bros. Busy

Architects Reid Bros., California-Pacific building, San Francisco, report having considerable work on hand, including a large four-story reinforced concrete school building at Pierce, Fell and Hayes streets for the Greek Orthodox Cathedral; a nine-story Class "A" store and office building at Post and Powell streets for Mr. William Fitzhugh, and a one-story auto sales building on Pine street, near Van Ness avenue, for the Allyn estate.

Silver Cup for Home Builder

The Stockton architects have arranged for a silver cup to be given to the owner of the most attractive home, from an architectural point of view, erected each year in that city, beginning 1922. A jury of outside architects will determine the winner of the trophy. If rivalry to secure this prize can be stimulated it ought to prove advantageous to the architects of Stockton as well as to the city.

Berkeley Hospital

Architects Ashley & Evers, First National Bank building, Oakland, has prepared preliminary plans for a million dollar hospital project now being financed by the Temple Hospital Association, Inc. Mr. Richard L. Frye, president and manager. There are to be seven fireproof buildings. The association owns the property at Dwight way and Milvia street.

Pomona High School

Plans are out for figures for the Pomona High School group and bids will be opened on March 7th. Messrs. William H. Weeks and Robert H. Orr are the architects.

Another large school building out for figures is for the San Mateo Union High School District. W. H. Weeks is the architect and the estimated cost is $300,000.

$100,000 Church

Architect James W. Plachek of Berkeley has been commissioned to prepare plans for a $100,000 edifice for the Congregational Church at San Mateo. The design will be Spanish with terra cotta tile roof.

Shrine Hospital, San Francisco

Architects Weeks & Day are completing working drawings for the proposed hospital for children which the Shriners intend to build in San Francisco.

Granted Certificate

Mr. Geo. W. Hoover of Planada, Merced county, has been granted a certificate to practice architecture by the California State Board of Architecture.

Prior Estate Building

It is announced that the brick building at Mason and Eddy streets ,originally designed by Architect Earl Scott, and which has been standing in an unfinished condition for several years, is at last to be completed. The Prior estate, owners of the property, have reached an agreement to go on with the work which, it is estimated, will cost $200,000.

Much Residence Work

Architect Earl B. Bertz, 168 Sutter street, San Francisco, is preparing plans for two $20,000 residences to be built in Seacliff for the Allen Company; also for a residence and garage on Third avenue for Mr. William Farrell, and two $8,000 dwellings in St. Francis Wood for the Garden Homes Company.

Returns From Europe

Architect Warren C. Perry has resumed the practice of architecture after several months' trip abroad. Mr. Perry is also devoting considerable time to his duties as an instructor in the Department of Architecture, University of California.

Architect Hildebrand Moves

Architect E. H. Hildebrand has moved from the Foxcroft building, San Francisco, to the French Bank building. Mr. Hildebrand has quite a little work on the boards, including an apartment house, two flats and a residence.

Concrete Loft Building

Plans are being completed by Architect George W. Kelham for an eight-story reinforced concrete loft building to be built at Fremont and Mission streets, San Francisco, for the Walton N. Moore Company. The structure is expected to cost $250,000.

Architect Will Collaborate

Architect G. A. Lansburgh of San Francisco has been chosen to collaborate with Architects John C. Austin and A. Edelman of Los Angeles in the preparation of plans for the new Shrine Temple to be erected in the Southern California city at a cost of one million dollars.

Concrete Apartment House

Architects Morrow & Garren, Chronicle building, San Francisco, have prepared plans for a four-story reinforced concrete apartment house to be built on Turk street, near Leavenworth, San Francisco, at a cost of $45,000.

State University Building

Architect W. C. Hays of San Francisco has completed plans for a two-story reinforced concrete and tile horticultural building to be erected at Davis for the University of California.

Washington Chapter A. I. A.

The Washington State Chapter, American Institute of Architects, held its annual meeting at the Washington Hotel, Seattle, January 21st. Between seventy and eighty architects from the various centers of the state were present. Following the election of officers for the ensuing year many reports were read which indicated that the chapter had been active throughout the year and material progress had been made toward a better order of things in whatever it had undertaken.

Mr. Carl F. Gould of the firm of Bebb & Gould, Seattle, was chosen president; Mr. Louis Baeder, Seattle, first vice president; Mr. Frederick Westcott, Spokane, second vice president; Mr. A. J. Russell, Tacoma, third vice president; Mr. Harold O. Sexsmith, Seattle, secretary; Mr. Carl Siebrand, Seattle, treasurer; Mr. Charles H. Alden, executive committee member; Mr. Harlan Thomas, Mr. F. A. Naramore and Mr. J. H. Schack, delegates to institute convention.

The twenty-seventh annual dinner of the organization was held in the evening, Mr. Charles H. Alden, retiring president of the chapter, presiding.

Criticises Stadium Plans

Regardless of costs, the building and grounds committee of the Regents of the University of California does well when it reconsiders the plans for location and erection of the Berkeley stadium. The present plans provide for the wrong building in the wrong place. The design offended the sensibilities of a great many people to whom it suggested a Roman amphitheater, with its gladiatorial butcheries. As for the location, it appears to have been both financially and physically impossible. Reared 95 feet high in the midst of close built dwellings, the stadium would have been a disfigurement, and there would have been scant parking for automobiles.—San Francisco Journal.

Architect Reenters Private Practice

Mr. Daniel R. Huntington, who for the past twelve years has been city architect of the city of Seattle, opened offices recently at 1011 Alaska building for the practice of his profession. Mr. Huntington came to Seattle from the East in 1905 and up to 1910, when he became city architect, engaged in private practice.

Gilroy School Building

Architects Wyckoff & White of San Jose are preparing working drawings for a gymnasium and addition to the grammar school at Gilroy, Santa Clara county.

Important Decision of Interest to School Architects

The situation in union school districts in California has of late been complicated by the fact that the school law offered contradictory provisions with reference to the formation and election of trustees of union school districts; also by the fact that certain provisions of the law have been considered unconstitutional. Architects whose school work has been held up by these circumstances will be interested to know that the last State Legislature passed remedial legislation covering the inconsistencies of the law and that the following decision by Judge Sayre in the Superior Court of Lake County dis- There is now no reason why bonds issued by union school districts should be held up for either of these counts.

In the Superior Court of the State of California, in and for the County of Lake.

The People of the State of California, vs. Kelseyville Union School District.

This is an action wherein the plaintiffs seek judgment decreeing that all of the proceedings had, relative to the annexation, or addition or admission of the Big Valley School District to the defendant Union School District, be declared null and void and of non effect.

It appears to be conceded by all of the parties hereto that said proceedings were in all respects in full conformity with section 1591 of the Political Code of this state. (Added May 13, 1919.)

Plaintiffs allege and strenuously contend that said section 1591 is unconstitutional, null and void, in that it makes provision for incorporation and inclusion of land and territory embraced in a school district, into a Union School District, by the Board of Supervisors, upon petition of certain heads of families without notice of any kind or for any purpose.

In support of their contention plaintiffs cite the cases of Brooks vs City of Oakland, 160 Cal. 423, and People vs Van Nuys Lighting District, 173 Cal. 792. It is but fair to say that at the time of the commencement of this action said cases seemed to afford some justification for plaintiffs said contention.

Since the commencement of this action and on the 17th day of November, 1921, our Appellate Court, Second District, Division one, has rendered a decision (Antelope Valley Union High School District of Los Angeles County vs R. F. McClellan, Chairman of the Board of Supervisors, etc., 36 C. A. D. 735), upholding the constitutionality of sec. 1734, Political Code, which is very similar in its provisions to said sec. 1591 of the same code, in that no notice of annexation proceeding is required.

In that case the Court, after discussing the above entitled cases, says:

"In our opinion the power of the Board of Supervisors to annex the territory of an intermediate school district is measured by sec. 1734 (Pol. Code); that since it requires no notice to be given residents or owners of property in the district annexed, none is necessary; and that the Board of Supervisors has discretionary power to act whenever it appears that the provisions therein contained have been fully complied with."

I am therefore of the opinion that the power of the Board of Supervisors of Lake County to annex Big Valley School District to the Kelseyville Union School District is measured by said sec. 1591, Pol. Code, and that, since said section requires no notice to be given to residents or owners of property in the district annexed, none is necessary, and that said Board has discretionary power to act whenever it appears that the provisions contained in said Section 1591 have been fully complied with.

It follows that findings and judgment must be for the defendant, and counsel for the defendant is directed to prepare, serve and submit findings accordingly.

M. S. SAYRE, Judge.

Personal

Mr. Reginald D. Johnson announces Messrs. Gordon B. Kaufman and Roland E. Coate have joined him in a partnership for the practice of architecture under the firm name of Johnson, Kaufman & Coate. Offices will be maintained at 100 E. Colorado street, Pasadena, and 607 Union Bank building, Los Angeles.

Architect F. Manson White, with offices formerly at 823-4 Chamber of Commerce building, Portland, has moved to 449-50 Sherlock building, Seattle.

Mr. Charles H. Haynes, architect of Aberdeen, Washington, has been elected to an associate membership in the Washington State Chapter, American Institute of Architects.

Mr. Orrin E. Stanley, assistant city engineer of Portland, has been elected president of the Portland Municipal Civil Service Association for the ensuing year.

Architect Earl B. Scott died February 10th of consumption. Mr. Scott was at one time associated with Mr. W. H. Crim, Jr., architect of San Francisco.

Art Students' Annual Competition

A scholarship competition open to all art students in the United States, with the exception of those in New York City, will be held at the Art Students' League of New York on March 24.

Ten scholarships will be awarded to that work showing the greatest promise. Work in any medium, from Life, the Antique, Landscape, Etching, Portrait, Illustration, Composition, also photographs of Sculpture, may be submitted. All work should be forwarded so as to reach the League, 215 West 57th street, New York, not later than March 17th, and must be sent with return express or parcel post charges prepaid.

San Jose Buildings

Architect Chas. McKenzie, San Jose, reports having made plans for a $35,000 brick commercial garage for Mr. Norman Kooser; also he has awarded a contract for a $20,000 residence for Mr. Warren Pomeroy and he is preparing plans for altering the Columbia Hospital into modern apartments at a probable outlay of $20,000. Mr. McKenzie is revising plans for an $18,000 residence on The Alameda, San Jose, for Mr. Preston Boomer. Building in San Jose had just begun to show signs of a boom when the fight for the American shop was inaugurated.

Architects and Advertising

(Concluded from page 107.)

Thanking you in advance for cooperation in this, we are.

Architects, as a rule, do not approve of newspaper or periodical advertising, other than to use a professional card or print their names beneath a cut of a building designed by them. One San Francisco firm, however, uses half a page display in an industrial magazine to tell its readers that they are experts in planning industrial buildings and factories. Another architect advertises modestly as an "authority" on school architecture. The Idaho Society of Architects has adopted twelve standard advertisements, together with an architectural design for a setting. This system of propaganda, when used, is expected to eliminate much of the adverse criticism of the past by taking the public into partnership. The purpose of the advertisements will be to impress upon the public that architectural service, properly imparted, is quite as important a factor in civilized life as the service rendered by any other profession.

Architects Move

Offices are being fitted up in the new sixteen-story building at Montgomery and Pine streets, San Francisco, for Architects Weeks and Day, who will move from the Phelan building.

Mr. Geo. A. Lansburgh will move from the Gunst building, at Third and Mission streets, to the new Dunn-Williams building, at Montgomery and Bush streets, as soon as the structure is completed.

Architect Geo. E. McCrea has moved from Capitola to 318-19 Exchange building, San Francisco.

Architect Fred W. Quandt has moved from 984 Ashbury street to 616 Monadnock building, and Architect Paul de Martini has vacated his old offices at 2123 Powell street for larger quarters at 946 Broadway, San Francisco.

Architects Elect Officers

The Washington State Society of Architects held its annual meeting at Seattle in December, the out of town guests being Messrs. Watson Vernon of Aberdeen and Julius Zittel of Spokane. Mr. R. H. Rowe, Seattle, was elected president and Mr. R. E. Vincent, Seattle, secretary. After the banquet and election of officers, the evening was given over to social enjoyment.

With the Engineers

Reports from the Various Pacific Coast Societies, Personal Mention, Etc.

Engineers Too Timid and Too Modest

Mr. George R. Fansett, engineer with the Bureau of Mines, Arizona, and also on the staff of the University of Arizona, met with the officers and committeemen of the Los Angeles Chapter, American Association of Engineers, recently to discuss engineers and their problems.

Mr. Fansett, in summing up the accomplishments of the various professional men, stated that while the engineer has unquestionably done more for civilization than any other professional man, and if what has been accomplished by him, were to be wiped from the earth, humanity would be right back in the dark ages, yet he receives less appreciation and recognition from the public than either the doctor or the lawyer. This is the fault of no one but the engineer, himself, his inherent timidity and modesty keeping him from seeking the publicity to which his accomplishments entitle him.

No one can say that the engineer, who voluntarily renounces the comforts of civilization, immuring himself it may be for years at a time in a torrid jungle or an arid desert in order that humanity may benefit, is a physical coward. Yet Mr. Fansett believes that the engineer, in refusing to enter public life in an endeavor to correct some of the glaring faults of administration, when such exist, is a mental coward. The engineer has the one most important asset for entering into public life—he has the confidence of the public that he is honest. He attributes the failure of the engineering profession to reach its highest plane of advancement to the absolute unresponsiveness of the engineer as a citizen, his aloofness in all matters outside of his own profession.

Mr. Fansett stated there are three problems to solve with regard to the engineer. First, to solve the engineer, himself—eliminate cheapness, cut-throat tactics, penuriousness. Second, to educate the public to appreciate what the engineer has accomplished in material lines, to realize his value to humanity. Third, a thorough revision of the curriculum of engineering colleges. He gave it as his opinion that among the professors who are in charge of training prospective engineers, in many of our colleges there is much dead timber which must be cut out, if the student is to receive full value for the time he is spending in obtaining an engineering education. —Southwest Contractor and Builder.

Engineers Wanted

THE most vital need of the woodworking industry is a group of trained woodworking engineers, similar to those experts who have accomplished the wonders so apparent in the fields of mechanical, electrical, and civil engineering. It is true that we have a few engineers in the woodworking industry, but those engaged by manufacturers of furniture can be counted on the fingers of the hands. Some of these are university graduates of mechanical engineering, who largely through circumstances have entered the furniture field and applied their good training to its problems. Others are college men with a few years of experience gained in the Forest Products Laboratory, or a similar institution. Still others are factory trained men, with or without much schooling, but men of such ability that they have been able to grasp the problems as they came up and to solve them in a really scientific manner. Their reputation has spread, so that they are now acknowledged to be the production experts of the industry. The big problem of the woodworking engineer is the elimination of waste. Waste tends to maintain production cost at a high level in normal as well as in abnormal times.

What would the steel and iron manufacturers, who waste practically nothing, think of an industry which wastes close to 600,000,000 feet of hardwood every year?

The fact is known that to cut 1,200,000-000 feet of dimension stock—the annual requirement of hardwood—that it takes 1,800,000 board feet of lumber to do it, leaving, as sheer waste, 600,000,000 feet of lumber.

Six hundred million feet of lumber at an average cost of $40 per M gives an annual waste of $24,000,000,000. Every manufacturer using dimension lumber contributes his share toward this immense sum, and every consumer of hardwood products eventually pays the bill.

And this item is not alone when one figures waste in the woodworking industry. What about the freight on the six hundred million feet that eventually goes under the boiler? What about the shrinkage in kiln drying, dry rot, checking, warping, honeycombing, etc.?

Labor wastes are so well known that it is useless to enumerate them. There is hardly a factory worker today whose efficiency runs much over 60 per cent. as

compared with many of the other industries where mechanical engineers have attacked the problem of mechanical aids to human endeavor, and thus greatly increased the output per man.

Many factories in which furniture is being manufactured are run today on practically the same basis on which they were run fifty years ago. The average manufacturer is still more interested in the marketing of his product than he is in its manufacture. How sensible it would be if he would forget about his sales force long enough to give his production end a bit of serious attention and how sensible it would be if he were to endeavor to interest our engineering schools in this problem.

We feel that this is a large enough problem for serious discussion in the meetings of the national associations of furniture manufacturers. We know that if the associations were to get back of this thing and push it with vigor, it would bring forth good results—good, not only for the woodworking industries—but for the great American public as well. Let our motto always be, "A trained engineer in every furniture factory."—The Furniture Manufacturer.

Clipping Filing System for the Engineer

It is very generally recognized that a collection of clippings from technical and other magazines and papers is of great value if the clippings are filed in such a manner as to be readily accessible. A useful method for handling such clippings is described by Mr. S. L. Sinclair, Engineer, Minidopa Irrigation Project, in the July Reclamation Record.

The method requires the use of a standard filing cabinet, with 6 by 9 in. drawers.

A page from a standard technical or similar magazine usually measures 9 by 12 in. and when trimmed and folded once will fit a 6 by 9 in. drawer. A full-size index card is used for each subject and when a clipping covers more than one subject and does not permit separation, in some cases the subject matter of each being on opposite sides of the clipping, a separate card is filed to cover one of the articles on the clipping. The data on the card covers the subject matter of the clipping and shows under what subject the actual clipping is filed.

For example, a clipping with reference to "Testing water wheels after installation," has on the reverse side an article relative to "Standard colors for power station piping." The clipping is filed under Water Wheels and a separate card is filed under Piping System. On this card is written: Standard colors for power station piping; filed under Water Wheels; see Testing after installation. In the case of small clippings they are pasted on 6 by 9 in. cards, which are filed in the usual manner.

A cross index is used when necessary to list or index a single clipping requiring more than one key word or title.

In a six-drawer file Mr. Sinclair now has approximately 600 index cards with subject matter. The last twenty and odd cards are indexed as follows:

Water, water hammer, water measurement, water motors, water power, water proofing, water treatment, water wheel, weighing machinery, weights and measures, welding, wells, winches, wire, wire prices (this is on a blue card), wiring, wiring diagrams, wiring prices (this is on a blue card), wiring rules, wiring tables, wood working, vehicle equipment, zinc. In some cases a large amount of data may be filed under a single card.

Innumerable valuable articles are read and forgotten which, if filed, would be of great value for future reference. In such cases it is generally impractical to retain the entire magazine or paper on account of the large accumulation that would result, and if retained it is of little value owing generally to lack of an index.

Removable Car Roof

A removable roof for freight cars so that lumber may be loaded in packages by locomotive crane is one of the waste prevention devices to which the National Lumber Manufacturers Association has been devoting some attention during the past two years.

So far it has been unsuccessful in interesting manufacturers of freight cars in this innovation to the extent of active cooperation although a number of them have been addressed on the subject. Some of the carbuilding requirements now in force would have to be modified somewhat to permit of such a roof, but this is not thought impossible by car manufacturers and the removable roof is considered an entirely feasible device. The plan is now in abeyance but has not been abandoned.—The National Lumber Bulletin.

The Cost of Expert Engineering

A joint committee of the City Council and Civic Commercial Association of Bakersfield has decided to recommend the rejection of the Olmsted report on a municipal water system. This report estimates the cost of a system to supply the needs for a population of 50,000 at $1,500,000. One of the reasons given for rejecting the report is that its adoption would involve the payment of an engineering fee on the total cost of the system, including the purchase price of the existing water plants in Bakersfield. This fee is approximately 4¾ per cent, or a total of $69,000. For expert engineering of a project of this kind the fee asked is not exorbitant, although it may appear to the layman to be very large.

The Contractor

BUILDING CONSTRUCTION, BRIDGES AND ROAD WORK

Annual Convention Associated General Contractors of America

(By Our Special Correspondent.)

A DEFINITE assurance that construction recovery is under way and that it is the first phase of a general business revival sums up the results of the construction conference held in Cleveland January 17 to 19 by the Associated General Contractors of America. Evidence of this fact, both statistical and informal, abounded in the discussion of the delegates and in the papers presented as a part of the program.

Col. Leonard P. Ayres, who was chief statistical officer of the A. E. F. and who is now vice-president of the Cleveland Trust Company, expressed the belief that prices will continue to fall, intermittently, for ten or twenty years more, but conveyed assurance that the construction industry will be immune to many of the embarrassments of the coming period, because it supplies a market in which there is a latent demand equal to 2¼ years' normal production of building.

"In other words," said Col. Ayres, "construction can go along for nine years at 25 per cent above normal and only fill the normal demand by the end of that time."

Col. Ayres said that building finance problems had commenced to adjust themselves, through greater abundance of money. "The acrimonious discussions between yourselves as contractors and ourselves as bankers are about over," he remarked. "Within six months so much money will be available for borrowers that owners will be able to arrange building loans on pre-war terms."

Charts shown by Col. Ayres indicated a subnormal volume of building for every year since 1912. Even the apparent large building figures for 1919 and 1920 were only apparent, he declared. The cost was large but the building was far behind even the current needs of the time. The only time in the last nine years when the volume has gone above average requirements was for the last few weeks of October, 1921. This was chiefly residence building, but it shows in Col. Ayres' opinion that the tide is rising rapidly. He declared that building prosperity is always the first phase of general revivals and that it disseminates prosperity more widely than any other type of activity.

Determined not merely to predict prosperity, but actually to observe it, the constructors arranged a program in which the theme of waste elimination was constantly emphasized.

Mr. J. Park Channing of Boston, who succeeded Herbert Hoover as chairman of the Federated Engineering Organizations, gave the major paper of the conference on this subject and said that 25 per cent of the responsibility for waste rests on labor, 50 per cent on management and the remaining 25 per cent on outside relationships. In respect to industrial accidents, however, he asserted that 85 per cent of the responsibility rests on the individual workman.

Constantly changing personnel is a case of waste treated by the speaker and he recommended measures to increase the period of active work so that employment will be more nearly an annual affair. He expressed faith in the method of reasoning with employees rather than ordering them, when labor emergencies are encountered. Material control was treated as a major time-saving proposition in the building business.

Mr. F. L. Cranford of New York, former government director of the Muscle Shoals nitrate plant, discussed a 20,000-mile trip taken by officers of the association in the interest of construction revival. He expressed the opinion that labor has reached pre-war efficiency and that the chief retarding factor is the general belief that material is too high, "particularly materials controlled by national associations that meet behind closed doors."

Cost-plus contracts, fee contracts and efforts made in some projects to eliminate the general contractor were discussed. Mr. D. A. Garber of New York voiced the belief that few architects and engineers can qualify to direct a building project in the place of the general contractor. Mr. Godfrey Edwards of Los Angeles decried anything but lump sum contracts, believing that when a builder takes a job on a cost plus or a fee basis

he is paving the way for his own elimination.

The conference acted favorably on the Kenyon bill, to create a reserve fund that will stimulate construction in depressed periods.

Mr. Otto T. Mallery, from the Department of Commerce, urged that 10 per cent of all public construction funds be set aside in such a reserve, each normal appropriation for that year.

Other speakers at the convention were Mr. Ernest T. Trigg, of Philadelphia, president of the National Federation of Construction Industries, whose subject was "Co-operation in Construction," and Col. Evan Shelby, New York attorney, who was formerly legal advisor to the construction division of the army, who spoke on "Organization in Construction."

"The opportunity before the construction industry is very great," Mr. Trigg said, "if and when the public's confidence is secured.

"We have passed the stage when the employers and the employees can get together with themselves and with each other and determine the affairs of the third party, the public. The public has come back into its power.

"But, until we come to where the public's confidence is restored, construction is not going to revive."

"The obligation rests with the leaders in the construction industry to clean house," Mr. Twigg emphasized. They must, he said, see that the customs of the trade which hold up costs and neutralize the effects of competition, be done away with. They must also, he said, take the initiative in promoting more cordial and economical relations with their workmen.

"You must not take advantage of the fact that now you have the whip hand," Mr. Twigg asserted. "By taking the broad view of things right now, you will bring about a condition of peace in industry where both you and your employees will share in ungrudged prosperity."

Col. Shelby outlined the steps by which the general contractors were organized for the first time during the war, an organization which preceded the one just closing its convention, and pointed to the accomplishments of its short existence as forecasting the progress which will be realized by simplifying the forms of contract, promoting research in industrial methods and improving the relations of the contractors with the material dealers and workers.

Mr. Arthur S. Bent of Los Angeles was unanimously elected president, and he made a splendid appeal for "Idealism in Construction," saying in part:

> The industry that we represent is not alone very great; it was the only hope of a shattered world lying almost in ruins only yesterday. Men may fight and destroy for a time, they can build forever, and the very continuity of life itself depends upon construction.
>
> In thinking of our A. G. C. I have wondered if sometimes you thought that I was too much of an idealist. It is a profound truth that no institution can continue to exist without genuine moral worth. If that is true, then the measure of our vitality will be our moral worth. If the A. G. C. should ever stand for being served rather than serving, for having rather than being, for getting rather than giving, then it will cease to achieve any success that will be worth our time and effort.
>
> But that has not and never has been the spirit of this organization, and please God it never will be! Victor Hugo tells us that the world lets everything die that is moved by selfishness, and the reason the A. G. C. is such a lusty young giant tonight is because it is inspired with a spirit of unselfish co-operation between ourselves, a desire to serve our public more worthily and a purpose to lift our craft to higher levels of integrity and honor.
>
> There is a very beautiful legend, an impressive one, I think, so old that its origin is lost—I have never been able to discover it. It goes like this: Four men stood up with God when He made the world, and watched with wonder as the shimmering sphere flung from the fingers of Omnipotence, found the place in the shining galaxy of stars, and one of the men said, "How was it done?" And God said to him, "Go, find out for yourself." And that man went and became a scientist.
>
> And the second man said, "What is it for?" And to him God said, "Go, find out for yourself." And he went and became a philosopher.
>
> "Give it to me," the third begged. And to him God said, "Go, possess it for yourself." And he went out and became the business man.
>
> The fourth said nothing, but fell down and worshiped, and God said to him, "You, too, shall go and because your soul burns within you, you shall creat beauty," and that man went and became the artist.
>
> Now may we not, reverently and not unfittingly, add to this noble group of God's journeymen the constructor? We who forerun and always have all the others? We who have straightened the path for their feet? We, without whom their high destinies could not be wrought out and by whom all their visions are crystallized? We work and delve for science in its onward march, and harness its magic to ways of usefulness. The bewildering and marvelous structure through which business functions is the work of our hands. Philosophy leans upon us heavily to demonstrate its theories of life, and even to art we give its tools and make its dreams of beauty imperishable.
>
> We are the hands through which nearly all of human thought and all of material progress are expressed. Through our highways and railways and lighting and heating and temples and schools and homes we touch all life intimately and come very close indeed to the heart of humanity, and with that vital and varied contact comes to us an impressive but inspiring responsibility. It is given to us, if we see it rightly, to raise the standard of every man's service by the fidelity of our own.
>
> I make no apology for such idealism in an organization like this because whatever our industry is today is the sum total of the thoughts that all the contractors in the world have about it, and it never will rise above that level. And as that level advances to higher planes of integrity and service, we shall travel further and further away from that stigma of sordidness which has clouded our history in the past, and it is given to the A. G. C. to carry that bright banner in the very vanguard.
>
> Of course ethical achievement is not statistical. We can't measure our progress along those lines. Nevertheless, I firmly believe, and you do too, that it will be our real, our most profitable progress, and the span of our activities is not limited to our own present interests.
>
> We are trying to make contracting a finer thing for those who will come after us. We are consciously sowing seeds which will be harvested by those whom we can never know. Is there any finer thing in life than that?

Overhead in Construction Work*

By M. J. REINHARDT, M. A. C. E.

IN considering "Construction Overhead," the writer has seen fit to take two divisions of the overhead cost, which expense is so frequently overlooked in estimates, but which necessarily and surely enters into the cost of all construction work.

These two divisions are: First, the general overhead expense or that which is necessary for the maintaining of a construction organization to carry on such business; and second, the contingent overhead expense or that which is brought about by the above organization performing some specific construction operation or contract job. The first will naturally vary with the size of the organization or firm and with the scope of the construction field covered by it; the second will remain about the same for a given work, whether the firm employed is large or small, and is contingent in amount upon the work performed.

General overhead which is very small for certain small contract workers, runs into considerable proportions for firms organized to handle proficiently large undertakings.

Thus, two mechanics may contract to plaster a house at so much per yard for the labor, or to lay brick by the thousand, performing practically all the work themselves. While they may have to spend certain of their time in getting such work, so does the mechanic working by the day or by the hour, and, it may well be said, the general overhead expense for such individuals is practically nothing.

Gradually these same men, working as a firm, take on larger work or contracts where materials have to be purchased by them and where it is necessary for them to employ labor. They soon find the need of a bookkeeper, an office or place of business, and files and office equipment. Finally, a corps of estimators and detailers become necessary and they must have construction equipment and invested capital. As the firm expands and covers larger territory, branch offices are required in the locality where the work is being done, which means more clerical work at home, more analyzing of costs and more detail work in order to promptly purchase material on a larger scale and carry on their operations successfully. This expense is what the writer has termed general overhead and it includes such items as salaries and traveling expenses of men devoting their time to general supervision and to getting contracts, salaries of estimators and detailers and clerical help, office rent, insurance, interest paid out, taxes, reports and advertising, general depletion and obsolescence of equipment on hand, wire service, office supplies, etc. Should the above items total thirty thousand dollars expense per year for a firm doing one million dollars' worth of business per year, this general overhead would amount to 3 per cent. of the gross income; and, since the firm's source of revenue is obtained from compensation paid to it for performing construction work, it must necessarily be paid this item of 3 per cent. general overhead as an item of expense, in order to realize just compensation for the work performed.

In considering the second division or contingent overhead, this can best be analyzed by considering the items of expense which enter into a specific operation, for instance, a cubic yard of concrete in place in an average highway bridge, such as is frequently awarded on a unit bid proposal by the engineer in charge. These items are:

No.	ITEM	
1	Portland cement, 1½ bbls. @ $2.80	$4.20
2	Drayage on 6 sacks @ 4c each	.24
3	Return of 6 empty sacks (and loss)	.05
4	Crushed stone .84 yds. @ $3.00	2.52
5	Drayage on stone .84 yds. @ $1.00	.84
6	Sand .42 yds. @ $2.50	1.05
7	Drayage on sand .42 yds. @ $1.00	.42
8	Water	.20
9	Form lumber 100 ft. B. M. @ $35.00	3.50
10	Carpenter labor on forms, 100 ft. B. M. @ $30	3.00
11	Hardware (nails, wire, etc.)	.20
12	Fuel, oil, etc.	.08
13	Labor for mixing and placing	3.00
	Material and labor cost	$19.30
14	Freight on equipment	.40
15	Plant set up	.50
16	Rental on equipment	.20
17	Liability insurance	.25
18	Bond premium, 1½% of total cost	.36
	Contingent overhead	$1.71
19	General overhead 3% of total cost	.72
	Contractor's cost	$21.73
20	Contractor's compensation 10% of contractor's cost	2.17
21	Total	$23.90

The first thirteen items represent the cost of labor and material in the common usage of the terms, while the next five items, fourteen to eighteen inclusive, are those items which the writer has termed contingent overhead. In this instance they are charges for getting machinery and equipment to the place where the work is to be done, placing the equipment in position to do the work, the wear and tear and maintenance on equipment, the liability insurance which is the employer's insurance against the responsibility imposed upon him by law to take care of injured employees or the injured public, and last the bond premium which most construction operators carry to protect the owner against loss or default on the part of the contractor.

*Paper presented before the Oklahoma Chapter of the American Association of Engineers at annual convention, Oklahoma City, Okla., October 27, 1921, and reprinted from the Contractor's Bulletin.

These are all items of expense which enter into the cost of the operation or work, and cost about the same whether the construction firm be large or small so long as it has the facilities and ability to perform the work in the regular way; and while they are items of expense entirely apart from labor and material actually put into the structure, they may best be termed contingent overhead expense.

Such contingent overhead expense may be very limited or almost negligible under some local or ideal conditions and may be so heavy in some exceptional cases as to exceed the cost of all other items combined, such as that encountered in contracting to furnish and drive a bent or two of piling in an isolated location penetrating a difficult material, or contracting to surface the floor of a bridge with sheet asphalt in an isolated location. In either case it is readily seen that the transportation of equipment, together with that of a few necessary skilled mechanics, might easily double in total cost the average units cost for such work. Therefore contingent overhead should be estimated for each particular operation.

Assuming that the above cost analysis of the yard of concrete in place is a fair average condition, the expense of what is commonly termed labor and material is $19.30. The contingent overhead is $1.71, the general overhead 72c. These latter two items combined amount to $2.43 or about 10 per cent. of the total cost and thus exceed in amount the fair allowance of contractor's profit or compensation based upon 10 per cent. of the contractor's cost.

While society is gradually shaping our affairs to increase the general overhead by requiring better equipped and more talented organizations in order to produce better structures, increasing taxes on capital invested and incomes, increasing contingent overhead by the introduction of workmen's compensation laws, requiring surety bonds, etc.; is the engineering profession giving due consideration to this item of cost "construction overhead?" Those of us who are devoting our energies mainly to construction work or general contracting often realize its overwhelming power too late, still following the old school methods of preparing estimates, which were in vogue when overhead was a very small factor in costs.

In conclusion, the endeavor has been to leave this one thought with you; that overhead costs are necessary and essential in our present day methods of carrying on construction work, and should be given the same consideration and looked upon in the same light as other legitimate costs entering into the grand total of expense for doing the work.

How Much Building Is Needed?

WHAT is the amount of construction necessary to bring the building situation back to normal? A survey has been completed by Building Age, showing the requirements of cities over 25,000 inhabitants and those under 25,000. The following table shows the number of buildings which, if erected immediately, would meet present needs:

CITIES OVER 25,000 POPULATION

	Total Cost
Houses: 319,528 needed	$2,025,501,000
Apartment Houses: 2,582 needed	64,296,000
Schools: 457 needed	74,491,000
Office Buildings: 200 needed	52,851,000
Miscellaneous Buildings, such as hospitals, hotels, garages, factories, etc.: 628 needed	71,867,692
Total expenditures to relieve present shortage	$2,289,007,092

CITIES UNDER 25,000 POPULATION

	Total Cost
Houses: 822,905 needed	$3,352,588,500
Apartment Houses: 18,967 needed	644,878,000
Schools: 4,917 needed	698,214,000
Office Buildings: 4,412 needed	480,908,000
Miscellaneous Buildings, such as hospitals, hotels, garages, factories etc.: 12,645 needed	619,389,000
Total expenditure to relieve present shortage	$5,795,987,340

Questionnaires were sent to Chambers of Commerce throughout the country, asking what construction was necessary in their particular towns. Twelve per cent of the cities reported no buildings were required. In these cases some special condition was cited as a cause, such as excess construction to meet war needs.

Labor Cost in Building Six Room House

The following are preliminary figures, furnished by the Department of Commerce, Washington, D. C., showing the percentage which the amount paid to each labor group bears to the total labor cost of a six room house:

Total Labor Cost 100%

Trade	Frame house	Brick house
Carpenters	49.6	32.2
Bricklayers	6.2	21.5
Hod carriers	2.2	6.7
Plasterers	7.9	8.8
Plumbers	8.7	7.6
Electricians	2.6	2.5
Painters	10.0	6.3
Common laborers	6.3	9.9
All others	6.5	4.5
Total	100.0	100.0

These averages were constructed from reports covering a large number of six room brick and frame houses throughout the country.

The relation of the amount paid to the various groups to the total labor cost varies according to the types of construction prevailing in the various localities; however, these averages give a fair view of the general distribution of labor costs.

Notable Decline in Building Costs

The impression persists in the minds of many people who would like to become home owners, that building costs are still abnormally high, and that in order to build economically they must wait.

The Engineering News Record has recently published an index of construction costs which is given in the table, for the years 1920 and 1921. The index number represents the cost of construction for those years as compared with the cost in 1913, the figure 100 being taken as the index for the year 1913.

From this table it will be clear that the peak of construction costs was reached in June 1920, with an index number of 273, as compared with 100 in 1913; while in November, 1921, its cost had dropped to 166.

	Construction Cost Index Number
1913	100.0
1920—	
January	206.55
February	225.10
March	240.85
April	265.20
May	268.90
June	273.80
July	265.60
August	252.00
September	255.20
October	255.20
November	255.37
December	251.62
1921—	
January	230.87
February	230.67
March	224.27
April	213.02
May	210.82
June	209.82
July	203.82
August	193.07
September	188.27
October	182.57
November	166.32

Wash in the Fountain

Something new in lavatory fixtures has been introduced. It is a device called a washfountain, and wherever it has been installed has proven entirely satisfactory.

The fountain may be used wherever large wash-rooms are necessary; in factories, schools, public buildings, hotels and railway stations—in fact every public or industrial lavatory.

Considerable economy is effected in the amount of water consumed. The washfountain built to accommodate twelve people, for instance, uses no more water than the amount piped for one washbowl. This is accomplished by converting the flow into a fine stream—just as effective. Hot water costs are also reduced, since the water may be heated at any desired temperature, evenly.

The fountains are manufactured in two sizes—a fifty-four-inch basin to accommodate twelve people, or a smaller, thirty-two inch, where six people may wash at one time. Due to the circular construction of the fountain there is plenty of "elbow room" for the comfort of the users.

Book Reviews

Edited by AUGUST G. HEADMAN, Architect

HOMES OF MODERN SIZE—By Kenneth W. Dalzell, Architect. Published by U. P. C. Book Company, 243 West Thirty-ninth Street, New York City.

Selected from the work of Kenneth W. Dalzell, architect, M. A. I. A., and arranged and edited by Edward F. Hammel, architect, is a collection of attractive well studied designs with plans of logical homes for the average American family.

All illustrations are of exceptionally clear quality, well arranged and printed on heavy paper of unusual stock.

The preamble and other text should prove of special interest to the layman and architectural profession inasmuch as it states very clearly the understanding that should exist between client and architect. An understanding which all architects feel is seldom apparent in his client and a quality which is absolutely necessary in order to produce a successful conception and solution of all problems envolved in the complete solution or any structure.

PRACTICAL GEOMETRY—By J. E. Paynter, Lecturer in Building Subjects, University of London. Published by E. P. Dutton & Co., 681 Fifth Ave., New York City.

This treatise is a simplified presentation of the application of geometry for the practical men engaged in architecture and civil engineering, also the student and all others engaged or interested in building construction.

The contents of the book throughout are written with a view of solving many the usual common problems that occur in actual workshop practice.

The work should prove a valuable textbook for the use of students in technical and other trade schools.

"PROBLEMS IN ARCHITECTURAL DRAWINGS"—By Bush-Bruce Publishing Co., Milwaukee, Wis.

This book contains an elaborate set of plates of related architectural drawing problems in a form which will enable the student to clearly visualize the problems presented. The set comprises two series of plates and should be of especial value for the use of the instructor or student in "checking up" or correcting the student's drawings. The plates shown include framing details, basement plan, first and second floor plans, wall section, porch cornice, door and window details, front elevation, etc.

Architect to Build Home

Mr. William H. Weeks, well-known San Francisco school architect, is preparing plans for a home for himself to be built in Piedmont. It will cost in the neighborhood of $20,000.

Passing of Mr. Bryson

Mr. Hugh W. Bryson, contractor and builder of Los Angeles, died recently at the Shoreham hotel, Washington, D. C., of heart disease. He was preparing to return to Los Angeles when stricken. Mr. F. E. Engstrum, brother of Mrs. Bryson, who resides in Washington, took charge of the body and funeral services were held there, followed by cremation. Mr. Bryson built the Rampart and the Bryson apartments in Los Angeles. He was born at Memphis, Tenn., in 1868, and came to Los Angeles twenty years ago. He was for many years identified with the F. O. Engstrum Company.

Zoning Long Beach

A zoning system for the city of Long Beach is being drafted under the direction of Mr. Charles H. Cheney, city planning expert. The work was started in the Belmont Heights district where requests for restrictions in uses and types of buildings have been made. Neighborhood meetings will be held to insure creation of zones satisfactory to the people. Linked with the zoning scheme are the municipal park project, harbor development and relocation of the municipal auditorium. Acquisition of Beach frontage will be undertaken as a separate project.

Designing Big Hotel

Editor The Architect and Engineer,
San Francisco, California:

I wish to call your attention to an article on page 111 of your December, 1921, issue, in which you quote that the R. F. Felchlin Company are architects of the proposed Sun Maid Hotel of Fresno.

This should read "The R. F. Felchlin Company and H. Rafael Lake, associated architects and managers of construction."

Mr. Lake is a local architect in San Francisco. Yours truly,

RAYMOND R. SHAW,
The R. F. Felchlin Company.

Not Always Easy But it Always Pays

—to apologize
—to admit error
—to take advice
—to forgive and forget
—to begin over
—to keep on trying
—to be considerate when the other fellow isn't
—to be unselfish
—to be charitable
—to shoulder a deserved blame
—to think and then act
—to profit by mistakes

Lonesome Without The Architect and Engineer

Editor The Architect and Engineer,
San Francisco, California:

I am enclosing a check for three ($3.00) dollars for one year's subscription to your magazine ($2.50) and fifty cents additional for the one copy of the November, 1921, issue, the one dealing with the houses at Pebble Beach and Del Monte. I hope that you have an extra copy of this splendid number. Kindly start the subscription with the January issue of 1922.

I do not know if you remember me. I was in Mr. Ratcliff's office in Berkeley for some time. I miss seeing your publication as it is the only one dealing with purely Western work and news in architectural circles.

I trust the new year will be a successful one for you and the magazine.

Very truly yours,
HATHAWAY LOVELL.

10 Blake Road, Brookline, Mass.

Roofers in Cut-Throat Competition

Editor The Architect and Engineer,
San Francisco:

We understand from the roofers that while the figure of $7 per square on a 5-ply felt and gravel roof for less than 30 squares and $6.50 per square for 30 squares or over is what they would like to get, they are taking jobs somewhat cheaper; in fact, we understand that they are taking them so cheaply that none of them are making any money. In other words, it seems to be a case of cut-throat competition on the felt and gravel roof and in consequence everyone suffers.

DEALER.

Opens Los Angeles Office

The Dorite Manufacturing Co. of New York and San Francisco has opened a Los Angeles office at 600 Metropolitan building. The company is engaged in the mining of magnesite, having deposits in Sonoma county, and manufacture of stucco, flooring and table tops. Its products have been in use about 10 years, the company having operated largely heretofore in Northern California. Recently it has extended its field to New York state and the Hawaiian Islands. Mr. E. Hall Faile, well known New York architect, is the head of the company.

Los Angeles Building for January

During January, 1922, the Los Angeles city building department issued 3416 permits for structures with an estimated valuation of $7,975,168. This is a gain in valuation of 141 per cent as compared with January, 1921, when 1871 permits with an estimated valuation of $3,301,714, were issued.

Testing and Inspection of Building Materials

By R. R. DEANS
General Manager, Canadian Inspection and Testing Co., Toronto.

THE testing and inspection of building materials is to some extent looked upon by not a few architects and engineers as a novelty. Others place it in the same category as fire insurance and in some respects this classification is correct. We insure our valuable properties against loss by fire and the builder should insure his most valuable building materials against loss by failure. The engineer should guard his reputation through possible loss through failures, as such an instance, from whatever cause, attaches itself to the name of the engineer whether he is in any way responsible or not. The only time fire insurance is appreciated is after a fire; similarly the time when the services of an inspection company are appreciated is after a failure.

The necessity for testing Portland cement before using it is recognized by the most up-to-date engineers and architects. It may be argued that if the cement be obtained from a firm enjoying a good reputation there is no need for tests. This is only partly true, as the best cement manufacturers make mistakes. Your protection is the individual test by a reputable firm of inspection and testing engineers. Faulty concrete cannot be taken apart, pulverized and analyzed with a view to ascertaining that it was the cement that was at fault. The cement must be tested before it is mixed with the other ingredients.

In connection with sand, some engineers may be able to say, from visual examination, whether or not a sand is carrying a high percentage of silt, but it is impossible to say what percentage of organic matter is present in the sand. The only proper method of accepting or rejecting a sand is by the laboratory test. Many concrete failures have been attributed to faulty sand. It may be said that the sand proposed has already been used in other structures with no ill effects. However, all sands from the same pit are not equal in quality. Careless handling of the over burden and failure to remove the clay pockets are two of the frequent causes of trouble. Sand is the second material in importance used in concrete, and no contractor or engineer or architect can afford to overlook the possibilities of trouble from that source. Many of the concrete failures that occur are attributed to improper sand.

Compression tests of standard cubes or cylinders of concrete taken from the forms immediately after pouring is a first class protection, as you obtain the actual compression strength of the concrete as it stands in the work. Good cement, good

sand and good stone may be made into poor concrete by faulty handling. The compression test is, therefore, the acid test of concrete.

When we think of the important uses to which concrete is put, as for instance, foundations, floors, etc., we cannot fail to see the necessity of knowing the character of its most important ingredients and there is no doubt, whatever, that there are many instances of failure of concrete that have occurred which might have been prevented by a judicious testing of the materials before use. After a failure is the wrong time to commence to find the cause.—The Contract Record.

Bowser & Company Announce a Piston-Type "Visible" Gasoline Pump

Of five-gallon capacity, this new pump is based on the time-proven principle of piston-type measurement and incorporates the famous Bowser water separating filter which extracts all moisture from the gasoline discharged. It also has several new features for the protection of the public.

A bell announces the completion of each gallon measurement of the piston stroke. Thus the customer can check the measurement without watching the pump.

To prevent any misunderstanding between seller and buyer as to the amount discharged, large dial indicators record each individual sale.

But the most interesting feature of this pump to the customer is a sight glass located in the discharge arm, which permits him to see the gasoline both before and during discharge. Seeing the gasoline through this sight glass before discharge, the purchaser is absolutely assured of accurate measurement. Seeing the gasoline flow through the sight glass into the hose leading to his car, he is again assured that he is getting all of the gasoline discharged by the pump.

This pump is power operated by air pressure on an auxiliary cylinder which makes the power application absolutely safe in connection with gasoline. It is also arranged for hand operation. All driving parts run in oil, assuring long life and easy operation.

While this new pump adheres to the piston-type measuring principle, for which Bowser & Company have always stood, it affords every virtue of "visibility," with no sacrifice of safety, either to buyer or seller, in the handling of gasoline.

These pumps are now on sale in all parts of the United States.

Says Material Has Come Down

A news dispatch from Boise, Idaho, announces that "building can be done cheaper now than at any time since the war." Mr. W. W. Baum of the Baum Construction Company of Salt Lake is the authority quoted.

The prospects for building in Salt Lake are not particularly good, Mr. Baum said, owing to lack of capital for commercial purposes and the fact that many of the manufacturing concerns are not very busy.

The wage scale at present, according to Mr. Baum, is about 40 per cent higher than pre-war prices for expert labor, and 50 per cent higher for common labor. During the war common labor advanced about 100 per cent, he said, and expert labor about 80 per cent.

New Plumbing Firm

The firm of James & Drucker, plumbing and heating contractors, 450 Hayes street, San Francisco, has dissolved partnership, Mr. James retiring. Mr. Herman Lawson has become associated with Mr. Drucker and the business will be continued under the name of Lawson & Drucker at the old address.

To Relocate Yosemite Road

The $12,000,000 project of the Merced Irrigation District, approved by the state bond commission, involves the relocation of the Yosemite Valley Railroad at an estimated cost of $2,043,000. Portions of the present route of the railroad will be inundated by the building of the proposed dam in the Merced river at Exchequer.

Sutter Street Buildings

Messrs. Proctor & Chamberlain are to build two store and loft buildings on Sutter street, San Francisco, one near Stockton and the other at the corner of Mason street. O'Brien Bros. are the architects.

Philadelphia and Reading Freight Station,
Bethlehem, Pa.

WILSON

Standard for Forty-five Years

Rolling Steel Doors

"Underwriters' Label Service"

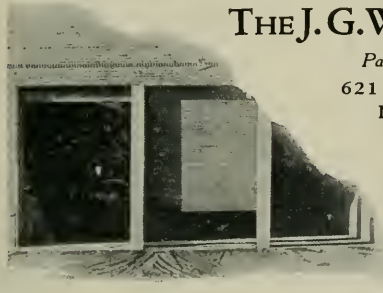
Prices have been reduced more than reduction in material and labor costs of Wilson products—consistent with our policy of forty-five years in giving each Wilson customer the highest quality and service.

Wilson Rolling Steel Doors effect economy in building. Super-strong, durable, fireproof. Easy to install and operate. Overhead and out of way when not in use, saving valuable floor and wall space. Used in industrial plants, mercantile houses, freight and railroad car sheds the country over.

Strength, as well as fine appearance, gained by Wilson design of Slat construction. Shields protect edges of *both* sides of door. Safety anchors permanently secure door in groove, offering maximum pressure resistance for minimum groove depth.

Wilson Rolling Wood Doors used wherever metal rolling doors are not applicable —especially in round houses and chemical plants.

Write for circulars. Wilson details and specification also in Sweet's Catalogue.



THE J. G. WILSON CORPORATION

Pacific Coast Office and Factory

621 NORTH BROADWAY,
LOS ANGELES, CALIF.

WATERHOUSE-WILCOX CO., *San Francisco*
THEO. F. SNYDER, *San Diego*
S. W. R. DALLY, *Seattle*
F. W. FARRINGTON & CO., *Portland*
WALTER DUBREE, *Phoenix*
HAWLEY-RICHARDSON-WILLIAMS CO.,
Salt Lake City

Liquid Carbonic Bldg., Atlanta, Ga., showing Wilson Rolling Wood Doors. *J. J. Nevy, Chicago, Architect*

The ARCHITECT & ENGINEER

MARCH 1922

Published in San Francisco
50 cents a copy - $2.50 a year

A Space-saving Idea

The Pacific Combination Sink and Laundry Tray is a splendid fixture for apartments and bungalows. It provides laundry and kitchen sink facilities in a space 20½ x 48 inches. Its height is adjustable. When not in use the laundry tray may be covered with a drain board.

Also furnished with a porcelain-enameled iron back.

PACIFIC
PLUMBING FIXTURES

For Sale by All Jobbers

Main Offices: 67 New Montgomery Street, San Francisco
Factories: San Pablo and Richmond, California
Branches: Portland and Los Angeles

The Architect and Engineer—MARCH, 1922—Vol. LXVIII, No. 3. Published monthly—$2.50 a year. 627 Foxcroft Building, San Francisco, California. Entered as second-class matter, November 2, 1905, at the Post Office at San Francisco, California, under the act of March 3, 1879.

Architects' Specification Index

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ART METAL
Federal Ornamental Iron and Bronze Co., 16th St. and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Tropico Potteries, Inc., Glendale, Cal.

AUTOMATIC SPRINKLERS
Grinnell Co. of the Pacific, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Company, 72 Natoma street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

AUTOMOBILES
W. L. Hughson Co., Geary St., at Van Ness Ave., San Francisco.

BANKS
First National Bank, Post and Montgomery streets, San Francisco.

BANK FIXTURES AND INTERIORS
Fink & Schindler, 218 13th St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.

BELTING AND PACKING
New York Belting and Packing Company, 519 Mission St., San Francisco.
H. N. Cook Belting Co., 401 Howard St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

BLACKBOARDS
C. F. Weber & Co., 985 Market St., San Francisco, Los Angeles and Reno, Nevada.
Beaver Blackboards and Greenboards, Rucker-Fuller Desk Company, Coast agents. 677 Mission St., San Francisco; also Oakland and Los Angeles.
Steuart Sales Co., 247 Rialto Building, San Francisco.

BLINDS—VENETIAN AND DIFFUSELITE
J. G. Wilson Corporation, Metropolitan Bldg., Los Angeles; Waterhouse-Wilcox, Underwood Bldg., San Francisco.
Western Blind & Screen Co., Long Beach Ave., Los Angeles; C. F. Weber & Co., San Francisco, Los Angeles, and Phoenix, Ariz.

BOILERS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
Kewanee Water Supply System, Simonds Machinery Co., 117 New Montgomery St., San Francisco.

BOOK BINDERS
Abbott-Brady Printing Corp'n, 460 Fourth St., San Francisco.

BONDS FOR CONTRACTORS
American Mutual Liability Insurance Co., Balboa Bldg., San Francisco.
Bonding Company of America, Kohl Bldg., San Francisco.
Bankers & Shippers Insurance Co. of New York, Insurance Exchange Bldg., San Francisco.
Globe Indemnity Co., 444 California St., San Francisco.
Fidelity & Casualty Co. of New York, Balfour Bldg., San Francisco.
National Surety Co. of New York, 105 Montgomery St., San Francisco.
William Healey & Son, 208 Crocker Building, San Francisco.

BRASS GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 635 Mission St., San Francisco.

BRICK, PRESSED, PAVING, ETC.
Richmond Pressed Brick Co., Sharon building, San Francisco. Plant at Richmond, Cal.
United Materials Co., Sharon Bldg., San Francisco.
Cannon & Co., Sacramento; and 77 O'Farrell street, San Francisco.

BRICK & CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
The Paraffine Companies, Inc., 34 First St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.
Wadsworth, Howland & Co., Inc., Boston, Mass., manufacturers of Bay State Brick & Cement Coating. Jas. Hambly & Son, agents, San Francisco and Los Angeles.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn., coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Palace Hardware Company, Agents Corbin goods, 581 Market St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora; Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.

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BUILDING MATERIALS, SUPPLIES, ETC.
- Abeel-Jensen Co., Call Bldg., San Francisco.
- Pacific Materials Co., Underwood Bldg., San Francisco.
- Waterhouse-Wilcox Co., 523 Market St., San Francisco.

BUILDING PAPER
- The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

CABINET MAKERS
- Home Manufacturing Company, 543 Brannan St., San Francisco.
- Fink & Schindler Co., 218 13th St., San Francisco.
- Mullen Manufacturing Company, 64 Rausch St., San Francisco.
- Lannom Bros. Mfg. Co., 5th and Magnolia sts., Oakland.
- Pacific Mfg. Co., San Francisco, Los Angeles and Oakland.

CARPETS
- John Breuner Co., 281 Geary St., San Francisco.
- D. N. & E. Walter, Mission near Second street, San Francisco.
- W. & J. Sloane, 216-228 Sutter street, San Francisco.

CASEMENT WINDOW HARDWARE
- Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

CASTINGS
- Victory Manufacturing Co., Monadnock building, San Francisco.

CEMENT
- Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.
- Medusa White Portland Cement, manufactured by Sandusky Cement Co., represented in San Francisco by Pacific Building Materials Co., Underwood Bldg., San Francisco.
- Old Mission Portland Cement Co., Mills Building, San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
- Armorite, sold by W. P. Fuller & Co., all principal Coast cities.
- Bay State Brick and Cement Coating, manufactured by Wadsworth, Howland Co., Boston, Mass. James Hambly & Son, Distributors, San Francisco and Los Angeles.
- Medusa White Portland Cement, manufactured by Sandusky Cement Co., represented in San Francisco by Pacific Materials Co., 525 Market St., San Francisco.

CEMENT TESTS—CHEMICAL ENGINEERS
- Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CLAY PRODUCTS
- Cannon & Co., Sacramento, Cal.
- Gladding, McBean & Co., Crocker Bldg., San Francisco.
- Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
- Tropico Potteries, Inc., Glendale, Cal.
- United Materials Co., Sharon Bldg., San Francisco.

CLOCKS—ELECTRIC TIME
- Pacific Electric Clock Co., 516 Wells-Fargo Bldg., San Francisco.
- Standard Electric Time Co., 461 Market St., San Francisco.

COLD STORAGE PLANTS
- T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORS
- "Linotol" plastic flooring, Hill, Hubbell & Co., 115 Davis street, San Francisco; 410 San Fernando Bldg., Los Angeles.

CONCRETE CONSTRUCTION
- Barrett & Hilp, 918 Harrison St., San Francisco.
- Clinton Construction Co., 140 Townsend street, San Francisco.
- K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
- P. A. Palmer, Monadnock Bldg., San Francisco.
- I. M. Sommer, 401 Balboa Bldg., San Francisco.
- Steelform Contracting Company, 681 Market St., San Francisco.

CONCRETE OR CEMENT HARDENER
- Gunn, Carle & Co., Inc., 444 Market street, San Francisco.

CONCRETE MIXERS
- Foote and Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
- Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.
- Smith-Booth-Usher Co., San Francisco and Los Angeles.

CONCRETE REINFORCEMENT
- Edw. L. Soule Co., Rialto bldg., San Francisco.
- United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
- Twisted Bars. Sold by Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
- Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
- Judson Mfg. Co., 817-821 Folsom St., San Francisco.
- Pacific Coast Steel Company, Rialto Bldg., San Francisco.
- Triangle Mesh Fabric. Sales agents, Pacific Materials Co., 525 Market St., San Francisco.
- Truscon Steel Co., 527 Tenth St., San Francisco.
- Badt-Falk Co., Call-Post Bldg., San Francisco.

CONDUITS
- Garnett Young & Co., 612 Howard St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL
Barrett & Hilp, 918 Harrison St., San Francisco.
Larsen-Siegrist Co., Inc., 807 Claus Spreckels Bldg., San Francisco.
R. W. Littlefield, 357 12th St., Oakland.
Lawton & Vezey, Call building, San Francisco; Plaza building, Oakland.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
Unit Construction Co., Phelan Bldg., San Francisco.
J. D. Hannah, 142 Sansome St., San Francisco.
John M. Bartlett, 357 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.
Herbert Beckwith, 323 Newton Ave., Oakland.
Collman & Speidel, 546 Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Monson Bros., 251 Kearny street, San Francisco.
Fontanella & Teza, 1682 Eddy Street, San Francisco.
Geo. Wagner, 251 Kearny street, San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.
McLeran & Co., R., Hearst Bldg., San Francisco.
Robert Trost, 26th and Howard Sts., San Francisco.
I. M. Sommer, 401 Balboa Bldg., San Francisco.
S. G. Jackson, 351 12th St., Oakland.
Jas. L. McLaughlin, 251 Kearny street, San Francisco.
Alfred H. Vogt, 185 Stevenson street, San Francisco.

CONTRACTORS' EQUIPMENT
Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Hearst Bldg., San Francisco.
Smith, Booth-Usher Co., 60 Fremont St., San Francisco; 228 Central Ave., Los Angeles.

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CONVENIENCE OUTLETS
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.

CORK TILE
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

CRUSHED ROCK
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

DAMP-PROOFING AND WATERPROOFING
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Bay State Brick & Cement Coating, mfrd. by Wadsworth, Howland Co., Boston. James Hambly & Son, distributors for Northern and Southern California; depots in San Francisco and Los Angeles.
Gunn, Carle & Co., Inc., 444 First street, San Francisco.
Samuel Cabot Co., Boston; represented in San Francisco by Pacific Materials Co., Underwood Bldg.
Hill, Hubbell & Company, 115 Davis St., San Francisco.
"Pabco" Damp-Proofing Compound, sold by the Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

DOOR HANGERS
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Waterhouse-Wilcox Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Oregon.
Stanley Works, New Britain, Conn. Monadnock Bldg., San Francisco.
Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Drinking Faucet Co., 1808 Harmon St. Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 166 7th St., San Francisco.
San Francisco Elevator Company, Inc., 860 Folsom street, San Francisco.

ELECTRICAL CONTRACTORS
Butte Electrical Equipment Company, 530 Folsom St., San Francisco.
Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.
Brown-Langlais Electrical Construction Co., 313 5th street, San Francisco.
Central Electric Company, 185 Stevenson street, San Francisco.
NePage, McKenny Co., 589 Howard St., San Francisco.
Newbery Electrical Co., 359 Sutter street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Globe Electric Works, 1959 Mission St., San Francisco.
M. E. Ryan, Redwood City, and 520 Clunie building, San Francisco.
H. S. Tittle, 766 Folsom St., San Francisco.
Spencer Electric Co., 355 12th street, Oakland.
Spott Electrical Co., Sixteenth and Clay Sts., Oakland.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELECTRICAL SUPPLIES AND EQUIPMENT
- Garnett Young & Co., 612 Howard St., San Francisco.
- Butte Electrical Equipment Co., 530 Folsom St., San Francisco.
- Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard street.
- Safety Electric Company, 56-65 Columbia Square, San Francisco.
- Drendell Electrical & Mfg. Co., 1345 Howard St., San Francisco.
- Western Electric Safety Mfg. Co., Inc., 247 Minna street, San Francisco.

ELEVATORS
- Otis Elevator Company, Stockton and North Point, San Francisco.
- Spencer Elevator Company, 166 7th St., San Francisco.
- San Francisco Elevator Co., 860 Folsom street, San Francisco.

ENGINEERS—CONSULTING, ELECTRICAL, MECHANICAL
- Chas. T. Phillips, Pacific Bldg., San Francisco.
- Hunter & Hudson, Rialto Bldg., San Francisco.

ELEVATOR DOOR HARDWARE
- Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

ESTIMATOR—BUILDINGS AND ENGINEERING WORKS
- Arthur Priddle, 185 Stevenson street, San Francisco.

FAIENCE TILE
- Tropico Potteries, Inc., Glendale, Cal.

FELT—ASPHALT, DEADNING
- The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FENCES—WIRE AND IRON
- Standard Fence Construction Co., 245 Market St., San Francisco, and 316 12th St., Oakland; 320 Los Angeles St., Los Angeles.

FILLING STATION EQUIPMENT
- S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
- Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco, 830 S. Los Angeles St., Los Angeles.

FIRE ESCAPES
- Michel & Pfeiffer Iron Works, 1415 Harrison street, San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Western Iron Works, 141 Beale St., San Francisco.

FIRE-PROOF DOORS
- Forderer Cornice Works, 269 Potrero avenue, San Francisco.
- U. S. Metal Products Co., 330 10th street, San Francisco.
- Fire Protection Products Co., 3117 20th street, San Francisco.

FIRE SPRINKLERS—AUTOMATIC
- Grinnell Company, 453 Mission St., San Francisco.
- Independent Automatic Sprinkler Co., 72 Natoma street, San Francisco.
- Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

FIRE RETARDING PAINT
- The Paraffine Companies, Inc., 34 First St., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
- Home Manufacturing Company, 543 Brannan St., San Francisco.
- The Fink & Schindler Co., 218 13th St., San Francisco.
- Mullen Manufacturing Co., 64 Rausch St., San Francisco.
- C. F. Weber & Co., 985 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

FLOOR TILE
- Mangrum & Otter, 827 Mission St., San Francisco.
- S. & S. Tile Company, San Jose.

FLOOR VARNISH
- Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
- Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
- Standard Varnish Works, Chicago, New York and San Francisco.
- R. N. Nason & Co., San Francisco and Los Angeles.
- The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLOORS—HARDWOOD
- Oak Flooring Manufacturers' Association of the United States, Ashland Block, Chicago, Ill.
- Parrott & Co., 320 California St., San Francisco.
- Strable Hardwood Company, 511 First street, Oakland.

FLOORS—MASTIC—FLOOR COVERING
- Hill, Hubbell & Company, 115 Davis St., San Francisco.
- The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLUMES
- California Corrugated Culvert Co., West Berkeley, Cal.
- Jas. A. Nelson, 517 Sixth St., San Francisco.

FUEL OIL SYSTEMS
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
- Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FURNACES—WARM AIR
Mangrum & Otter, 827 Mission St., San Francisco.
Montague Range and Furnace Co., 826 Mission St., San Francisco.
Pacific Heating Company, Second and Grove streets, Oakland.

FURNITURE—BUILT-IN
Hoosier Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—SCHOOL, CHURCH, OFFICE, HOUSE, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
W. & J. Sloane, 216 Sutter street, San Francisco.

GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast Sale offices, San Francisco, Los Angeles and Seattle, Wash
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

GAS STEAM RADIATORS—FUMELESS, ETC.
Ra-Do Fumeless Gas Radiators, manufactured and sold by Baird-Bailhache Co., 478 Sutter St., San Francisco.

GLASS
American Window Glass Co., represented by L. H. Butcher Co., 862 Mission st., San Francisco.
Cobbledick-Kibbe Glass Co., 175 Jessie St., San Francisco.
Fuller & Goepp, 32 Page St., San Francisco, and Syndicate building, Oakland.
W. P. Fuller & Company, all principal Coast cities.

GRADING, WRECKING, ETC.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco.

GRANITE
California Granite Co., Gen. Contractors' Ass'n, San Francisco.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.

GRAVEL AND SAND
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.
Del Monte White Sand, sold by Del Monte Properties Co., Crocker Bldg., San Francisco.

GYMNASIUM EQUIPMENT
Ellery Arms Co., 583 Market St., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Corbin hardware, sold by Palace Hardware Co., 581 Market St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora, Ill., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Parrott & Co., 320 California St., San Francisco.
Strable Hardwood Company, First street, near Broadway, Oakland.
E. L. Bruce Company, American oak flooring, Memphis, Tenn.

HEATERS—AUTOMATIC, GAS, ELECTRIC
Electric Sales Service Co., mfrs. of Therm-elect Water Heater, West Berkeley.
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.
Ra-Do Fumeless Gas Heater, sold by Baird-Bailhache Company, 478 Sutter St., San Francisco.
Wm. J. Schwerin, Ag't Hulbert Electric Steam Radiator, Rialto Bldg., San Francisco.

HEATING AND VENTILATING CONTRACTOR'S, EQUIPMENT, ETC.
Atlas Heating and Ventilating Company, Inc., Fourth and Freelon streets, San Francisco.
Alex Coleman, 706 Ellis St., San Francisco.
C. A. Dunham Co., Sheldon Building, San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
General Boilers Co., 332 Monadnock Bldg., San Francisco.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Lawson & Drucker, 450 Hayes St., San Francisco.
James A. Nelson, 517 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Mechanical Engineering & Supply Co., 908 7th St., Sacramento.
Scott Company, 243 Minna St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

Griffin Sheet Metal Works, Fresno.
W. H. Picard and F. J. Edwards, 5656 College Ave., Oakland.

HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O'Farrell street, San Francisco.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 553 Mission St, San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

ICE MAKING MACHINERY
Cyclops Iron Works, 837 Folsom St., San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant streets, San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSULATION—CORK
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

INSURANCE BROKERS
William Healey & Son, Crocker Bldg., San Francisco.

INTERIOR DECORATORS
Atherly Bros., 2032 Polk St., San Francisco.
Martin & Frederick, 1374 Sutter St., San Francisco.
John Breuner Co., 281 Geary St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero street, San Francisco.

KITCHEN CABINETS
Hoosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.

LANDSCAPE ARCHITECT
Emerson Knight, 704 Market street, San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING AND PLASTERING
MacGruer & Simpson, 226 Tehama St., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.

LATHING MATERIAL
Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., Tenth St., near Bryant, San Francisco.

LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.
Pacific Gas & Electric Co., Sutter street, San Francisco.

LIGHTING FIXTURES
Thomas Day Company, Mission, near Third street, San Francisco.
Roberts Mfg. Co., 663 Mission St., San Francisco.
Electric Appliance Co., 807 Mission street, San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. & J. Sloane, 216 Sutter street, San Francisco.

LUBRICATING OIL STORAGE TANKS AND PUMPS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
Pacific Manufacturing Company, San Francisco, Oakland, Los Angeles and Santa Clara.
Pope & Talbot, foot of Third St., San Francisco.
Santa Fe Lumber Co., 16 California street, San Francisco.
Sunset Lumber Company, First and Oak Sts., Oakland.

MAGNESITE FLOORING, STUCCO, ETC.
Dorite Mfg. Co., 116 Utah Street, San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

MANTELS—WOOD, TILE, ETC.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Fink & Schindler, 218 12th street, San Francisco.

MANUAL TRAINING EQUIPMENT
Richards-Wilcox Mfg. Co., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Ray Cook Marble Company, foot of Powell street, Oakland.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
Tompkins-Kiel Marble Company, 505 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117 20th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Cornice Works, 269 Potrero avenue, San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218 13th St., San Francisco.
Lannom Bros. Mfg. Co., 5th and Magnolia sts., Oakland.

NOTARY PUBLIC
William Healey & Son, 208 Crocker building, San Francisco.

OFFICE EQUIPMENT
C. F. Weber Co. 985 Market St., San Francisco.
Rucker-Fuller Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
Stewart Sales Co., 247 Rialto Bldg., San Francisco.

OIL BURNERS
Bunting Iron Works, 1215 First Nat. Bank bldg., San Francisco.
Fess System Co., 220 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
T. P. Jarvis Manufacturing Co., 275 Connecticut St., San Francisco.
G. E. Witt Co., 862 Howard St., San Francisco.
W. S. Ray Manufacturing Co., 29 Spear street, San Francisco.
F. L. Warner, 696 20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE.
California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 16th St. and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Palm Iron & Bridge Works, Sacramento.
C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.
Hill, Hubbell & Company, 115 Davis street, San Francisco.
Wadsworth, Howland Co., makers of Bay State Brick and Cement Coating, Boston, Mass.
James Hambly & Son, Distributors in San Francisco and Los Angeles.

PAINTING—SPRAY EQUIPMENT
Pneumatic Painting Machy. Co., 1046 Monadnock Bldg., San Francisco.

PAINTING, TINTING, ETC.
Atherly Bros., 2032 Polk St., San Francisco.
Wayne & Williams, 1621 Eddy St., San Francisco.
I. R. Kissel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
The Tormey Co., 681 Geary St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
A. Quandt & Son. 374 Guerrero street, San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 414-424 Ninth St., San Francisco.
Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco and all principal coast cities.
R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
W. P. Fuller & Co., all principal Coast cities.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PARTITIONS—FOLDING AND ROLLING
J. G. Wilson Corporation, 600 Metropolitan Bldg., Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Francisco.

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS
Victory Manufacturing Co., Monadnock building, San Francisco.

PLASTER
"Arden" brand, A. C. Robertson, Builders Exchange, San Francisco. U. S. Gypsum Co.

PLASTERING CONTRACTORS
A. Knowles, Call building, San Francisco.
MacGruer & Simpson, 266 Tehama street, San Francisco.

PLAYGROUND APPARATUS
A. G. Spalding & Bros., 625 Market St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Thos. Brodie, 2119 Fillmore street, San Francisco.
Gilley-Schmid Company, 198 Otis street, San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College avenue, Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
All-In-One Plumbing Fixture Corporation, 231 Oschner building, Sacramento.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 198 Otis St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

PLUMBING FIXTURES, MATERIALS, ETC. Continued.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 553 Mission St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
Standard Metals Mfg. Co., 1300 N. Main st., Los Angeles; 216 Hobart building, San Francisco.
Victory Mfg. Co., 423 Monadnock Bldg., San Francisco.
West Coast Porcelain Manufacturers, Rialto building, San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.

POLES AND PILING
Santa Fe Lumber Co., 16 California street, San Francisco.

POWER TRANSMITTING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PRELIMINARY ESTIMATES, VALUATIONS
Arthur Priddle, 185 Stevenson street, San Francisco.

PUBLIC QUANTITY SURVEY PLAN
Arthur Priddle, 185 Stevenson street, San Francisco.

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—HAND OR POWER, FOR OIL AND GASOLINE
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS
Arthur Priddle, 185 Stevenson street, San Francisco.

RADIATORS—ELECTRIC STEAM
William J. Schwerin, 217 Rialto Building, San Francisco.

RADIATOR TRAPS
C. A. Dunham Co., Sheldon Bldg., San Francisco.

REINFORCING STEEL
Edward L. Soule, Rialto Building, San Francisco.
Badt-Falk & Co., Call Bldg., San Francisco.
Gunn, Carle & Co., Inc., 444 Market street, San Francisco.
Pacific Coast Steel Co., Rialto Building, San Francisco.
Truscon Steel Co., 527 10th St., San Francisco.

REFRIGERATORS
McCray Refrigerator Company, San Francisco office, 765 Mission street.

ROCK AND GRAVEL
Coast Rock & Gravel Co., Call Bldg., San Francisco.

ROOFING CONTRACTORS
Bender Roofing Company, Monadnock Bldg., San Francisco.
Hill, Hubbell & Co., 115 Davis street, San Francisco, and San Fernando Bldg., Los Angeles.

ROOFING AND ROOFING MATERIALS
"Malthoid" and "Ruberoid," also "Pabco" ten and twenty year roofs, manufactured by the Paraffine Companies, Inc., San Francisco.
United Materials Co., Sharon Bldg., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAND
Coast Rock & Gravel Co., Call Bldg., San Francisco.
Del Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, San Francisco and Los Angeles.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 985 Market St., San Francisco; 512 S. Broadway, Los Angeles.
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.
Stewart Sales Co., 247 Rialto Building, San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The Paraffine Companies, Inc., 34 First St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

SHEET METAL WORK
Forderer Cornice Works, 269 Potrero ave., San Francisco.
Griffin Sheet Metal Works, Fresno, Cal.
Pacific Heating Company, Second and Grove streets, Oakland.
U. S. Metal Products Co., 330 10th street, San Francisco.
Fire Protection Products Co., 3117 20th street, San Francisco.

SHINGLE STAINS
Bass-Hueter Paint Company, all principal Coast cities.
Cabot's Creosote Stains, sold by Pacific Building Materials Co., 525 Market St., San Francicco.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—COMPOSITION, UNIT AND STRIP
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

SINKS—COMPOSITION
Petrium Sanitary Sink Co., Fifth and Page Sts., Berkeley.

STEEL HEATING BOILERS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 444 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Benson & Benson, The Alameda, San Jose.
Judson Mfg. Co., 817-821 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco, and Key Route Fell, Oakland.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Hill, Hubbell & Company, 115 Davis St., San Francisco.

STEEL ROLLING DOORS
Pacific Building Materials Co., Underwood Bldg., San Francisco.
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles Waterhouse-Wilcox Co., San Francisco
Rolph, Mills & Co., San Francisco, Los Angeles, Portland and Seattle.

STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 525 Market St., San Francisco.
"Lupton" steel sash, Waterhouse-Wilcox Co., agts., San Francisco, Los Angeles and San Diego.
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich. Direct factory sales office, Foxcroft Bldg., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS
Zouri Safety Sash Bars—Cobbledick-Kibbe Glass Company, 175 Jessie St., San Francisco.

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SUMP AND BILGE PUMPS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

SWITCHES AND SWITCHBOARDS
Wemco Safety Switch, manufactured and sold by W. E. Mushet Co., 502 Mission St., San Francisco.
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer's Safety Switch Co., 575 Howard Street, San Francisco.
Unit Electric Co., 450-60 Natoma Street, San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market street, San Francisco.
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannon & Co., Sacramento; and 77 O'Farrell St., San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.
United Materials Co., Sharon Bldg., San Francisco.

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los Angeles, Portland and Seattle.

TRAVELING CRANES
Cyclops Iron Works, 837 Folsom St., San Francisco.

VALVES—PIPES AND FITTINGS
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
H. Mueller Mfg. Co., 635 Mission street, San Francisco.
W. E. Mushet Co., 502 Mission St., San Francisco
Victory Manufacturing Co., Monadnock building, San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.
Everlasting Blow-off Valves. General Machinery and Supply Co., 39 Stevenson street, San Francisco.

VARNISHES
Bass-Hueter Paint Company, Mission, near 4th street, San Francisco, and all principal coast cities.
W. P. Fuller Co., all principal Coast cities.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, 55 Stevenson St., San Francisco.

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Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

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West Coast Porcelain Manufacturers, Rialto Building, San Francisco.

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Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

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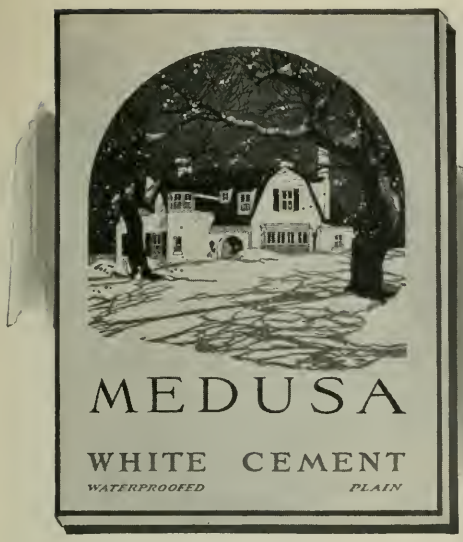

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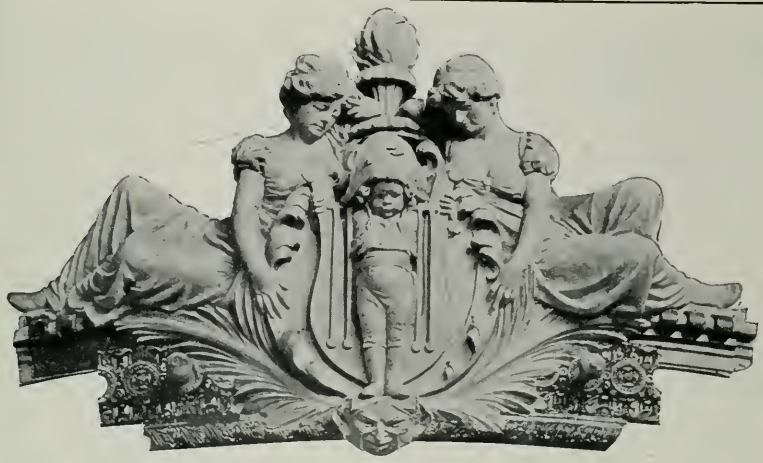

THE ARCHITECT AND ENGINEER

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DINING ROOM, HOUSE OF THE LATE MR. FRANK PIXLEY, PEBBLE BEACH, CAL.

THE
ARCHITECT
AND
ENGINEER

MARCH
1922

Vol. LXVIII
No. 3

Home Interiors

Some Impressions of an Architect

ARCHITECTURAL thinking may be rated in a progressive scale of effectiveness according to the number of architectural elements simultaneously embraced. There are designers with minds of a primitive and rudimentary type which conceive a building as a front facade. The habit of including side facades in the same conception marks a step in advance. Next in order follows the rear facade. And after these, the interiors. This does not mean that side facades are more important than front ones, rear facades than side ones, and so on (although such often happens to be the case after an architect has lavished a solicitous ineptitude on the front). It is rather that a conception is comprehensive in proportion as it neglects fewer of the inter-related elements of a problem. The last thing ordinarily to be considered is the interiors; which is to say that there are relatively few designers equipped to grasp a house as a whole organism.

The conception of interiors themselves proceeds along a line of progression somewhat analogous. There are designers who never get beyond the idea of a room as a series of one, two, three, or four facades. Above that comes a realization of the "solidity," or volume, of a room. And the last in the scale is a feeling for the hangings and furniture.

"Facade designing" is as unsatisfactory a procedure in the designing of a room as of an exterior, but one much more difficult to transcend. There is no lack of designers who appreciate that the effect of a building is something very different from any of its elevational facades, and that its actual convex mass, or bulk, is a quality at once more important and more elusive. The one who appreciates that analogous conditions are met in the concave design of interiors is more of a rarity. In a room displaying any real distinction of design the actual air space enclosed assumes a real mass, or bulk, as it were. No room which fails to possess this quality to some degree can be in any degree satisfying. Yet the ability to control such effects is one of the most unusual to be encountered. One must possess a certain instinctive ability to visualize the effect of drawings in execution;

the most careful consideration of the drawings themselves constitutes but a partial and sometimes illusory guide. This is much more true of interiors than of exteriors; and there are several readily understandable reasons why it should be so. For instance, one looks at a building, when contemplating it as a whole, with all its parts receding and in view; whereas a part of every interior lies behind one and the sides gradually fade away at the edges of the field of vision. This makes a profound difference in the effect of the design, along with the related fact that the spectator is nearer to the objects viewed, and that every movement of the head therefore produces a greater alteration in the subject viewed. Thse same considerations apply

LIVING ROOM, HOUSE OF THE LATE MR. FRANK PIXLEY, PEBBLE BEACH, CAL.

to courts; and it will be noted that, along with thoroughly successful interiors, successful courts of small or moderate dimensions are more rare than good exteriors.

The one consideration which places the open court in the exterior class, and makes its effect more readily calculable than that of the interior, is the analogous out-door lighting. Lighting, in fact, is one of the most elusive elements affecting interior design. Exterior lighting—day lighting, at least—is uniform in character within fairly narrow limits, and hence comparitively easy to visualize. But light may be introduced into a room in a variety of fashions, whose effects will be widely different; and, without considerable experience and above all a truly imaginative vision, difficult to foresee. The above mentioned effect of reality of the volume of a room is to a large degree the result of successful lighting, that is to say, the correct

amount of light introduced at the right points. One of the gravest faults of our contemporary ordinary domestic interiors, one particularly responsible for their prevalent lack of distinction and dignity, is the lowness of window heads. A transom over a window, introducing the light at a higher level, will frequently make an enormous difference in the aspect of a room. Clerestory lighting is a motive of great beauty, almost completely neglected in contemporary residence work, even where possible under the conditions of plan and section.

The last element of interior design entertained by the average designer —an element all too frequently entirely overlooked—is the furnishing. Yet

LIBRARY, HOUSE OF THE LATE MR. FRANK PIXLEY, PEBBLE BEACH, CAL.

it is a commonplace of experience that one and the same architectural setting may be made or ruined by the furnishing alone. As a matter of fact, the design of a room can not be intelligently conceived except in view of what is to go into it. To appreciate this truth one has but to imagine the dining room of the Cook house, illustrated on page 50, furnished with the lavish Oriental splendor of the Pixley house (frontispiece and pages 48 and 49); or the elaborate wood architecture of the Pixley house treated with the calculated austerity of the rooms which Mr. Hobart has planned for the Cravens house (page 53). Such incongruities would be grotesque to any sensitive person; and the idea serves to emphasize the actually existing harmony which pervades these rooms, from their fixed to their smallest movable parts. Yet such misfits, in principle, are occurring daily in houses built by supposedly sensitive architects. I. F. M.

DINING ROOM, HOUSE FOR MR. GEORGE T. COOK, PEBBLE BEACH, CAL. PIERPONT & WALTER S. DAVIS, ARCHITECTS

LIVING ROOM, HOUSE FOR MR. GEORGE T. COOK, PEBBLE BEACH, CAL. PIERPONT & WALTER S. DAVIS, ARCHITECTS

DINING ROOM

LIVING ROOM, HOUSE FOR MR. E. H. COX, PEBBLE BEACH, CAL.
Chas. F. Cobbledick, Architect

LIVING ROOM, HOUSE FOR MR. E. H. COX, PEBBLE BEACH, CAL.
Chas. F. Cobbledick, Architect

LIVING ROOM, HOUSE FOR MR. JOHN S. CRAVENS, PEBBLE BEACH, CAL.
Lewis P. Hobart, Architect

BED ROOM

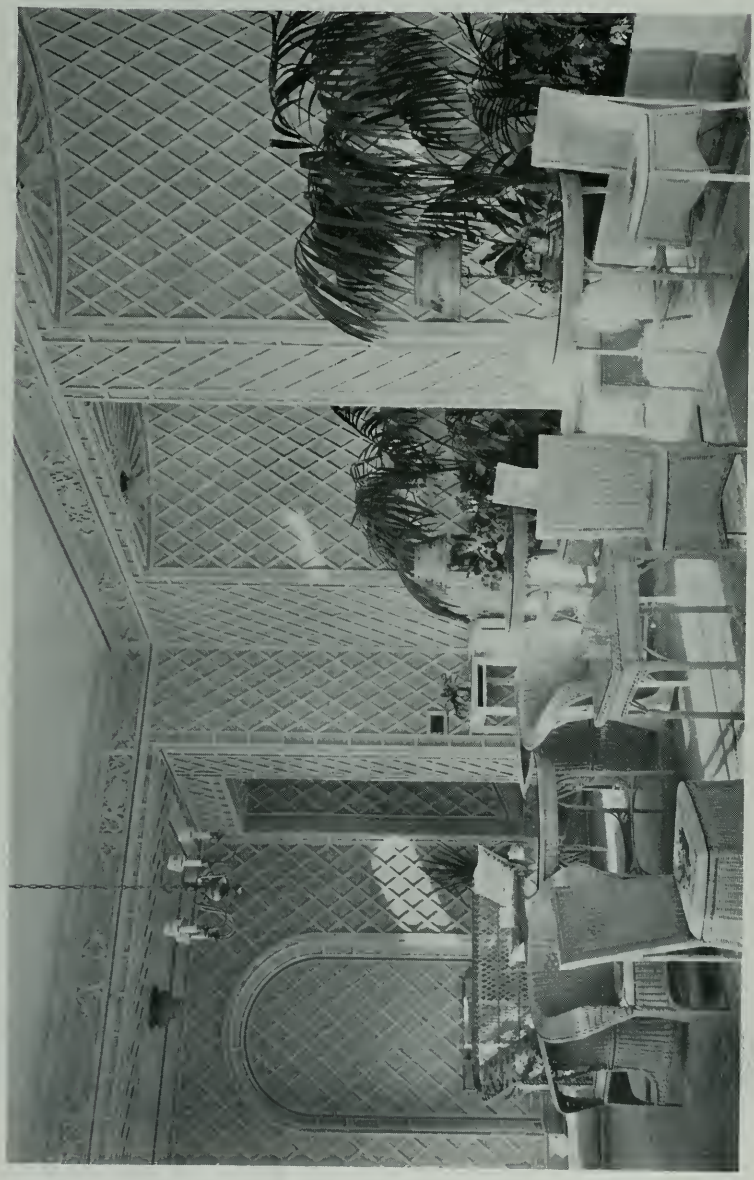
BED ROOM, HOUSE FOR MR. JOHN S. CRAVENS, PEBBLE BEACH, CAL.
Lewis P. Hobart, Architect

LIVING ROOM

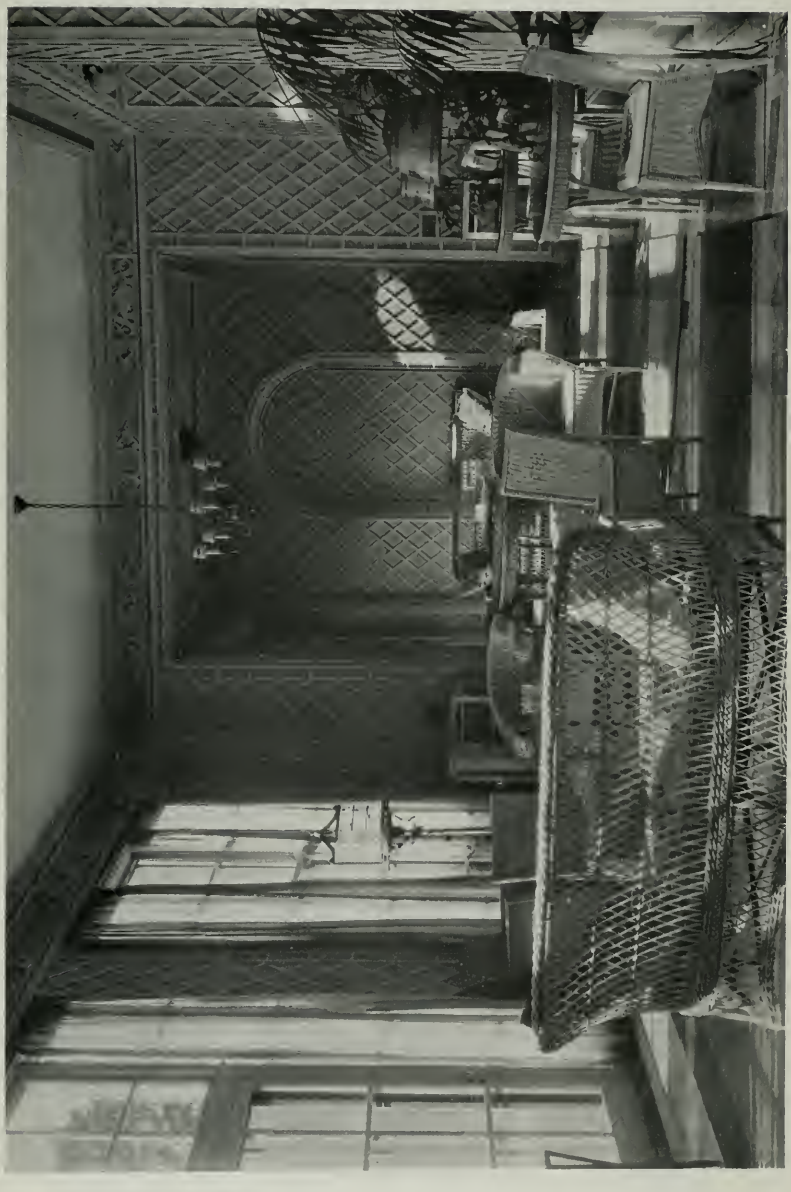
DINING ROOM, HOUSE FOR MR. CHARLES F. DILLMAN, PEBBLE BEACH, CAL.
Lewis P. Hobart, Architect

LIVING ROOM, HOUSE FOR MR. S. W. FORSMAN, PEBBLE BEACH, CAL. S. W. FORSMAN, ARCHITECT

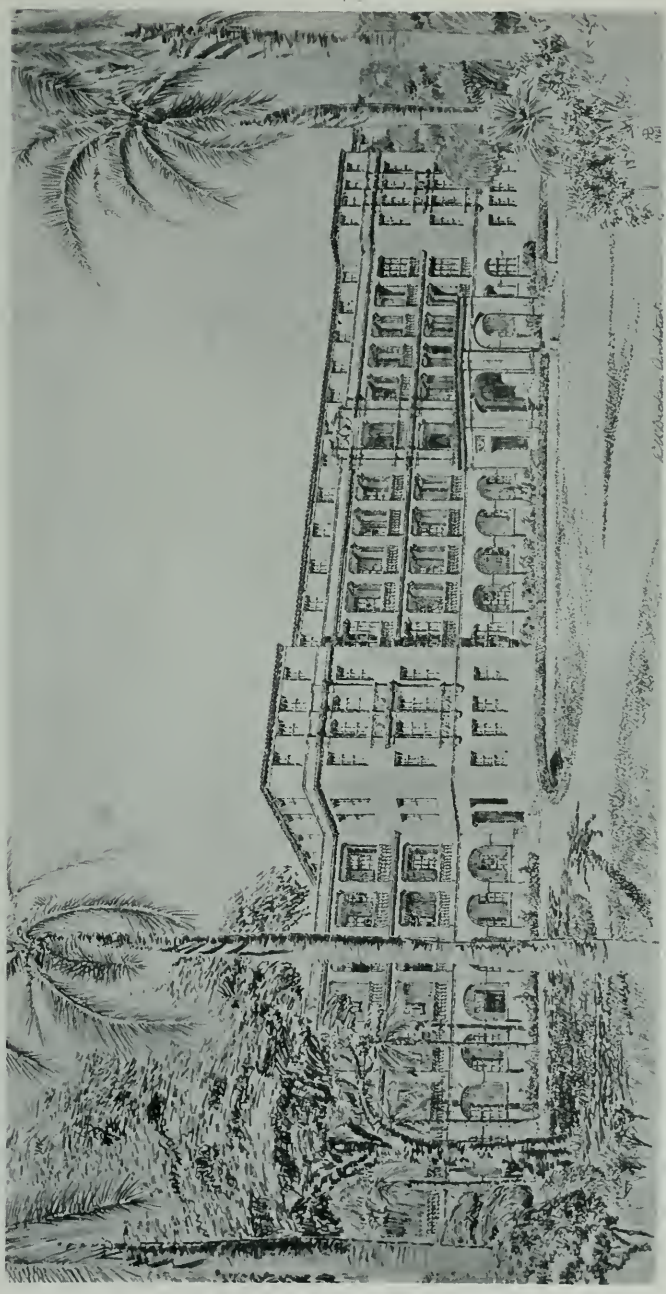
DINING ROOM FIREPLACE, HOUSE FOR MR. A. K. MACOMBER, PEBBLE BEACH, CAL. LEWIS P. HOBART, ARCHITECT



TEA ROOM, DEL MONTE LODGE, PEBBLE BEACH, CAL.
LEWIS P. HOBART, ARCHITECT



TEA ROOM, DEL MONTE LODGE, PEBBLE BEACH, CAL.
LEWIS P. HOBART, ARCHITECT



QUEEN'S HOSPITAL, HONOLULU, HAWAII.
C. W. DICKEY, ARCHITECT

Office Building and Hospital

SOME of the recent work of Mr. C. W. Dickey of Oakland is shown in the accompanying perspectives and studies of an office building for the Pacific Gas & Electric Company, Oakland, and a large hospital in Honolulu for the Queen's Hospital Association.

The design for the new Queen's hospital is a simple and dignified interpretation of the Spanish Renaissance style of architecture, with broad lanais suitable to the Honolulu climate. Bright colored awnings will be used as an important feature of the design. They will be hand painted and treated by a fireproofing process. A raised terrace across the front of the main building will give it a fine setting and at the same time afford an easy approach for automobiles and ambulances. The main entrance is through a central porte cocher with auxiliary entrances at the ends of the new building which will be 220 feet long and four stories high. The old wooden porches are to be removed from the present Pauahi wing and replaced with reinforced concrete porches in keeping with the new building.

The exterior will be finished in light colored cement stucco with touches of red tile on the tops of the walls. The sashes and iron railings will be finished in dull green.

The plans for the new building have been worked out by the architect, Mr. C. W. Dickey, collaborating with Dr. R. G. Brodrick, one of the best hospital experts in the United States. Dr. Brodrick's method of planning is different from most experts. He places himself in the position of the occupants of the building and in imagination actually lives every operation and arranges the rooms and the conveniences to give the maximum efficiency and economy. No detail of arrangement or construction is too small for his careful consideration. The result will doubtless be a hospital of which all Honolulu may well be proud.

Among the general features of the hospital that will make it strictly modern are the following: All cases, refrigerators, etc., will be built in flush with the walls. Floors in general will be of cement covered with light grey linoleum, special floors such as operating rooms, baths, toilets, utility, treatment, and other rooms where water is used, being of tile. In the operating room the floor and walls to a height of five feet will be of light grey tile. The door frames, casings and much of the trim will be of enamelled steel. The doors will be of birch stained to a dark mahogany color and built of glass in the upper half. Double acting doors will be fitted with cork kick-plates let in flush with the surface of the door. A projecting, rounded base will be provided in all rooms to keep the furniture away from the walls. The walls in general will be of painted hard wall plaster.

There will be a ventilating system to exhaust the air from operating rooms, utility rooms, toilets, diet kitchens, and other places where odors originate.

* * *

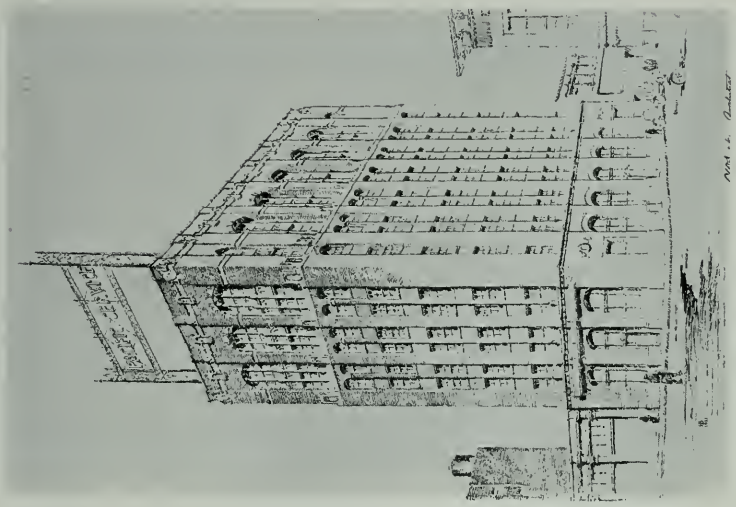
The new office building for the Pacific Gas & Electric Company to be erected at the southwest corner of Seventeenth and Clay streets, Oakland, opposite the American Theater, will be an imposing structure. It will be a strictly fireproof high class office building with granite base and walls of flame colored brick and terra cotta and will be occupied in its entirety by the Pacific Gas & Electric Company.

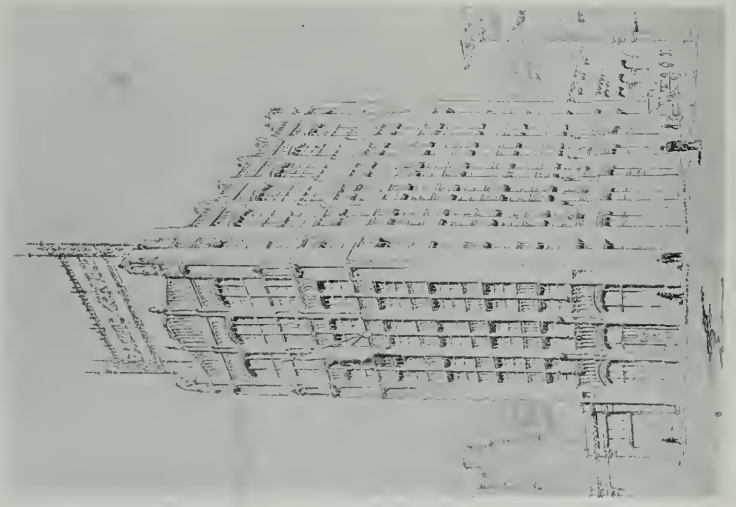
The first story windows and doors will be of copper. At night a most unique and original lighting effect will be seen which has been devised by Mr. Romaine Myers, electrical engineer, and will consist of a series of sunbursts over the arched openings in the eighth story. These are produced by special refractors mounted in the terra cotta medallions.

ETHEL MOORE MEMORIAL, CHILDREN'S BUILDING, OAKLAND, CAL. CONSTRUCTION DEPARTMENT, OAKLAND PUBLIC SCHOOLS.
Marston Campbell, Chief of Construction; C. W. Dickey, Supervising Architect.

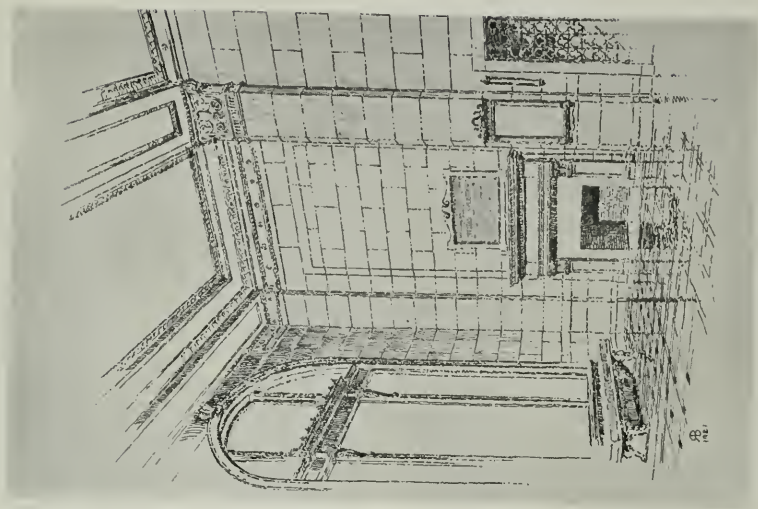
ETHEL MOORE MEMORIAL, CHILDREN'S BUILDING, OAKLAND, CAL. CONSTRUCTION DEPARTMENT, OAKLAND PUBLIC SCHOOLS.
Marston Campbell, Chief of Construction; C. W. Dickey, Supervising Architect.

ACCEPTED DESIGN, BUILDING FOR PACIFIC GAS AND ELECTRIC COMPANY, OAKLAND, CAL. C. W. DICKEY, ARCHITECT; T. RONNEBERG, ENGINEER

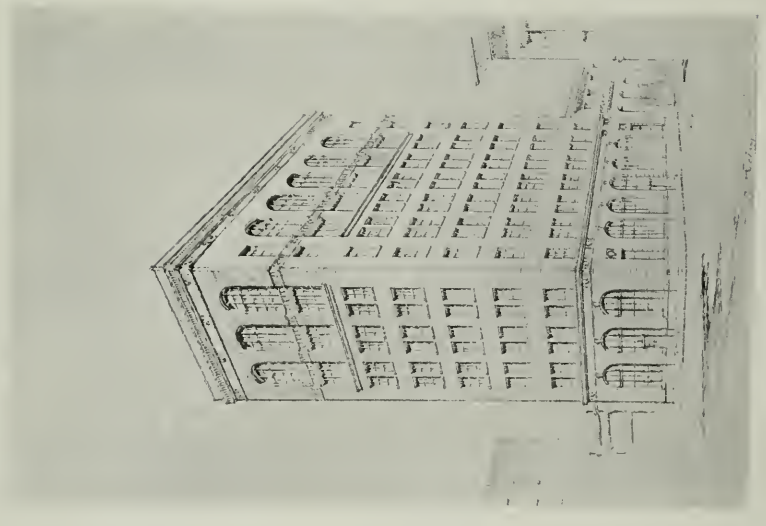




STUDIES FOR BUILDING FOR PACIFIC GAS AND ELECTRIC COMPANY,
OAKLAND, CAL.
C. W. DICKEY, ARCHITECT



VESTIBULE, BUILDING FOR PACIFIC GAS AND ELECTRIC COMPANY, OAKLAND, CAL.
C. W. Dickey, Architect



STUDY FOR BUILDING FOR PACIFIC GAS AND ELECTRIC COMPANY, OAKLAND, CAL.

A Home Without Walls

"A spacious and unique house, without any walls or doors," is described in Popular Mechanics, which says:

This wall-less house is no makeshift dwelling, but substantially and artistically built according to the special design of the mother of the large family, who felt that all concerned would live more natural and healthful lives if unprotected by walls and artificial heat. The home consists essentially of a long concrete floor protected by a roof of corresponding shape and size, supported by Corinthian pillars of concrete, nearly 18 feet high. The roof is shaped like a turtleback and is pierced by two large circular skylights, set with transparent glass. These lights are particularly useful when rain or wind requires the letting down of canvas curtains on one or more sides of the house.

The floor is of concrete, laid over a network of hollow tile which lies only a short distance below the surface. This hollow tile is connected to a hot-air furnace located in a basement occupying a portion of the area beneath the house. The passage of air through the hollow tile serves to keep the floor warm, and so supplies heat.

The home is, in effect, one large veranda. While there are no partitions, there has been constructed at one side, midway between the ends, a series of booths or recesses, two tiers high, with openings at the front, across which hang heavy curtains. These are the dressing rooms for the entire family, and here are dressors, mirrors, and other necessary conveniences for making one's toilet. Only one of these compartments has four walls and a door. This is the bathroom. Stairs lead to the second tier of dressing rooms, along the front of which runs a picturesque balcony. The entire family sleeps on divans or couches, which constitute the principal articles of furniture at one end of the home, which end, in the daytime, might be compared to the reception hall or living room.

A large high backed settee at the opposite end of the house is another important piece of furnishing. The back of this settee is divided into spacious cupboards, where dishes and a small electric stove are to be found. The end of the structure comprising the dressing rooms, next to the settee, is fixed with sinks, and they, together with the cupboards, just referred to, constitute all there is of a kitchen.

A crude fireplace has been dug out in the rocky side of the hill, only a few feet from the end of the wall-less house, and here, amid the shelter of tall trees and shrubery, the family often gather on cool evenings. Another retreat, popular with all the family, is a cave in the hillside, protected by a heavy door, where the family library and those articles which need protection from the weather are housed. All furniture used is finished to withstand a degree of exposure.

Editor's Note:—The house in question was designed by a San Francisco architect, whose supervision stopped after the colonade was completed. The plans were then so altered that architecturally it is considered a sorry mess, and occasionally termed "The Doughnut House." It is located in the Berkeley Hills.

* * *

How to Make Men Work

IF there is any man in the country who has demonstrated his ability to get men to work better than Charles M. Schwab we have yet to hear his name. Mr. Schwab's secret is a very simple one. He packs it all into this paragraph:

"In my wide association in life, meeting with many and great men of various parts of the world, I have yet to find the man, however great or exalted his station, who did not do better work and put forth greater effort under a spirit of approvel than he would ever do under a spirit of criticism."

* * *

Delegates to National Convention

The next Institute convention will be held in Chicago, probably early in May. There will be no exhibition held in connection with it. The delegate representation will be as follows: A basic rate of two delegates for every Chapter plus one for every twenty members or fraction over fifteen.

The Knickerbocker Theater Disaster

By ROSS WILTON EDMINSON, Architect*
Photographs by the Author

MAIN ENTRANCE, KNICKERBOCKER THEATER ON 18TH ST., N.W., WASHINGTON, D. C.

DISASTERS of one kind or another are continually creeping into our lives, for they seem to surround us at all times, and have to some extent become recognized as common occurrences. Mercifully, through all these inevitable calamities there seems to be an unseen God who gives a warning in one way or another to those whose lives are endangered, and, happily, most escape. The precious two or three seconds of the whining sound of shells tells of danger, and enables the soldier to drop to earth, or the smell of smoke in a house heralds a fire before it is too late to get out; even the deadly rattler gives warning before it strikes. These are truly forerunners of great perils.

But when the concrete roof of one of the most popular theaters in Washington, D. C., collapsed without warning upon a pleasure-seeking audience from a seemingly cause of only an unusual snowfall, people stood aghast at the catastrophe, and exclaimed:

"How did the roof fall? Why did it collapse? It is only a new theater," and so on.

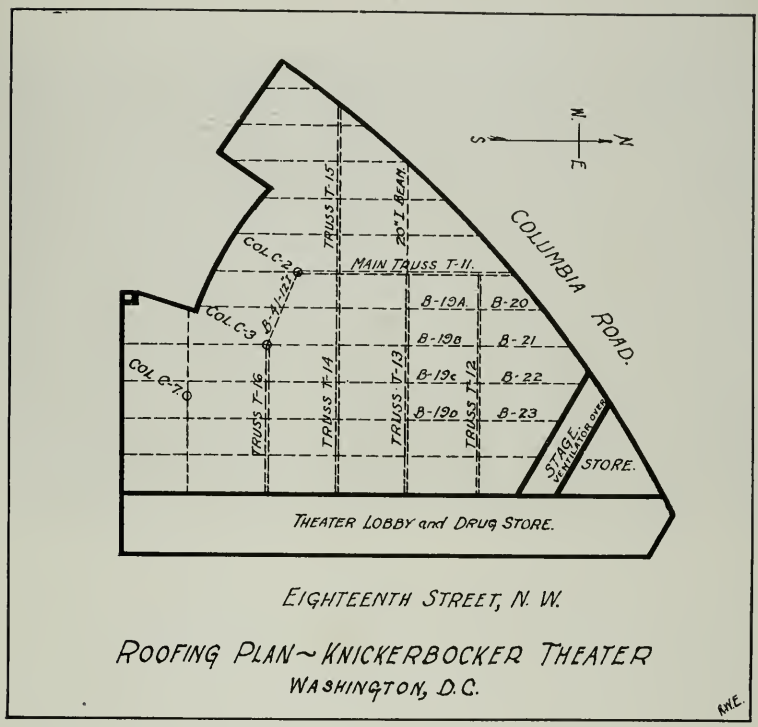
Phrases such as these greeted the ear of the writer as he, too, stood in front of the doomed theater on Saturday night, January 28, only an hour or two after the calamity, and wondered why it fell.

The plan of the Knickerbocker Theater shows a curved wall or the west wall about a hundred and fifty feet long on Columbia road, which intersects the Eighteenth-street wall obliquely. The main entrance is on Eighteenth street N. W., and one is ushered into a well-appointed corridor or lobby. Between the lobby and theater proper, and parallel to the Eighteenth-street wall, is a long wall extending to the roof. We shall for brevity call this the east wall. The stage is near the intersection of the Columbia road and Eighteenth street walls, and the balcony at the south wall. Encompassed within these four walls is the reinforced concrete roof, and supported by a main Truss T-11, which is about fifty-seven feet long, together with three other trusses fifty-five feet long, two trusses about forty feet in length, and secondary beams, all relying on two columns indirectly for support. Truss T-11 is carried by the west wall and the main Column C-2. The east wall carried three trusses, T-12, T-13 and T-14, each fifty-five feet long, and their western support being Truss T-11. Another truss parallel to Truss T-12 rested in this

*Mr. Edminson was formerly a practicing architect in San Francisco. His report on the Washington theater disaster was written especially for this magazine.

Truss T-12 up against the 18th St. wall. Note ventilating fan at left, which was carried down by collapse of the concrete roof.

The much discussed column C-2, showing that part above the joint whose upper end rests on the floor. The greatest strain fell upon this column.



same wall, and extended to the smaller of the two columns, Column C-3. Columns C-2 and C-3 were joined by a twelve-inch "I" beam B-41 twenty feet in length at the level of the roof. From Truss T-11, extending in a westerly direction, and normal to it, was a forty-foot truss which rested in the west wall. It is a lamentable fact that there were no principal ties from Column C-2 south or west, and none to the west of Column C-3. Such was the condition of the trusses and beams carrying the reinforced concrete roof.

Many theories have been advanced as to the cause of the collapse. Among these might be stated that of the Columbia road wall becoming separated from its adjoining walls, permitting the bearing points of beams to loosen, and in particular that of the plate under Beam B-21, for, when Beam B-21 fell it caused Truss T-12 to become unseated, which also upset Truss T-11. The main Column C-2 was found to be not plumb, or if it was plumb when erected it became tilted when Truss T-11 was bolted to it. Another surmised and very probable statement is the weakness of the concrete slab; being too light to carry the loads, especially at the inflection points. The trusses and columns lacked that prime requisite in engineering practice to provide gusset plates and stiffeners where needed. Last, but not to be overlooked, were the vibrations caused by heavy trucking, and numerous street cars both on Columbia road and Eighteenth street N. W.

Intersection of Columbia Road wall and south wall. On the left, column C-2 and that part above the joint broken off. Here is an excellent presentation of what came down on the heads of the spectators. The concrete roof is only three inches thick.

Showing truss T-12 against the 18th Street wall. Note terra cotta above ceiling line upon which truss rested.

No one seems to know just when the cracks occurred in the west wall, one at the junction of this wall with the proscenium wall, the other at the intersection with the south wall, together with a few noticeable ones in the curved wall itself. It is certain that if any occurred prior to the collapse they would have been seen and reported, save those which had their origin between the ceiling and the roof, a distance of about six feet. It is now probable that the cracks were made at the time the roof fell, which, with its great weight and formidable shock, forced the wall out of plumb, leaving a gap of two inches at the proscenium wall, and five inches out of line at the top of the wall. This wall was also further weakened by the fact that no tie iron existed at the intersections.

With reference to the columns, especially Column C-2, much might be said. Column C-3 extended up to and through the ceiling to the roof. Column C-2, unlike Column C-3, only extended to the ceiling line where Truss T-11 had its southern end supported. From the bottom chord of Truss T-11 directly over Column C-2 were two three-inch by four-inch angle iron struts about six feet long, and supporting two or three roof beams.

As before mentioned, Column C-2 was out of plumb, and this has been verified at the ruins. It was noticed that the plaster on the north side at the top is two inches thick, and half an inch at the balcony level, whereas it is the reverse on the side opposite. This was more than likely done with a plumb by the plasterer to give it the appearance of being vertical. Moreover, the columns were not continuous, but were jointed at the balcony, and with regard to Column C-2, which carried the greater part of the roof load, the joint was poorly made. Here the effect of the tilt was plainly seen in the joint, tight and snug on the south side, and leaving a wide gap on the other side. It is without exaggeration to say that these two long and attenuated eight-inch "H" section columns nearly forty feet high supported about two-thirds of the roof's dead load, or seventy-five to eighty tons dead weight, not including the snow load. This extra loading presumably increased the weight twenty pounds per square foot, or even more, during the recent storm.

The concrete roof, from specimens picked up, has been found to vary in thickness from two and a half inches to three and a half inches. Within these limits the meshing was placed to reinforce the concrete. In order to pour this roof the trusses and beams were floored over directly upon the upper flanges of the supporting compression members, and the meshing, consisting of three-sixteenth inch and eighth-inch wires, presumably made secure about three-eights of an inch from the boards. The three-sixteenths inch wires were spaced three inches apart and normal to the east wall, while parallel to this wall were eight-inch wires twelve inches apart and welded to the others. In mechanics of materials we know that the stress is directly proportional to its distance from the neutral axis, an imaginary line running through the center of a homogeneous concrete slab or other material, and it is advantageous to have the reinforcing mesh as far below this axis as possible. Yet there also must be a goodly coating of concrete below the mesh for protection. However, it has been shown through poor workmanship that this meshing was carelessly laid and no regard shown in the pouring of the green concrete over it, thereby instead of having the mesh at three-eights of an inch from the boards it was even up as high as the neutral axis—a plane of no stress.

Other forces than those mentioned played upon this slab, and which were not taken care of, namely, the tensional forces above the neutral axis near the trusses and beams, which were about ten feet apart. Where the mesh is in tension below the neutral axis midway between supports it becomes in compression as it nears the trusses and beams, and changes at the inflection points. No counter-reinforcing mesh was inserted over the trusses and beams to take care of these opposite forces. This, to my mind, was one of the weak points of the roof, especially if the concrete at this place happened to be two and a half inches thick.

As this heavy roof was laid directly on top of the upper flange, or for simplicity, a single compression member, it brought to bear other forces not taken care of in the truss itself. That is, as an example, between the panel points of this upper member a large force was acting tending to throw this part in tension in order to hold the roof in its place. If the upper chord was designed to take its own compressional forces together with the tensional forces set up by the weight of the concrete it would have been well and good, but such was not the case.

If, however, steel purlins designed to carry the weight of the reinforced concrete were placed at the panel points of the trusses, the weight would have been placed where it could be taken care of. Such was also not the case.

Another serious fault with the construction of the roof was at the walls. The mesh was laid directly on top of the terra-cotta wall with no ties, and its bearing on this wall was but three inches. We can then well judge that this had an ill effect upon the wall through continual expansion and contraction. Furthermore, directly at the intersection of the west and north walls the same method of placing the concrete was followed. Here was a very weak spot; between Beams B-21 and B-22, increased perceptibly by the fact that the reinforcing came to both walls on the slant. To make matters worse, this place fostered a calm where the snow greatly increased the danger of rupture due to no bond between wall or roof.

Throughout this network of trusses, beams, and columns, no gusset plates were used to strengthen the structure as a unit. Bolts were used, where in such an important structure as this field driven rivets should have been insisted upon. Not only were bolts used, but in number there were less of them than the required number of field rivets, whereas there should have been a greater number of bolts to insur a sound job. For instance, Beams B-19c and B-22 were bolted to Truss T-12 with two through bolts on each side of beam. Another instance existed at Column C-3, where Beam B-41 was bolted to it. Beam B-41 rested on and was bolted to the top flange of a twelve-inch channel. The lower flange of this channel rested upon and was bolted to an off-set in Column C-3. No through bolts were in the web of the channel to bind it to the column, and as B-41 pulled away from its bearing here there were no plates to hold it in place.

The ceiling of the theater was suspended by iron straps from the roof beams, trusses, and also at various points along the center line of the reinforced concrete roofing which, of course, greatly weakened this already overtaxed slab. Not only this, but to gain an anchorage for the straps the concrete was cut away from the meshing to secure the straps to it.

"Did Column C-2 give way first, or that of the roof slab at the intersection of the west and north walls?" This seems to be the debated

question. Both are logical places of rupture. However, if the slab gave way first, the column, due to its extreme length and weakness, followed almost immediately, and snapped at the joint. As it fell toward the south, there being no tie on this side to hold it in place, it jerked the main truss from its bearing on the west wall.

As the larger of the two columns fell it threw the smaller one out of balance. Beam B-41 attached to it, caused Truss T-16 to be dislodged from the east wall, and in collapsing the roof was also forced towards the south. The balcony being suspended from the trusses and beams, fell at the moment of collapse, aided by the roof, which sheared the balcony from its east abutment. The fall was quicker than the eye could follow, and those who went there for pleasure found themselves in the grip of the worst calamity in many a day. There was no warning, for it was even worse than the Iroquois Theater fire of nearly twenty years ago.

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What An Ounce of Gold Buys in Labor

One ounce of gold buys 17.22 hours of labor in the United States, 50.16 hours in Great Britain, 95.50 hours in Japan, 117.31 hours in France, and 201.66 hours in Germany. These figures were given recently by Mr. C. J. Hannon, member of the British Parliament, quoting statistics before the National Union of Manufacturers in Birmingham.

The figures are interesting for purposes of comparison, especially by the worker in the United States. He must know that he comes, indirectly at least, into competition with the workers in the countries named, and that those countries are competitors of the United States in the world's markets. It should not be difficult for him to realize that if we are to meet that competition successfully, and thus to his own advantage, we must in some way make our ounce of gold paid for 17.22 hours of his labor equal the ounce of gold paid for the much greater number of hours of labor in the countries named.

Our worker does not wish to give more hours for the ounce, and we are not saying that he should do so. Then he must give something that will be a practical equivalent of more hours until the total of return from our ounce equals the total of return from the foreign paid ounce.

He can make his hours more productive. He can become more efficient. He can co-operate more effectually not only with his fellow workers, but with his employers. We do not know of any other way in which we can make our ounce of gold equal in labor return with the ounce that will give us our greatest competition, and we must equal this if we are to sell our goods in the only market that offers an outlet for our surplusses.

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Home Furnishing an Art

"HOME furnishing is an art and a science and not a matter of feeling or taste, though both are employed," says an excellent little booklet recently sent out by a well known furniture manufacturing concern. "It is the combined effort of all the arts requiring years of study, research and serious thought. Objects of beauty and artistic merit, well arranged, are of the greatest influence for good that can be exerted over all people, especially children."

ARCHITECTURE *and the* CHURCH

THE BROADWAY TABERNACLE
NEW YORK CITY
BARNEY & CHAPMAN
Architects

FROM the ancient days of the temple builders, and on through the Christian era, architecture has expressed the highest aspirations of the Church. And, through the Church, architecture has been canonized as the greatest of the arts, for the Church has always offered to the architect his finest opportunities.

The great Church builders of the middle ages had at their disposal unlimited time, and the resources of artist-artisans who spent lifetimes upon the intricate carving of details.

The architect of today, confronted by the complex requirements and limitations of time and labor available for his work, turns to the material which is most available, most adaptable, and expressive of the full character of his envisioned building.

For virtually all his problems the architect of today finds a stimulating and practical answer in Terra Cotta.

In the advertising pages of The Literary Digest, National Terra Cotta Society is telling the reading public something about the responsibilities and achievements of the architect, and something, too, about the advantages of Terra Cotta. These Literary Digest advertisements have attracted unusually wide attention, and progressive architects are keenly following them.

NATIONAL TERRA COTTA SOCIETY is a bureau of service and information. Its publications cover not only the technical and structural use of the material but show, as well, examples of its application to buildings of various types.

Brochures of specific value, as indicated by their titles, will be sent to architects on request addressed to National Terra Cotta Society, 1 Madison Avenue, New York, N. Y.

The School The Theatre The Garage
The Store The Bank

These brochures consist of a selection of illustrations, with text and comment, showing Terra Cotta buildings of the respective types.

Terra Cotta—Standard Construction

A valuable Technical Reference Work for Architects and Engineers.

Terra Cotta Defined

This new booklet, primarily intended to inform the layman, will nevertheless prove interesting to architects who like to review buildings the country over.

One of a series of strong advertisements of pronounced comulative value, which conveys at a glance the thought of architectural possibilities in a church of the first rank through use of the medium advertised. The illustration is from a drawing by an artist of recognized worth in architectural circles. Had the drawing been poor the inference would be one of ignorance in possible artistic collaboration by the manufacturer.

Making the Architect Say "Use It"

By F. S. LAWRENCE*

SOME months ago I received from the head of a well known architect's office a statement of concrete fact about architects and salesmen. This was in the form of actual data from a representative architectural office showing how many calls per day were received from material men desiring to introduce or solicit use of their products and just what it all amounted to in influencing the architect's action.

The answer was illuminating.

He stated that he had kept a careful record and that the result of a year's tabulation indicated an average of thirty such calls per working day, or from eight to nine thousand per year, with a consumption of his time averaging three hours daily. He added that he made it a point to see every caller who had anything new to present, with the view that nothing might escape the knowledge of the office in the way of new or valuable developments in materials and equipment. This allowance of time was considered a paying investment as it yielded many resources for better results in the work that might otherwise have escaped knowledge. "But," he added, "I give you my word that as for the impressions conveyed by the line of talk put up, I could count upon the fingers of one hand the men whose presentation of their subject carried any weight and left me with any desire to see them again. If we wanted further information, we preferred getting at it in some other way than by calling salesmen back again for further consultation, if this could be avoided."

This statement is significant because it preceeded from an office willing daily to set apart two or three hours of an expensive man's time to keep itself in receptive touch with the material market.

Now what is the factor which bulks chiefly in this problem with the architect?

The answer to this lies in the one point which distinguishes the psychology of the architect from that of the average lay customer.

However successful the architect may be in the direction and control of the practical business operations associated with his work, his very choice of architecture as a profession shows him to be, at heart, one whose primary interest inclines toward activity in the terms of business or industrial activity. He is at bottom an artist who wants to think and act as an artist should, but who is forced by the manifold requirements of his profession to think and act as a business man should.

Although this fact is generally appreciated, yet there is no very prevalent effort to select salesmen with the particular aptitude for meeting this psychological factor. Let it be said at once that there is nothing mysterious or occult in the problem. It is simply that the architect's primary interest lying in the sphere of aesthetics, an intelligent comprehension of the mental processes which attend the production of results therein is essential to that rapport between architect and manufacturer which constitutes a fruitful working basis.

It is surprising that so many executives fail to distinguish this necessity in their selection of men for contact work with the architectural profession. Men splendidly equipped for presenting the merits of a product or service to the average man of business and "putting it over" with him against all opposition, are sent against the architect ("against" is quite the right word)

*Executive Secretary, National Terra Cotta Society, in Advertising and Selling.

and expected to accomplish with him an equal success by the same qualities of personal make-up and persuasive method.

The result generally is to arouse that subconscious resistance which every artist will exhibit if he senses an attempt to force his mental processes in the solution of his problem. It makes no difference whether this proceeds from an unintelligent view upon the salesman's part of the architect's particular problem, through his deficiency of education or taste, or is excerted deliberately under an adequate educational equipment in this direction. With the lay customer who, like the manager is apt to be a direct-thinking, hard-hitting business man, the persistent aggressive spirit which evinces the salesman's determination to "put it over" is, if it be done courteously, apt to arouse a sympathetic disposition through recognition of the very qualities to which the business man owes his own success. With the architect we are dealing with quite a different psychological factor—the groping of a fundamental artistic instinct for terms of expression in something that is to be a work of creative art peculiarly and personally his, and he will not view tolerantly any attempt to force the processes of reasoning which affect any part of it, from sand or gravel to gold leaf or fresco. (Possibly he has enough agony of spirit in this direction with the average client.)

A highly gratifying experience of some fifteen years in selling the architect, however, prior to the war (which I do not believe has changed his psychology) convinces me that with all his admittedly human failings he is a pretty reasonable fellow and responsive to a marked degree when rightly approached. It goes without saying that educational fitness for the intelligent discussion of architectural problems is, of course, a prime necessity in this when the product at all affects design. In the writer's observation it does not necessitate even for this class of materials that the salesman be a trained designer, valuable as that asset may be. The point merely is that where the salesman, whatever his product, will endeavor to fit himself to discuss with reasonable intelligence and helpful suggestiveness any question in use of materials generally from the standpoint of a broadly cultivated knowledge, he is fairly well equipped for the footing which will make him a personally welcome visitor and an effective representative of his business. This is true whether his product is a decorative one or only that unlovely feature of necessary utility which adorns every bath room.

Whatever it is the salesman must be prepared to be a good sport. Perhaps, it may be admitted, an unusually good sport. He must, in fact, be quite content to all outward appearances to forego having his material selected where such adverse decision will help the success of the architect's project, if this clearly calls for some other material more appropriate for the particular result. And if he has the daring to assist the architect's knowledge of such other medium where this knowledge does not exist, he may be sure that the order will come back to him another day in another instance, perhaps without solicitation. I well recall an instance of this in my own experience when at a later date the result came home in successfully holding a large contract against the bitterest price-slashing competition. It was not the mere gratuity of a quid pro quo, but the fact that vigorous persuasive effort when made in this case was taken undiscounted and heartily backed up in a battle with the owner who had to be persuaded that a fifty per cent higher price spelt success as against failure for his purpose.

Of course, this prestige rests also upon other factors than those just indicated. It requires that further indefinable something in personality

which commands immediate recognition of the fact that the salesman is of "the same class" as the man he is talking with. The salesman who enters and stands with his hat in his hand gets no further eventually than the man who forgets the due courtesy of laying his hat aside when he is once in. The average architect is a cultivated person with a keen appreciation of the social habits which distinguish his class, and it also goes without saying, has no use for the man who knocks his rival's product.

In closing, a word might well be said regarding the inter-dependence of advertising and personal sales effort. It is a matter of wonder that large sums should often be freely appropriated for the printed page, while the appraisal of necessity in the quality of follow up, results too frequently in a cheap form of personal service. The salesman is an integral part of the general advertising program and progressive manufacturers are coming more and more to realize that for architectural patonage, only high grade men are economical. Unfortunately there is another class so averse to any material expenditure in this line that it is turning to the expedient of concentrating only on the client and ignoring the architect with the view that demand for the product shall be forced on him.

It is unnecessary to point out how the psychological factor already alluded to in this connection will be encountered under this policy in greatly intensified degree. Granting that the architect after all is only human and likely to yield to his client's wishes, however grudgingly, there is no point in needlessly antagonizing him. With the growth of taste in architectural design evident everywhere throughout the country, it is clear that the trained architect will be more and more in demand as time goes on, his influence in the selection of materials more marked, and that no sales policy, building for a sure and permanent future, can afford to ignore this tendency.

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Architect Points Out Primary Principles on Building for Earthquake Resistance

By SUMNER HUNT*

THIS paper is a plea to architects and building contractors to remember that in any country earthquakes are a possibility, and in some countries a practical certainty, and to consider the effect of earthquakes on the buildings they plan and erect.

Outside of the geologists, who look upon earthquakes as a more than ordinarily interesting phenomenon and not as a terrifying one, the American public, generally, including even architects and building contractors, in localities where earthquakes are prevalent, are prone to emulate the ostrich who hides his head in the sand to protect himself from danger, and refuse to admit the fact of such a thing as an earthquake.

It is time we, in California particularly, admit the probability of earthquakes and learn that properly built structures will withstand, without serious damage, earthquakes of as great severity as any that have occurred here in the recorded past.

For the purpose of this article, "Class A" buildings will be but lightly touched upon, as the evidence shows that either a steel frame, or a reinforced concrete frame, engineered according to generally accepted formulae, will withstand the severest shocks; the only weakness developed in buildings of this class being from poorly built filler walls and poorly secured applied facing material and ornamental features.

*President of Southern California Chapter, American Institute of Architects. Paper read at meeting of Chapter, Los Angeles, Feb. 8, 1922.

The simple device of using light reinforcing and good cement mortar in filler walls and ordinary care in tying in of applied facing material and ornamental features will make these buildings perfectly safe. Perhaps the ideally-earthquake-proof building is the well engineered monolithic reinforced concrete structure, in which the structural material forms the finished facing, without the application of a veneer material, but as this in street architecture is generally not sufficiently rich or decorative, the opportunity for its use does not often occur.

As to buildings other than "Class A," an almost sufficient formula for earthquake resistance would be the simple one of building well instead of poorly, using the age old understanding of what constitutes good work.

In masonry walls, for instance, it is always the walls built with poor mortar that crack or fall. A good story illustrating the soundness of the good work formula comes from a committee sent some years ago to Imperial Valley to investigate the results of an earthquake there. The committee noted a considerable number of complete wrecks of buildings, built of cement blocks for the outer walls, and also noted other buildings of apparently the same construction that showed little or no damage. Investigation brought out the fact that these buildings, the wrecked ones and the ones standing in good condition, were all built by the same contractor, but the buildings in good condition were built by the contractor for himself. The moral is obvious.

As to details of good construction for earthquake resistance, we will start with foundations. They should be deep enough and heavy enough to insure against unequal settlement and to give something to which to tie the superstructure. In all frame buildings bolts should be built into walls. The mud sills should be firmly bolted down and joist and studding thoroughly spiked to sills. There are many instances of frame buildings having been thrown off the foundations at corners with of course a resulting dropping of the frame which, in cases of poor framing in superstructures, caused bad wreckage.

In the case of the common forms of vertical wood underpinning, on detached piers the wood caps should be bolted to masonry and there should be sufficient lines of vertical diagonal bracing in two directions to insure the whole building moving as one mass, as the action of an earthquake takes the form of pulling the foundations out from under the superstructure, and if the building is so built that this is not possible a great element of danger is eliminated.

If the common method of frame construction, that of building one story at a time, is used, the upper story should be thoroughly spiked to the story below, this again to prevent the lower story moving out from under the upper. The roof construction also should be well braced and tied to the story below.

The same amount of diagonal bracing and bridging and tying that a good builder puts in for wind bracing and general stiffening will insure the requisite stiffness to withstand an earthquake shock.

In brick construction, there should be more cement used in common brickwork than is customary. One should know that bricks are wet before using and that the brickwork is well bonded and that the cement goes into the mortar. As stated above, it is the poor masonry that goes to pieces in an earthquake shock.

More care should be taken to thoroughly anchor joists to brick walls. Some builders will fairly well anchor end joists and be careless about anchoring parallel joists, forgetting that the wall needs the bracing given

by the floor just as much as the floor needs building so it will not slip off the walls.

In the case of large roof spans, avoid the scissors type of truss! Be sure to get straight bottom cords to trusses and have them well bolted into walls. In the San Francisco earthquake there were some notable cases of power houses with high walls and long roof spans, with straight bottom cords, that withstood the shock splendidly. Any form of truss or roof that, under a shock, will develop a vibration of the main strut member has a tendency to push out the supporting wall.

The commonest visible evidence of damage from earthquake is in chimneys. Japan, where earthquakes are, one might say, an every-day occurrence, solves that problem largely by not building chimneys, but so much of the sentiment of home to the Anglo-Saxon is built around the fireplace that it is almost indispensable, and it is not easy to build a chimney high enough above adjoining roofs to insure draft and at the same time make it earthquake proof. If, however, we would build at least the end walls of our common chimneys 8″ thick instead of 4″ and build into these walls, at each corner, a ¼″ vertical iron rod with an occasional bond iron running entirely around the chimney and avoid the use of too much corbelling in the tops and use good cement mortar, we will have a chimney that will stand a stiff shock. Terra cotta flue linings tend to stiffen the chimney and reduce the danger from fire, due to cracks in the main walls, caused by an earthquake.

More care should be taken to curtail the height of street facade fire walls and in tying walls back to roofs.

More care should be taken to avoid unnecessary projection in cornices and to thoroughly tie same into supporting walls and to thoroughly support and tie in all ornamental features.

I would discourage the use of common form of hollow tile walls and partitions, I mean the form in which the only bed for mortar is the end web of the tile. If this form is used it should be reinforced.

There should be a state law that would provide and enforce a checking of plans for masonry buildings in small towns where there are no building laws. It is an unquestionable fact that the damage from earthquakes is more pronounced in such towns than in the larger cities where building is done under the supervision of a competent building department.

It is probable that the shocks of June, 1920, in Los Angeles were very nearly as severe as those of May of the same year in Inglewood, yet the damage at Inglewood was out of all proportion greater, due undoubtedly to poorly built structures, which were built on the go-as-you-please basis by contractors who perhaps did not know what really constitutes good building.

The establishment of district offices where builders from adjoining small towns would go for building permits would hold down the cost of such state supervision to a sum which, considering the danger due to present careless methods, we could well afford to pay.

In conclusion, this article is not intended as a technical treatise on the details of earthquake resistant construction, but rather, while calling attention to some of the simpler principles of such construction, is more of an urgent plea to all architects and builders to impress upon themselves the fact that earthquakes are possible anywhere and probable in many localities and to ask them to take the subject seriously and to so build as to minimize the dangers resulting from earthquakes and to remember that a good simple formula for earthquake protection is BUILD WELL!

Co-operation Between Architects and Contractors*

By F. E. DAVIDSON, of Davidson & Weiss, Architects, Chicago

TWENTY years ago there was the most close and intimate relation between the architect and the contractor and the relative position of both interests toward building operations was clearly defined and accepted by the most worthy custom and the most amicable relations were generally maintained.

In matters of the past we can think broadly, even though we all think a bit too narrowly as to matters of the present, for in the present some times our own passions and prejudices and predilections get in the way of our thinking, and thinking thus broadly on matters of the past, the reasons for co-operative relationship between the architects and the builders are apparent.

It is only proper to admit that even those in highest authority have certain well defined duties towards those whom they may direct or oversee, and I am prepared to admit that in the profession of architecture there have been many instances of unreasonable demands, often based on ignorance of facts, on insistencies and other things that cause irritation on the part of the builder, and it is equally true that on the other hand builders have failed to realize that the architect must necessarily retain some of his aesthetic attitude toward his building for he must build with beauty and without a sense of beauty and the refinement that should accompany it he can never create a result that will be satisfactory to him or to those who may compentently judge the building. This attitude is often misunderstood by the builder, who only sees what may be termed an ultra dilettante attitude toward the subject involved.

Architects Must Plan Well That Contractors May Build Well

Yet after all, only as architects plan well can the contractor build well. A structure well built must be one which has been anticipated in imagination and then by blueprint-integration even down to every detail. It is then, and then only with true fidelity that this can all be reduced by the contractor to terms of beams and brick and concrete.

Please do not understand me as doing any special pleading in behalf of the sins of the profession. True, many architects have surrendered their professional independence by accepting salaried positions in large contracting firms and permitting rubber stamp duplication of what for each job ought to be carefully thought out and original creative work.

Despite this, architecture as a profession has nevertheless remained the most complex and comprehensive profession in the world; and the most successful architect is a man who has devoted years to the study of his art, to the mastering of many branches of engineering involved, to the study of commercial law, to the problems of business administration, whereas the builder on the other hand is recognized as a business man and he is chiefly concerned with the business problems of construction and what he may know about law, what he may have learned about art, or any of the other multitudinous subjects which must be at the finger ends of every architect are only incidental to his work as a builder.

As society is organized it requires the architect and the builder to produce the finished structure. It requires team-play of the two interests for the best interests of each other, the owner and for the public good.

*Abstracts of an article in the American Contractor.

As I have earlier said, twenty years ago, in recognition of this situation, relations between the architect and contractor were most intimate and amicable.

But today, on the other hand, these pleasant relations have in many instances been strained to the breaking point, and it is a matter that contractors engaged in the business of building, and we, in the profession of architecture, should seriously consider, and if possible in a spirit of friendly co-operation endeavor to bring about better relations for the good of both, ever having in mind the best interests of the third party—the building public.

I do not deem it necessary to examine into the ramifications of present building methods, the insistencies of jurisdictional awards, the autocratic attitude of labor unions or to the two fires between which the architect stands and between which the builder also finds himself placed.

May I be permitted to say that the contracting element has shown a disposition to laxness in its allegiance to the architect and has in many cases allowed itself to become overawed by organized labor, by combines of material interests and other considerations directly affecting the cost of buildings.

Co-operation Essential to Rehabilitation

Contracting organizations as such have been accused of entering into agreements with organized labor and with material interests in an attempt to monopolize certain classes of work and thus secure to themselves profits greater than would be considered reasonable when the magnitude of the operation and the risk is considered. There has developed in many lines of contracting a theory that any method or any practice is legitimate and is to be approved if only it is successful, forgetting that principle of equity upon which the social structure of modern civilization is founded, that thou shalt treat thy neighbor as thyself. The Golden Rule has been revised to read, do others or they will do you first.

In order to rehabilitate the building industry it is necessary that every interest shall co-operate in the effort to do away with all existing evil practices, and to establish in their stead principles of fair dealing between all.

For a moment let us see what has been accomplished by co-operation between the architect and builder in times past. Need I refer to the co-operation between the architect and builder as evidenced in the preparation of standard forms of building contracts, the use of the quantity survey system, and the formation of the National Board for Jurisdictional Awards in the Building Industry? May not real co-operation be carried still farther?

One of the greatest problems confronting the building industry and one which has caused more grief and woe than any other question is labor's part in the industry. Collective bargaining between organized labor on the one hand and contractors' organizations on the other has not proven satisfactory to the public. The tendency always has been for contractors' organizations to slowly but surely recede and to in time grant to organized labor, not only greater wages, but to approve rules and conditions restricting and curtailing output, overlooking entirely the fact that the added cost of buildings must be paid for over and over again by all of the people in increased rentals for all time, and that there is a grave ethical doubt as to the right of any two parties to a labor controversy to make any agreement affecting wages and to fix working rules and conditions, binding the third party, the public, without the third party being

directly represented, and it is my suggestion that in all negotiations for collective bargaining between contractors' organizations and labor unions that the third party should always be represented and should be a party to the agreements, and by reason of his professional training and point of view, the fact that he has no affiliation with organized labor, associations of contractors or material interests, and the further fact that he is continually serving in a judicial capacity, I know of no one who may more properly be said to represent the public than the architect. . . .

I am also convinced that there is a great field for co-operation of the architect and builder in connection with the education and training of craftsmen. Today in all centers there is a virtual dearth of young mechanics. For some reason our young men are not learning the trades and craftsmanship as such is undoubtedly dying out in America. One of the greatest problems now confronting the building industry in America is the recruiting of skilled mechanics in the various trades. There is today an actual scarcity of skilled mechanics in most trades. Does the building industry realize that the ranks of the building trades were largely depleted during the war, that a large percentage of those who were building mechanics in 1917 are now employes in industrial plants or have found other means of livelihood, and when it is remembered that union officials have in many cases refused to admit men to their ranks, and in other cases have placed unsurmountable obstacles in the way of affiliations, and having in mind that during the past few years that the apprentice system in vogue in the large industrial centers to a very great extent has become obsolete, where may the building industry look to recruit the men that must be secured should a general revival of construction work occur?

Today we all recognize that building labor is inefficient, but do we realize that labor is inefficient in direct proportion as it is untrained? The average inefficiency of labor being, as I estimate, less than 60 per cent, adds millions to the cost of building operations. Based on the statistics of the F. W. Dodge Company, contracts awarded during 1921 in twenty-seven northeastern states amounted to over $2,390,000,000.00.

For the work covered by this report the efficiency of labor estimated at 60 per cent caused an actual increase in the cost of construction so reported of approximately $400,000,000.00. In other words, the increased cost of construction due to labor's inefficiency, if available for housing, would have permitted the construction of at least 100,000 additional homes during the year of 1921 and in a very large measure relieved the present housing shortage.

Every experienced contractor knows that the young men are not learning the building trades. They know that the average age of building mechanics everywhere is in excess of 40 years, and I maintain that the biggest problem now confronting the building industry of America is recruiting the ranks of labor with skilled mechanics.

Why should not the architectural profession co-operate with the builders by interesting themselves in trade schools and in the training of apprentices. Certainly the work accomplished by the architects of Philadelphia in co-operating with the Building Trades Council of that city is sufficient proof of the great good that might be accomplished by a general movement of this kind.

Let both the builder and the architect interest themselves in the trade schools, let the architect teach the young apprentice not only how to read plans, but to assist him in visualizing the architect's point of view.

May I repeat a story that I read the other day about an architect who visited a large stone yard and interviewed a number of workmen? The first workman was asked what he was doing. He replied, "Working for $10 a day"; the answer of the second workman to the same inquiry was "Carving this piece of stone." The third craftsman replied "Helping to build a cathedral." The vision of this third worker, a real craftsman, should be the vision of every apprentice and every workman in every craft—the vision that he is an important factor in the great building industry and that his part of the task is as important as that of anyone else and that a task well performed makes him a better craftsman, a better citizen, and adds something to the wealth of all.

Co-operation between the architect and the builder is today more necessary than ever. If the builder will but realize that his first interest lies in his close co-operation he may, in my humble opinion, in a very great measure overcome the menace of organization in labor, and standing shoulder to shoulder with the architect be able to dictate as they both should and not allow themselves and their clients to suffer by intimidation that insures in place of efficiency and reasonable building costs the most inefficient labor as well as an inflated wage scale. Of this there can be no question, as there is no question in any case where co-operation may reach its highest development, but both architects and builders must give and take, and each must, up to the very extent of his ability, meet the views of the other, only halting at a point that means poor results and harmful effects on the interests of clients.

The modern architect realizes that he must be a clear-sighted business man because if he is not he will find that he is losing in every discussion in which he engages with his contractor and builder, the very essence of whose success is the perfection of their business ability. It may not be inferred that this sharper training in commercial methods enables the builder to put over anything on the architect, but it must be assumed that if the architect, no matter how artistic his inclination may be, fails to have an equally thorough business acumen he will never be able to maintain his correct position in co-operation and will ultimately sink into contempt, as he will be regarded by every builder as an incompetent, as a dreamer, and a poor one to work with.

When Contractors Invade Architect's Field

This matter of co-operation between the architect and builder is a very simple every-day proposition and in its fundamental elements is no different from any other instance where co-operation is essential to the best development of any operation in which men are engaged.

I have often wondered to what extent the present apparent lack of co-operation between the architect and the builder may be charged to the now quite general requirement of the various states that the state shall control and regulate those calling themselves architects, and the tendency, all too apparent, for builders to disregard laws regulating the profession and to assume that they are a law unto themselves. The most responsible and best-known builders recognize their proper field of usefulness and rarely, if ever, trespass upon the work of the profession, but need I tell you of the thousands of cases where the contractor advises an owner that the services of an architect are a useless luxury and that he, the builder, can plan equally as well as any architect? I have no sympathy with those who conceive it to be the function of the builder to be also the designer, nor have I any sympathy with the suggestion made in some states that the state should license contractors. I can conceive of nothing

more disastrous to the building industry, to the business of builders, to our profession as architects, than to place the building industry under state control, as was sometime ago recommended in the state of New York when a proposal to create a state trade commission to regulate the building industry was defeated.

The profession of architecture is unalterably opposed to the architect who tries to build on the side and may I suggest that contractors just as unreservedly outlaw the builder who tries to play architect on the side. This is not a trade unionism doctrine. It is common, every-day horse sense.

Many builders, while they give lip service and hand applause to the recognition of the field of the architect, alone with the owner forget their Sunday profession by Monday practices in order to get the edge on a competitor. They talk about the architect being necessary only to himself. They tell the owner that they can provide all the plans needed to secure a building permit and to construct the building, and many times, I regret to say, that they induce the owner to fall for the "bunkum"—with what result? The owner who believes them is either a fool or a crook. He is either a man who knows nothing whatever about planning or building problems, or he is a man trying to get something for nothing, and right here will be seen the danger signal of trouble ahead.

Not knowing the builder's problem, the owner is not sympathetic to it. He has not either the indulgence or the instinct to be sympathetic with them and remember in these cases their appeal to the architect is cut off. An architect in his professional capacity is an owner's professional personality. He is the owner's mind in the building problem and without the architect as a go-between the builders and the owner, another profession, that of law, usually comes into the fight between them and both have only to show a black eye and the loss of litigation, and for what? Nothing! Remember, that with an experienced architect in charge of the work the usual questions affecting the contract, such as changes or additions ordered after the work is started, will be adjudicated by the architect and that in 999 times out of every 1,000 his findings will be fair to both builder and the owner. On the other hand, without the architect the lawyer will litigate for contractor and the owner and no matter who wins, both lose.

Let me summarize a few matters that in my opinion are proper subjects for the co-operative efforts of the architects and builders.

Why should not the scope of the work of the National Board of Jurisdictional Awards in the Building Industry be extended to cover the matter of the preparation of forms of agreements and working rules, wherever collective bargaining is the rule in the building industry? Why should not the board also be entrusted with the task of fixing the minimum wages for all the building trades in all localities of the United States? Why should not builders' associations be relieved from any and all duty in connection with the preparation of trade agreements and working rules? Why should not all these matters be referred to the national tribunal, the National Board for Jurisdictional Awards, whose organization might be changed so as to be composed of every important interest having to do with the building industry? Why should not this board set as a court of original jurisdiction as well as a court of last resort with power to decide any and all questions which may arise at any time and between organized labor and organized associations of contractors, or between two or more associations of contractors, or two or more unions?

How May We Stabilize Business for 1922?

By J. W. FRICKE*

IT SEEMS to me but a short while ago that I stood before the splendid assembly of the National School Supply Association and addressed you as members on a subject vital to us at that time. This short while, nevertheless, comprises a whole year, which has rushed into the ocean of time, faster, swifter, than the golden Feather River of California, which murmured to me as I whipped its onward stream hardly three fortnights ago. From its depths came that thrill which enraptures the very heart and fills with joyful gleam the eyes of a business man who has loftier ideals than those lashed only to an office desk overladen with the daily monotonous task of life. To be with you again this year gives me much pleasure.

We have come to this conference with the same end in view as last year, yet with better understanding and greater vision—I stand here this morning by an absolute decree. Our honorable business director, Mr. Vinson, with his staff associates, wrote me in a letter dated November 10th: "Without your knowledge and consent we placed you on the program for the first thing Wednesday morning to discuss the question of 'Stabilization of Business for 1922.' The program in hand asks for the discussion of this question from the standpoint of the jobber." In placing me in the foreground for this discussion, Mr. Vinson must have been lured on by articles of Mr. Hinman, the noted editor and authority on business who on the 23rd of last month in one of your foremost Chicago papers informed the world that the business map of the greater part of California is white, Illinois shaded considerably, and some states solidly black. Be that as it may, as one who's cradle stood in this great metropolis and railway center of the world, I have covered 2260 miles by nearest railway to be here to say,

"Not without thy wonderous story,
Illinois, Illinois,
Could be writ the nation's Glory,
Illinois, Illinois."

The subject allotted to me is so deep and extensive that my paper and views can only be considered an incentive or stimulus for you to bring out of the golden shafts of your wisdom and experience valuable addenda by expression and discussion.

"How may we stabilize business for 1922?"

The year 1920 and the first half of 1921 with their many troubles might be likened to the days of Pharaoh with their many plagues. Everybody but especially the harassed business man, is looking anxiously ahead with the hope that a second "promised land flowing with milk and honey" may be discovered, a land abounding in "Manna" and without such modern "plagues" as price cutting, "buyers' strikes," fluctuating prices and zero profits.

Perchance a Moses is needed to lead the members of the National School Supply Association "out of the wilderness," but as the speaker is neither a prophet nor the son of a prophet, he can hardly venture to assume that role. It can only be his province to try as best he may with his far from prophetic vision to give you a glimpse of this much-desired "promised land" with the stabilized "straight and narrow way" leading thereto.

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An address before the members of the National School Supply Association, Chicago.

In seeking the key that may unlock the door leading to this "straight and narrow way," it must be remembered that such far-distant troubles as the famine in China, the "tobogganing" of the German mark or a strike in Great Britain may all have their influence on stabilizing business in America. With the coming of the steamship, the locomotive, the aeroplane, the telegraph, the world in its business relations has become, after all, a small place. Chicago by wireless is less than a half minute distant in time from London or Tokio.

The business depression or prosperity of any nation is quickly reflected elsewhere, and so the whole question of stabilization is interlocked with conditions affecting the world, the nation, all types of business and finally the individual. But whether the question of the stabilization of business be approached from the world or national viewpoint or from that of the organization of the individual, its gradual economic solution simmers down very largely to the two great C's—Confidence and Co-operation.

A Word on World Stabilization

All history shows that periods of business depression follow all wars and financial panics. Recall the wrecked business conditions following the Napoleonic wars, our own Civil War, and the panic of 1873. In these, and other cases that might be mentioned, stabilization came with renewed confidence and co-operation. But as the recent World War left a greater burden of death, of debt and of world, national, business and individual demoralization as its aftermath, so will the return of stabilized business conditions be a problem greater and in some way more difficult to solve, than those of past decades.

Consider our foreign exports alone. During the first eight months of 1921 our exports decreased nearly two and a quarter billions of dollars as compared with 1920. While the "slump" in prices accounts for some of this loss, by far the greater part was due to decreased buying power on the part of our foreign customers. And remember, too, that this steady decline in exports represents very largely manufactured goods.

A committee representing the Chamber of Commerce of the United States, after a recent tour of Europe to study business conditions, issued a report in which they say that upon a conservative estimate "the consumption of 300,000,000 people in Europe has been reduced to not over 30 per cent of what it was before the war." Certainly this loss of purchasing power has directly affected business in a world-wide way. It is not claimed that this world situation has directly affected the school supply, furniture or equipment business in the United States. It can hardly be questioned, however, but that some of our troubles are traceable thereto.

Without taking the time to discuss such questions as the international credit situation, the foreign debt, competitive armaments and others, it goes without saying that the sooner the nations learn the lessons of confidence and co-operation the sooner will the "scars of war" be forgotten and the sooner will world business be stabilized. The hoped for success of the International Conference on Limitation of Armaments now in session in Washington will, if realized, go a long way not only toward assuring world peace, but to decrease national expenditures and debt and gradually to bring about a world stabilization of business. And all this will come to be if the nations only give heed to these noble words of President Harding in opening the conference:

"The United States welcomes you with unselfish hands. We harbor no fears; we have no sordid ends to serve; we suspect no enemy; we contemplate or apprehend

no conquest. Content with what we have, we seek nothing which is another's. We only wish to do with you that finer, nobler thing which no nation can do alone.

"We wish to sit with you at the table of international understanding and good will. In good conscience we are eager to meet you frankly, and invite and offer co-operation. The world demands a sober contemplation of the existing order and the realization that there can be no cure without sacrifice, not by one of us, but by all of us."

National Problems in Brief

With the beginning of the period of deflation and business depression in 1920, it seemed certain that business in general would not revive without at least three things: (1) Cheaper and more plentiful money; (2) a lowering and stabilization of prices, and (3) the restoration of confidence on the part of consumers. Throughout 1921, both in the school supply, furniture and equipment business, and in practically all other lines, business has revived as these conditions were brought about. Certainly money is now more plentiful in most sections and at lower interest rates. Prices of many commodities have been "cut to the bone." The confidence of the consumer is slowly returning.

It is much to be regretted, however, that the Congress has been so slow in passing remedial legislation, the uncertainty of the outcome of tax and tariff revision, of railroad legislation and of other proposed laws have, to take the most charitable view, retarded a general revival of business. Whatever may be your views or the speaker's as to the tariff or the income tax or the railroad funding bill or other moot questions, we can at least agree that they should, one and all, be settled at once so that business may know exactly what to expect. It seems but fair to say that business is reviving not because of Congressional action, but in spite of it. This at least is the case in California.

A Lesson From the Golden State

Perchance the speaker may have wearied you at times with his perfectly truthful eulogies of the wonders of California with her climate, her big trees, her Yosemite and numerous other attractions you know not of in the "benighted east." Today (before proceeding with the discussion of stabilization), he ventures to call your attention to the California way of supporting her schools. Doubtless you will note the connection with the main issue. The states have invested in school property, in dollars per child, all the way from $14.72 in Alabama to $148.30 in California.

Not content with this remarkable showing the voters of California on November 2, 1920, by a majority of more than 200,000, passed a constitutional amendment providing that hereafter the state shall contribute out of its treasury toward the support of the public schools an amount which shall be not less than $30 per pupil per year in average daily attendance in the elementary and high schools, and that the counties must raise in addition at least $30 per pupil in average daily attendance in the elementary schools and at least $60 per pupil in average daily attendance in the high schools.

Under this constitutional amendment state support for the elementary schools was increased approximately 50 per cent, while state support for high schools was increased fully 100 per cent. Beginning with July 1, 1921, California will give about seven millions of dollars yearly to her schools more than ever before.

This amendment equalizes educational opportunity in California. It established the principle that money for the schools "shall be raised where income is and distributed and expended where children are." It means throughout California better salaries for teachers, better school buildings, better equipment, better schools. The California plan is commended to

you not only as parents and citizens, but as an ideal step for any state to adopt in financing the schools.

The Lessons of 1920 and 1921

Looking backward through less than two short years, we can see, in the eloquent words of President Harding that "there can be no cure without sacrifice, not by one of us, but by all of us." When inflation ceased, prices "tumbled" and the "buyers' strike" was on, then sacrifice began in the business world, but not nearly "by all of us." And there has been the trouble and there is "the lesson of 1920 and 1921." Few of us at first saw the "handwriting on the wall." Few of us at first recognized the absolute fact that the prices of all manufactured products must be deflated along with wheat, sugar, flour and other necessities. Few at first, whether concerned with agriculture, manufacturing, labor, jobbing or transportation, took their losses promptly with prices and wages stabilized on the deflated basis. Too many waited for "John to do it."

Happily in time the business world more and more saw that, with decreased buying power on the part of the consumer, losses must be taken. As the "buyers' strike" grew, prices slowly "zig-zagged" downward. The more rapidly prices sought the new level, the more quickly confidence of the consumers was restored. If the sacrifice of profits could have been made promptly by "all of us," there could hardly have been any "lesson of 1920 and 1921." With the lesson before us so plain that "he who runs may read," it is clear that complete confidence may be restored and buying renewed only on a stabilized fair price basis. In this connection these words of President Harding in his inaugural message are well worth remembering: "A measuring rod of fair prices will satisfy the country and give us a business revival to end all depression and unemployment."

According to the program, the speaker was expected to discuss the question at issue from the jobbers' standpoint. From what has been said, it seems fairly clear that, if business is to be stabilized for 1922, the jobber, distributor, manufacturer, consumer, will all see the many problems involved "through the same glasses."

The consumer needs our wares and needs them badly. Restore his confidence and he buys. The manufacturer is willing to go ahead "full steam." But to dispose of his wares he must take into account not only his own over-head with reasonable profits, but take into account the viewpoints of both consumer and jobber. And the same with jobber and distributor. In other words, there should be no distinctive consumers' viewpoint, manufacturers' viewpoint, jobbers' viewpoint. Let us seek to look "through the same glasses," and reach a common viewpoint to the profit of all concerned.

The Two Great C's—Confidence and Co-operation

The business structure is built upon confidence and the cornerstone and foundation of confidence is co-operation. Here are the two great C's to take into account in seeking an answer to the question, "How may we stabilize business for 1922?"

Lack of confidence on the part of the consumers along with decreased buying power, led to the "buyers' strike." Lack of confidence on the part of some jobbers and distributors certainly had much to do with price cutting. Lack of confidence on the part of some manufacturers led to delay in stabilizing prices for 1921 with later partial demoralization of business.

Happily much of this, though not all, is ancient history. Remember, however, my brothers, that we may interpret the future much better by taking into account the mistakes of the past. Facing a distinctive buyers' market with many buyers still waiting to be "shown," they must be inspired with confidence not only in the quality of our wares, but in our prices, policy and service, and that can only be done on the basis of co-operation.

No patent cut-and-dried recipe for restoring confidence through co-operation may be given in its details, but again remember in the words of President Harding, "there can be no cure without sacrifice, not by one of us, but by all of us." And remember, too, that we may not hope for steady buying on the part of the consumers unless we have their confidence, nor may we gain their confidence unless we ourselves face the coming year with a confidence based on a selling program worked out on a co-operative basis —with fair, stabilized, guaranteed prices as the cornerstone.

What of 1922?

Do not imagine from the analysis given that the speaker has anything but a feeling of optimism as to the outlook for 1922. Deflation through many bumps, jars and "zig-zags" has almost run its erratic course. Slowly "all of us" have learned, or almost learned, that something of sacrifice must be made not only for the general good, but for self as well.

The outlook for 1922 could not be brighter. With a complete standardization of guaranteed prices on a basis fair to manufacturer, jobber, distributor, consumer, the curve of sales is sure to move upward throughout 1922. The school building program of the nation is fully two years behind what it should be. The sale of school bonds during the greater part of 1921 marked a distinct gain over 1920. Cheaper money is reflected in an improved bond market at much lower rates of interest.

With interest rates lower and with a clamoring demand for new school buildings and equipment all the way from "The Hub" to the Golden Gate, it is safe to predict that school bond issues and special school building taxes will be much greater during 1922 than for 1921. All this means a constantly increasing demand for practically all lines in the school supply, furniture and equipment business. One warning, however, to manufacturer and jobber alike. We have faced one "buyers' strike," even now not entirely a thing of the past. None of us, whether manufacturer, jobber or distributor, care to see another, but see it we may unless we retain the confidence of consumers through fair prices, stabilized prices and one hundred per cent service all along the line from the factory to the school.

* * *

Baths and Bolshevism

A well-known Socialist is credited with having said that Bolshevism will never make much headway in this country because we have too many bathtubs.

That is only another way of saying that "cleanliness is next to Godliness." There is something so incompatible between soap and water and evil that they are seldom found in close association.

External cleanliness is not always a sign that things are clean within any more than "company manners" are proof of domestic bliss in the solitude of the home after the visitors are gone.

Yet the reverse is almost always true. The clean heart demands a clean outside.—St. Louis Globe Democrat.

Spray Painting

By RAY W. TRIPP in Building Management

THE use of spray painting equipment operated by means of compressed air, although a comparatively new process of applying paints and other protective coatings, has been extended to a great many new fields during the last year or two. The most noteworthy are the interior decorating of office buildings, institutions, etc., and the interior as well as exterior work on houses and buildings of all descriptions.

Unusual demands placed on the paint industry during the recent war were really responsible for the further development of the first paint guns or air brushes, as they are sometimes called, which were used on large surfaces such as ships, war materials, factory interiors, and similar work. Since then, of course, the equipments, operating technic and especially the paint guns have been improved from time to time until today the outfits are perfected, as well as foolproof. At the present moment the most exacting finishing problems are solved through the use of spraying equipment.

Painting with compressed air and a paint gun requires no introduction to the building manager, master painter or general contractor as the practice is now widely extended. In this age of mechanically operated tools all who handle paints, either making, buying or applying, are familiar with the operation of the newest and most radical development in the science of painting—pneumatic spraying equipment, and the immense saving of labor through the use of the paint gun is self-evident.

Observation and experience on many thousands of satisfactory installations have disclosed interesting facts worth noting at this time. The air scheme of painting enables one operator to paint more square feet of surface than six or eight painters using hand brushes, and to secure finished surfaces which are superior to those painted with a brush. Where single coat work is desired a lighter or heavier coating can be obtained than is possible with a hand brush. Inaccessible surfaces that are difficult to reach with a brush are rapidly painted, as the paint gun may be quickly mounted on an all metal sectional extension pole whenever the operator wishes to paint a surface beyond his reach. Ceilings and walls up to about twelve feet in height may be painted without staging and ladder work; the use of scaffolding or staging is reduced at least 50 per cent on any job. Brush marks, skimped places and laps are entirely eliminated and the covering and wearing qualities of materials are increased. All paints are sprayed to equal advantage at the same consistency as for brush work. Material containers are air tight, which prevents the formation of paint skins, and makes it impossible for dirt to become mixed with the paint.

The next point to be considered is the type of equipment required for work such as the building manager has under his control. The standard equipment recommended and used on this work consists of a portable container of 5 or 10 gallon capacity, with control head for regulation of air and paint pressures, this head containing reducing valves, air and paint strainers, pet cocks and indicating gauges, a paint gun of suitable design, with two guns operated from one head, if desired, an all metal sectional extension pole, and air and material hose in lengths to meet all requirements. A portable compressor outfit, either gas engine or electric motor driven, with air storage tank, necessary gauges and safety valves will complete the outfit.

Realizing that there are certain little "touching up jobs" to be done almost daily in every large office building, one of the largest manufacturers of spraying devices has just perfected a smaller outfit for this class of work. This small outfit comprises the following: a paint gun attached to a one-pint aluminum container by means of quick opening adjustable clamps, suitable lengths of air hose and a small portable electrically driven compressor. The compressor is operated by such a small motor that it may be connected to an ordinary lighting socket, making painting problems as simple as cleaning ones are through the use of the vacuum cleaner.

Of course, the larger outfit mentioned above is absolutely necessary wherever large quantities of work are to be done at one time. The ideal installation usually calls for both outfits as the building manager of today has more than one building under his control and painting is a continuous performance from the beginning to the ending of each year.

Catechism for Paint Users

Anticipating questions which will arise in the reader's mind, these questions and answers have been arranged:

What is the loss of paint, using spray method?

None, if handled according to operating instructions.

What is the covering capacity of the spray on large buildings?

Minimum, 4,000 to 5,000 sq. ft. per 8 hour day; maximum, on large surfaces, 10,000 sq. ft. per 8 hour day.

Can sash and small trim be painted by this method, and is it advocated?

By using a line board such work may be done, but not to advantage. One man with a gun on the main body of the building will keep two men busy with brushes on the sash and trim.

Can the woodwork in an office be coated?

Yes, by using a line board and masking glass often found in partitions.

How much air pressure is necessary to operate gun at maximum capacity?

For average work, 50 to 55 lbs. pressure.

Can the spray be regulated?

Yes, it is possible to secure a round conical spray or a broad fishtail spray, and thickness of paint film may also be easily regulated.

What is the width of the spray?

It corresponds to an 8 or 10 in. brush when the gun is held 6 ins. from surface to be coated.

How is it possible to handle different paints with the same equipment?

By means of different air and material pressure, as well as adjustment of material control on gun.

How are cold water paints, bronze solutions and heavy lead paints kept in suspension?

An air-operated agitating attachment is furnished for this purpose

Will the spray gun clog?

No, if material is properly strained and the gun cleaned after each day's work.

Is is possible to do outside painting on a windy day?

Yes, by holding the gun somewhat closer to the work.

Is the use of pneumatic painting equipment advocated by paint manufacturers?

Yes, resolutions favoring the use of spray painting machines were adopted by the Paint Manufacturers' Association of the United States and approved by the board of directors of the National Varnish Manufacturers' Association.

Another question often asked is the following:

How has this method been received by the master painter, the manager and the journeyman painter?

The master painter has been impressed with the fact that the spray method of painting practically creates a new field for him, and another excellent reason is that it increases his volume of work, which means greater profits. The manager or owner welcomes the spray method, as it enables him to paint at a reasonable price, making his offices and buildings more desirable, whereas if the work had been figured on brush costs, the price would be prohibitive. The journeyman painter favors the equipment because his occupation has been made much less laborious than with brush work.

There is no doubt that many million dollars' worth of building failed to receive the customary coats of paint during the recent era of high prices of materials and labor. Much of this neglected work now demands immediate attention if the property is to be saved. New building, which we are sorely in need of, will soon be demanding its share of protective coatings. The field for this invaluable aid to modern building is surely extensive.

Pneumatic painting equipment has proved its value beyond a doubt and has earned a permanent place in up-to-date business practice. It is one of the most important agencies through which the wise and comprehending employer makes his employe's job a pleasant and healthful one, at the same time securing more and better work. Surely, every user of paint or finishing material owes it to himself fully to investigate the possibilities of spray method as applied to his particular work.

* * *

The Builders and the City

The picture once painted or the poem sung, it stands henceforth by itself; the artist can do no more for it. It must live or die without further help from him. But the city is never thus entirely separated from us, its builders. It remains tied to us by the invisible cord of nourishing passions. It grows with us or it dies with us. It is in a more real and personal sense a part of us, as we are of it. It becomes then the reflex of the lives and aspirations of the people who dwell in it. So that a city—its streets, its highways, its buildings, its public places, as well as its business and life—is an embodiment of ourselves. It is this living spirit that may hearten and inspire us; that may delight and enchant us, and that may also break and destroy us.

—Temple Scott.

* * *

The New American Architecture

Simplicity and truth are two outstanding features in the national type of American architecture which is noticeably developing under the urge of commercial and civic growth.

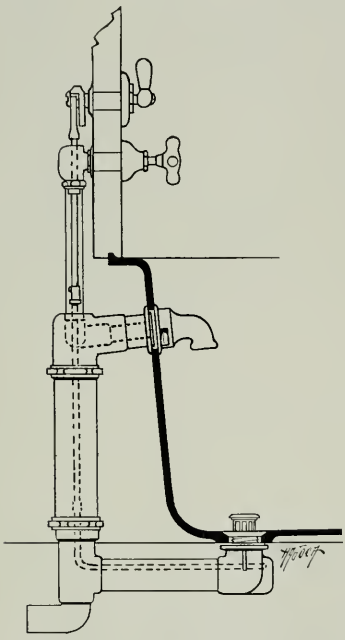
There is little ornament and not much attention to the ornate in this type of building. These modern American structures are just what they seem to be. They are imposing and impressive. Some of the best examples of this new American architecture are found in the commercial and public buildings of the Pacific Coast.

Progress in Sanitation *

By ARTHUR J. PHILLIPS

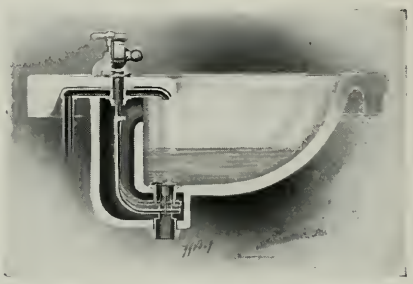
WITHIN comparatively few years marked progress has been made in modern sanitation. Today we enjoy refinements in the home bathroom and public toilet unheard of a generation ago.

The tiled-in bath may be cited as one of the most conspicuous of such advances. This type of fixture has not only added charm to the modern bathroom; it has, moreover, materially lessened the keeping of such rooms spotless. Not a few sanitarians and health authorities have investigated in connection with such baths, various types of wastes through which the used water may be completely discharged without any possibility of residue backing up into the tub when fresh, clean water is drawn for another bath, and have found that a waste, to be perfectly sanitary, should not permit any water in the tub to come in contact with any hidden pipes or connections from which might be dislodged soapy residue or possible disease germs from previous bathers, for dislodging such material would contaminate the supposedly clean water in the tub. Health authorities give full approval to those types of bath wastes which confine within the bathtub every drop of water during the bath and which permit rapid and complete discharge when the stopper is raised without any possibility of any of the discharged water or residue backing up into the tub at the next drawing.



A Sanitary and Clean Water Bath Waste.

This feature of bath waste cleanliness is especially important in hotel and apartment bathrooms, where every precaution should be taken to prevent any possible contagion. The same reasons applying to bath wastes are likewise applicable to basin wastes. The specification writer's attention to such important details makes the difference between a sanitary installation and an insanitary one. In one of the foremost commonwealths, the health department has been conducting a vigorous educational campaign on this very phase of domestic sanitation and it is extremely encouraging when such factors for improved sanitary conditions enlighten the public on ways and means to insure the better con-



A Basin Waste which keeps every drop of water within the basin.

*Third of a series of special articles on Modern Sanitary Plumbing. The fourth paper will appear in April. Illustrations, courtesy of Haines, Jones & Cadbury Co.

A Dental Basin for cleansing the teeth and oral cavities

ditions which the industry is planning to make possible.

While on the subject of wash basins, it seems in order to mention the growing tendency to install in addition to a lavatory in private and other bathrooms, a small separate fixture for cleansing the teeth and oral cavities.

The sanitary advantages of the dental basin are too obvious to require further comment. Such a fixture should be considered indispensable for college dormitories and like structures, and its use, moreover, should be recommended in private bathrooms as well. Dental basins are usually small and compact, not exceeding 14 x 13" in dimensions, and are equipped with combination hot and cold supply fixtures discharging water through a goose neck, a portion of which is diverted through a flushing rim inside of the basin, so that a copious supply of water cleanses the basin when these supply valves are open. The basin is usually furnished with an open grate, which discharges the waste water as soon as it falls into the basin.

For public wash rooms, lavatories should be equipped with liquid soap dispensers, thus providing means for users to obtain a supply of soap untouched by other hands. Manufacturers can furnish on specifications such lavatories drilled specially so that a dispenser may be installed at the side of one of the faucet holes. Where such special drilling is not desired, the dispenser may be installed in the left-hand faucet hole and a double mixing faucet installed in the right-hand faucet hole. Unless it is absolutely necessary to conserve the water supply, it is advisable in public installations to equip wash basins with faucets that can be kept open, so that the users may wash in running water if desired. Where, however, water conservation is necessary, the self-closing faucet should be employed.

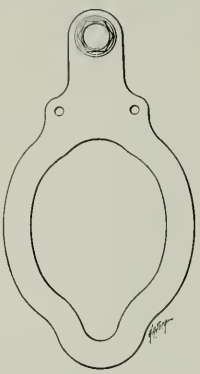
Another outstanding feature in modern sanitation has been the perfecting of the so-called "quiet" closet.

A Public Wash Basin equipped with Victory Soap Dispenser.

A Quiet Closet with supply piping concealed

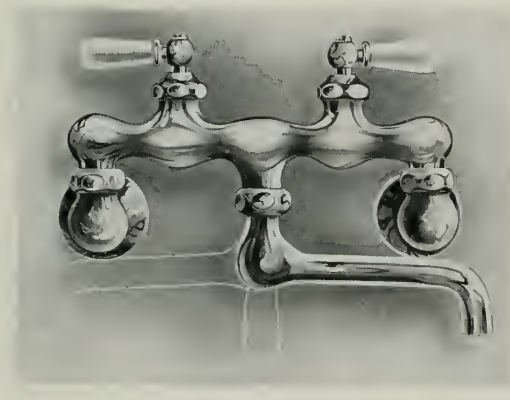
In this connection, caution may be necessary relative to the word "quiet." Quiet closet action is the desideratum of every closet maker; yet this should never be attained at the expense of flushing efficiency, nor should it be overlooked that careful piping to the closet tank and away from the closet bowl is an essential for quietness. Much is added to the appearance of such closet outfits by concealing within the wall the supply pipe to the tank, having it enter the tank at the back near the top and having the tank mechanism to include the self-contained shut-off valve. It is desirable likewise to have all the metal parts covered with the popular white Ivoroid finish.

Another tendency in closet design should be mentioned: the sanitary projecting front which insures a bowl longer from front to back with its consequent sanitary advantages. At first the inertia of conservatism kept this type from the popularity it justly deserved. A decided change, however, has taken place, and this type is now considered indispensable for fine private bathrooms in hotels, apartments, etc., and is being frequently specified for modern residences.



Top view of closet showing the projected flushing rim at front and back of rim recessed.

In conclusion, there is now a decided tendency to equip kitchen sinks with a double mixing sink faucet instead of two separate faucets. The mixing device should have a swinging nozzle, which can be pushed back out of the way when not in use, and the valves should operate so as to give hot, mixed or cold water at almost an instant's notice.



The Mixing Sink Faucet

The faucet has proved a popular acquisition to modern plumbing equipment. It saves time and lightens the housewife's labors very materially.

The Why of Peeling and Scaling

WHY is it that paint curls up and drops off some parts of the walls and sticks perfectly tight on others?

The following discussion of the matter was prepared by National Lead Company's technical service department:

"When paint comes off plaster walls the defect may take place in two ways due to quite different causes. We describe these two defects as scaling and peeling.

"All materials expand and contract with changes of temperature and plaster walls are no exception. There is also some shrinkage of the plaster during aging. The paint film must therefore be sufficiently elastic to follow the movement of the surface over which it is applied.

"In addition to being elastic the paint must have certain penetration and form a firm bond with the surface painted.

"If a paint film becomes hard and brittle as it ages, it loses its elasticity and is unable to follow the changes which take place in the surface of the wall. It fractures instead of stretching. A continuation of the action, aided by the slight amount of moisture which may get in through the cracks, causes the edges of the pieces of paint film to curl outward, and, eventually, to come off.

"This is the explanation of scaling which is so often noted on wood and metal and less frequently on plaster walls. The hardening process which is the cause of this defect is nearly always due to certain pigments used in the paint, which through their action on the oil, bring about the brittle condition. Scaling nearly always takes place after the paint film has been on the walls for a long time, often as much as five or six years being required to fully develop the trouble, because of the fact that the hardening takes place very slowly.

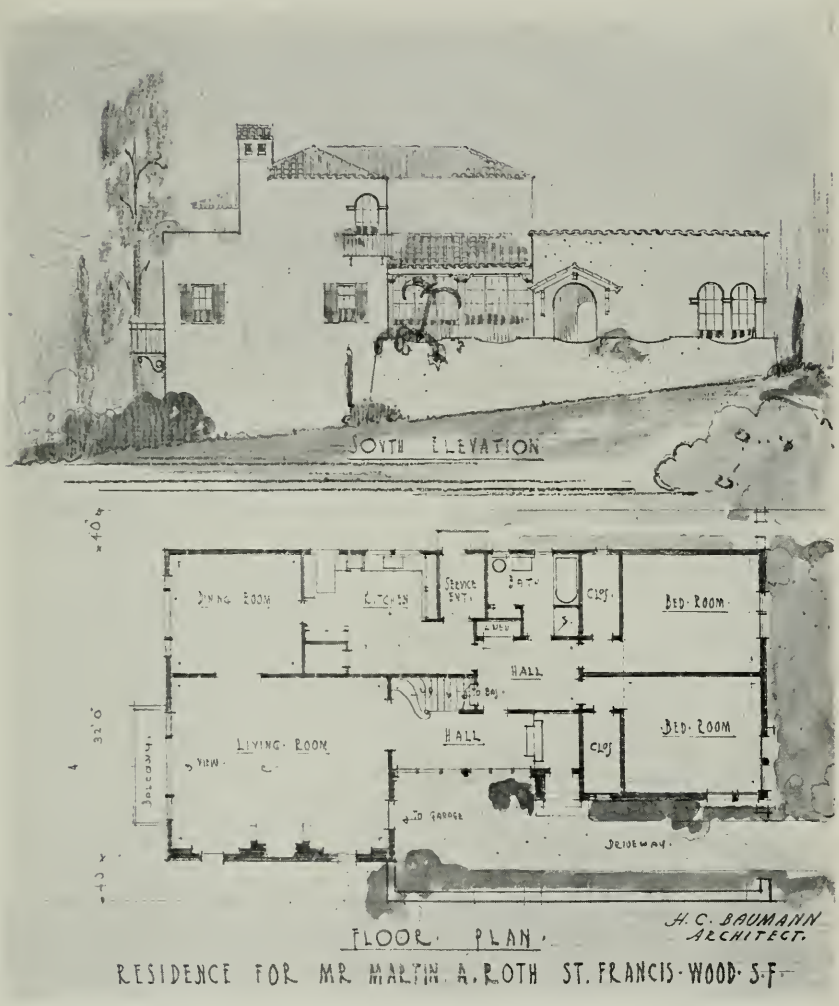
"In the case of peeling the pieces which come off are usually much larger than when the trouble is due to scaling.

"Peeling may take place at any stage in the life of the paint film, within a few days after application or after a number of years. It is almost always caused by moisture back of the paint film, due either to the painting of plaster while it is still wet or to leakage back of the plaster which works through to the paint. Peeling may take place with fresh paint film while it is still quite soft and elastic, or with older paint films which may be comparatively hard.

"As peeling is caused by moisture, it may take place with any kind of paint, but is fairly easy to prevent. Scaling, on the other hand, is directly caused by the character of the paint and may be prevented only by using paint made with proper materials. It is an outstanding characteristic of white-lead paint that cracking and scaling practically never occur when it is used.

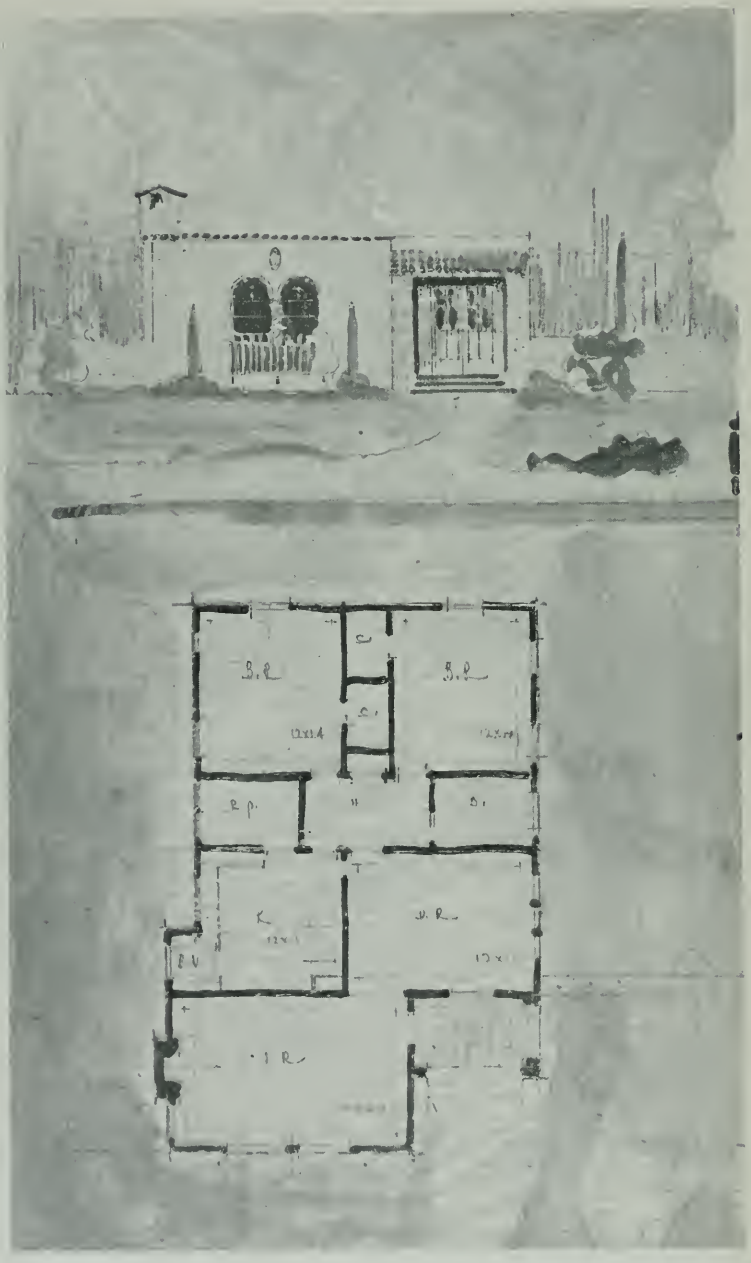
"Paint made with white-lead and the proper paint vehicles seems to have great penetration and readily forms a bond with nearly all surfaces on which it is applied. It also seems to remain elastic so that it follows the movement of the surface painted.

"These statements are by no means entirely based on theoretical considerations, as our many years of experience have shown us that paint made with white-lead is free from this trouble."

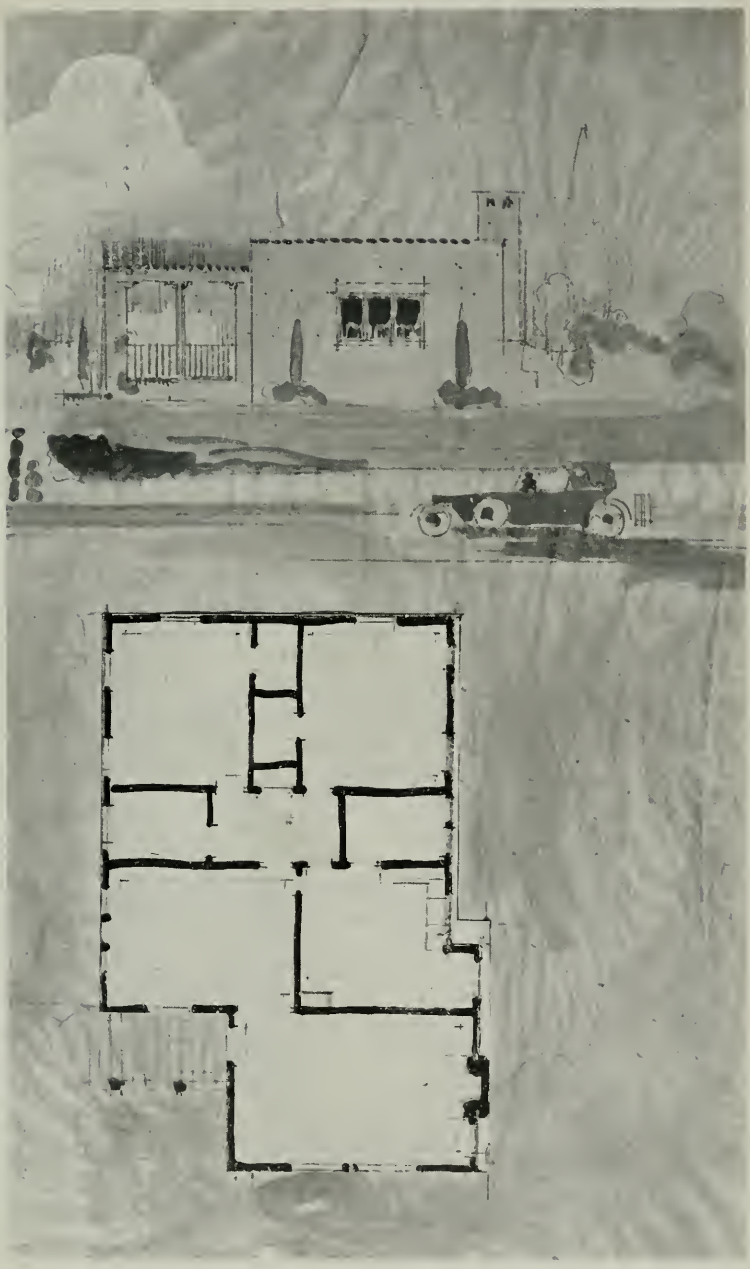


Medium Cost Homes

COMMENCING with this number The Architect and Engineer will show each month a portfolio of medium cost homes suitable for city and country sites. The demand for houses, ranging in price from $5000 to $20,000, is steadily increasing, and it is the purpose of this magazine to present photographs and working drawings of homes that have been built recently and which are not only livable but original in design and attractive in appearance. Several of the houses in this issue show a special plan for the conservation of space by use of wall beds and other built-in furniture. The wall bed has many advantages, particularly to the small home builder, whose financial circumstances require a house possessing a limited number of rooms.



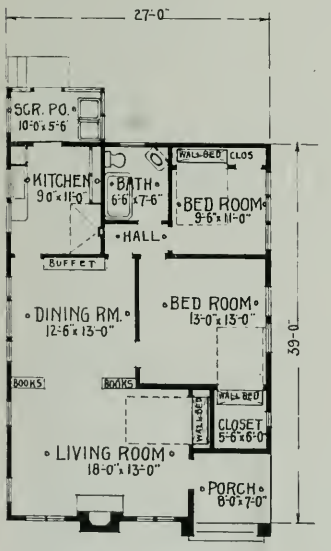
FIVE ROOM BUNGALOW.
H. C. BAUMANN, ARCHITECT



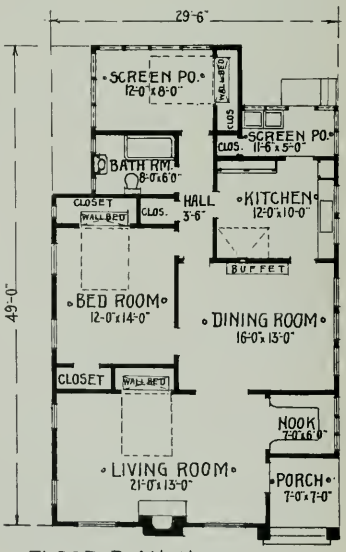
FIVE ROOM BUNGALOW. SAME FLOOR PLAN. H. C. BAUMANN, ARCHITECT.

A COSY AND ATTRACTIVE BUNGALOW

This lovely home, while having only five rooms, offers sleeping accommodations for six persons with all the rooms on one floor. The architect has used wall beds to conserve expensive floor space, by utilizing dining room and living room at night as bedrooms.



FLOOR PLAN NO. 3

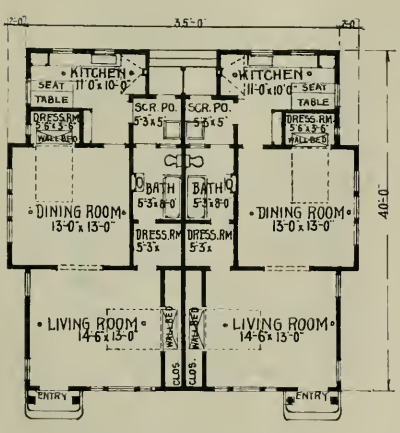


FLOOR PLAN NO. 4

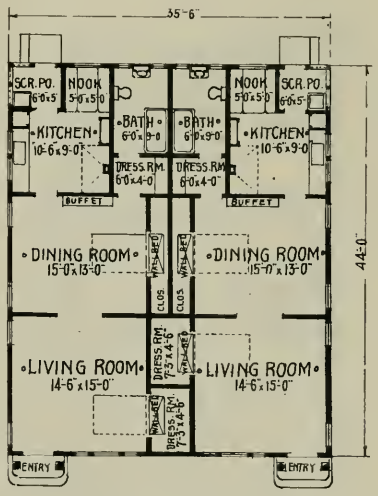
EITHER OF THESE FLOOR PLANS MAY BE USED

AN ATTRACTIVE DOUBLE BUNGALOW

This double bungalow with its two homes under one roof offers financial assistance to prospective builders. The owner has a comfortable home of three rooms free of rent while the income from his tenant pays interest, taxes and current expenses. Small investors have found this type of building very profitable.



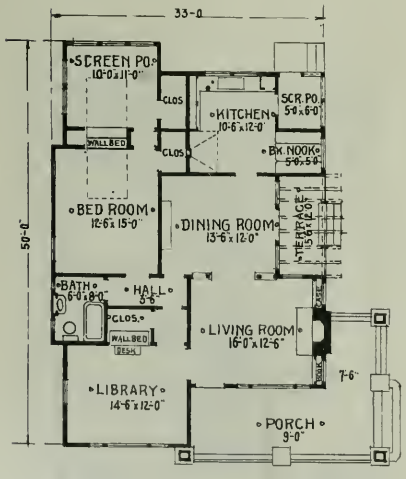
FLOOR PLAN NO. 25



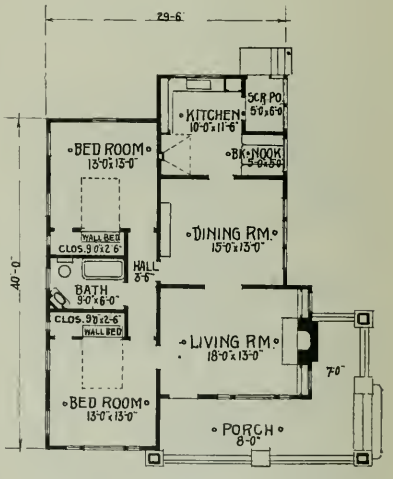
FLOOR PLAN NO. 26

BUNGALOW OF FIVE ROOMS

In plan 13 the library has been designed to be of service both day and night, being equipped with a wall bed, which is attached to the writing desk and invisible during the day.



FLOOR PLAN NO. 13



FLOOR PLAN NO. 14

EITHER OF THESE FLOOR PLANS CAN BE USED WITH THE ABOVE ILLUSTRATION

Finishing Interior Wood Trim

By A. H. BURT in National Builder

THE interior trim of a residence might be likened to the frame of a picture. Either can greatly enhance the beauty of the effect, or can seriously detract from it. For this reason the selection of the type of finish to be used on interior trim is of major importance. The unwise selection of but one material entering into the finishing, such as stain, can ruin the whole effect. Knowledge of the peculiarities of materials used in interior finishing is therefore equally as important as knowledge of finishing methods.

There are three popular methods used today in finishing the interior trim of residences. These are the stained and varnished finish, the stained and waxed finish and the enamel finish. The first two finishes can be used to advantage on any kind of wood, whereas, the enamel finish is very seldom used on anything but close-grain woods. In considering the finishing of interior trim, it is best for the purpose of discussion to divide the woods into two classes, namely, open-grain woods and close-grain woods. A list of the woods used for interior trim in this country is given below, divided into the two classifications:

Open-Grain	Close-Grain	
Ash	Bass wood	Holly
Butternut	Beach	Maple
Chestnut	Birch	Pine
Elm	Cedar	Poplar
Mahogany	Cherry	Redwood
Oak	Cypress	Spruce
Rosewood	Fir (Oregon Pine)	Sycamore
Walnut	Gum	White wood

The first step in the finishing of interior trim with stain and varnish is to be sure that the surface is in proper condition—that it is dry, sanded smooth and clean and free from stains. Stains on the trim can usually be removed by sanding, although in the case of grease, stains can be removed more easily with benzine or benzole, while paint spots are best removed with turpentine and then sanding. The next step after the trim is in condition for finishing, is the application of a stain.

Stains can be grouped under three classifications: acid, oil and spirit (penetrating). Each of these three classes of stains has a use for which it is particularly adapted, and under certain conditions will produce a more satisfactory effect than either of the other two stains.

Acid stains are stains made with water soluble dyes, and have water for their vehicle. This type of stain raises the grain of the wood, which makes it necessary to take more pains in the finishing where this type of stain is used. Where acid stains are to be used, most finishers will sponge the surface of the wood to be finished with clear, cold water, in order to raise the grain. When dry the wood is sanded, then when the acid stain is applied, there is little or no tendency to raise the grain. This extra operation in sponging and sanding the wood adds to the cost of the finishing, and in some cases it is not justified, due to the fact that just as attractive effects can be secured with other types of stains. Due to their tendency to raise the grain of the wood, acid stains are seldom used with any degree of satisfaction for the finishing of soft woods.

Acid stains would not be popular if it were not for the fact that they have certain advantages which offset their disadvantages. For example, red mahogany acid stains are almost invariably more fast to light than the red mahogany stains which are found in the oil stain or spirit stain groups. This makes it a distinct advantage to use this type of stain for the finishing of surfaces which are to be subjected to strong sunlight, such as exterior doors and the trim in show windows.

Oil stains are made with oils as a vehicle. These stains are ideal for soft woods, but hardly suitable for hard woods, where deep stained effects are desired, due to the lack of penetrating power of this type of stain. Oil stains do not raise the grain of the wood, and in their way are a preservative to the wood itself. They are very slow in drying, and the surface stained with oil stains is almost invariably wiped with a soft cloth about 30 minutes after the stain has been applied, due to the fact that there is usually a presence of pigment which has not been dissolved into the vehicle, which remains on the surface of the wood. If the surface were not wiped, a clear-cut stained effect could not be secured. Fully 24 hours should be allowed for the drying of oil stains before subsequent coats are applied.

Spirit stains, or so-called penetrating stains, are made from spirit soluble dyes. The vehicle in the stain is of the spirit type, frequently alcohol. Spirit stains can be used for finishing all kinds of woods, although the best effects are secured on hard woods—soft woods being more porous, take a darker effect. Spirit stains will not raise the grain of the wood, but differ from oil stains in that it is necessary to "seal" them into the wood with shellac in order to prevent them from "bleeding" into the subsequent coats of varnish, and impairing the drying qualities thereof.

Generally speaking, spirit stains are the most popular of any of the three types of stains. The colors of this type of stain are generally the richest. About the only difficulty experienced with spirit stains is that some of the red mahogany shades are not entirely permanent.

The next step in the finishing of the trim differs in the case of open-grain woods and close-grain woods. In both cases, however, all nail-holes and cracks in the wood are filled to a level surface with pure lead and oil putty tinted to match the finish. On close-grain woods, the next operation is the application of a thin coat of shellac—white or orange, depending upon the color of the stain. In the case of open-grain woods, the next operation after staining is the filling of the pores of the wood with paste filler. Fillers are applied in order to fill the pores of the wood, and bring them to a level surface, so that the subsequent coats will not sink into the pores of the wood, and produce an uneven effect. Where paste filler is omitted, a coat of shellac and a coat of flat drying varnish is usually applied to produce a so-called "mission" effect.

Paste fillers come in paste form and are reduced with benzine to the consistency of cream by the finisher, and then applied with a brush. The filler is allowed 30 minutes to "set up," or to dry out, and then is wiped off across the grain of the wood with burlap or excelsior, leaving the pores packed with this material. The wiping off of the paste filler tends to scour the surface of the wood, and bring out beautiful highlights in the wood. Since paste fillers are sold in various colors, they are sometimes used alone without stains for producing delicate stained effects on open-grain woods.

In selecting paste fillers, it is greatly to be desired that nothing but the best quality filler be purchased, because a great part of the unsatisfactory finishing results are due to the use of cheap paste fillers, which

either swell and cause little ridges to appear in the finished surface, or shrink and cause the varnish coats to sink into the pores after them. Unsatisfactory results are also sometimes secured with high quality fillers, due to the fact that sufficient time is not permitted for drying. Where possible, it is desirable that a period of 48 hours be allowed between the application of the paste filler, and the application of the subsequent finishing coat.

As stated before, a coat of shellac is the next coat to follow the stain on close-grain woods, while on open-grain woods paste filler is applied after the stain, and the shellac coat follows the paste filler. Expert finishers maintain that the shellac coat should be as thin in consistency as it is possible to have it, and yet serve to seal the wood thoroughly. The reason for this is that shellac is quite brittle, and differs greatly in elasticity from the finishing coats of varnish which follow it. If a heavy coat of shellac is applied, one has a brittle foundation for the varnish, which means that the finish will mar easily, because while the varnish may be tough, the shellac which is under it will splinter and powder, if the finish is subjected to a knock or a blow, resulting in an ugly effect in the finish, and making it appear as if the varnish itself is at fault. When thoroughly dry, the shellac coat should be sanded with No. ½ sandpaper, in order to "knock off" the gloss and rough spots, and to expedite the taking hold of the varnish coat which follows it.

The number of coats of varnish which are to be used, depends entirely upon the quality of finish desired. On the cheaper grade of work, one coat is usually all that is applied after the shellac coat. One coat, however, does not admit of satisfactory rubbing to a dull finish, hence where but one coat of varnish is to be used, and a dull finish is desired, it is best to use a special flat-drying varnish, which produces an imitation rubbed effect, of which there are several satisfactory brands on the market. While in the better class of finishing, three coats of varnish are sometimes used, it is the writer's personal experience that two coats of varnish will produce a high class and satisfactory finish. Where two coats of varnish are employed, sufficient time should be allowed for drying between coats, and the first coat of varnish should be lightly sanded when dry with No. 00 sandpaper to "knock off" the gloss.

The dull-rubbed finish is the popular finish today. This effect is secured by rubbing the final coat of varnish, when sufficiently hard, with powdered pumice stone and water, or oil. The water tends to harden the varnish, while the powdered pumice stone rubs down the gloss. Rubbing oils are preferred by some finishers, due to the fact that one does not have to be so careful about rubbing through the varnish coats down into the finish. Where rubbing oils are used, it is desirable to use either pure linseed oil or a high grade of rubbing oil.

The method of building up a waxed finish is similar to that of the varnished finish. Due to the fact that wax dries almost immediately after application, it requires a shorter period of time for finishing. The varnished finish is more durable and is probably more popular for this reason.

Where a waxed finish is desired, wax coats may be substituted for the varnish coats. The finish should be built up for this particular type in the same manner as it is built up for the varnish finish, up to and including the coat of shellac. Two coats of wax should be applied for a high quality of waxed finish. A high grade prepared paste wax is generally used, and is applied with a soft cloth.

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INSTITUTE ATTITUDE ON COMPETITIONS

Since its foundation, more than fifty years ago, the American Institute of Architects has given much attention to the conduct of architectural competitions. These contests, instituted when the direct selection of an architect could not be made, were for many years conducted without proper regulation and often in disregard to the interests both of the owner and of the competitors. The owner, totally unfamiliar with the intricacies of the subject, assumed, without skilled assistance, to prepare the program, laying down, or more frequently ignoring, rules to govern procedure.

With the growth of the country, the increase in expenditures for public and private buildings, and the increase in the number of architects, all the evils of ill-regulated competitions became more marked. Programs varied from loose and careless forms, difficult to understand and often open to the suspicion that only the initiated knew what they meant, to over-elaborate ones necessitating useless study of details and needless drawings. Those instituting the competition often had no legal authority to pay any competitors, still less to employ the winner. There was great economic waste, the total cost of participation exceeding the total net profit accruing to the profession from work secured through competitions.

Architects have learned that the outcome of a competition, unless governed by well-defined agreements, is largely a matter of chance. The owner has, to be sure, a choice of designs, but he is no more likely to make the wisest selection or to obtain the best building than if he selects his architect directly guided by the results previously achieved by the men he is considering.

When a competition is necessary or desirable, it should be of such form as to establish equitable relations between the owner and the competitors.

To insure this:

(1) The requirements should be clear and definite, and the statement of them, since it must be in technical terms, should be drawn by one familiar with such terms.

(2) The competency of all competing should be assured. The drawings submitted in a competition are evidence, only in part, of the ability of the architect to execute the building The owner, for his own protection, should admit to the competition only those to whom he would be willing to entrust with the work; that is, to men of known honesty and competence.

(3) The agreement between the owner and the competitors should be definite, as becomes a plain statement of business relations.

(4) The judgment should be based on knowledge, and since ideas presented in the form of drawings are intelligible only to a trained mind, judgment should not be rendered until the owner has received competent technical advice as to the merits of those ideas.

To sum up: To insure the best results a competition should have (1) a clear program, (2) competent competitors, (3) a business agreement, (4) a fair judgment.

Fifteen years ago many competitions had none of these provisions and few had all of them. The commonest form of competition was one that was open to all, had a program prepared by a layman, was judged by the owner without professional assistance, contained no agreement, and made no provision to eliminate the incompetent.

All this demanded correction. The Institute, seeking a means of reform, perceived at once that its relation to the owner could be only an advisory one. It might advise him how to hold a competition, but it could go no further. To architects in general the Institute could scarcely presume to offer even its advice, but being a professional body charged with maintaining ethical standards among its own members, its duty was to see that they did not take part in competitions that fell below a reasonable standard.

It was, therefore, voted in convention that members should be free to take part in competitions only when their terms had received the approval of the Institute. Thereupon the latter fully stated the principles which should govern competition and defined the conditions prerequisite to the giving of its approval. Committees throughout the country are authorized to give its approval to competitions when properly conducted, but unless a program has received such approval members do not accept a position as competitor or juror, nor does a member continue to act as professional adviser after it becomes evident that the owner will not permit his program to be brought into harmony with the principles approved by the Institute.

One of the most satisfactory competitions held under the above rules was recently concluded in Los Angeles, the result being published very fully in this magazine last month. We refer to the St. John's Episcopal Church competition, participated in by five leading architectural firms of the Southern city.

Notes and Comments

The Architect and Advertising

Should architects advertise? This question is becoming a really serious one with the profession and the number who are disposed to answer it in the affirmative is increasing rapidly. But there is a decided difference of opinion as to just how this advertising shall be done. Newspaper and magazine display—no; very few architects in good standing are ready for such a radical step just yet, and it is to be hoped they never will be, for such publicity savors too much of the "quack doctor methods."

The day when the architect awaits the coming of a client in a comfortable swivel chair has passed. Clients these days do not seek the architect, as a rule. On the other hand the architect must seek the client if he intends to keep his draftsmen busy. And this brings up the question of just how and under what circumstances the architect should offer his services. If he goes about it in a straight forward, business like manner he is not likely to make an unfavorable impression, such as the following incident is said to have produced:

A big corporation was reported some time ago as being on the eve of starting a lot of building. The president happened to be a close friend of the writer, so told him of his architectural experience. Four architects called on him and tried by more or less subtle ways to persuade him into employing them. Seven wrote him—not business-like communications—a list of their important work, qualifications and that sort of thing, but the letters were meandering and pointless; were weak, half begging affairs; semi-social reminders of a church or lodge affiliation or some equally strong claim upon his attention. A dozen other architects were mentioned to him, one by the pastor of his church, several by club

friends, and others by business associates, feminine members of his household, and one by the janitor in his office building.

Now what do you suppose that man thought of the business tactics, the "approach" of the profession, its lack of stand-up, direct methods? He actually dreaded to leave his house in the morning, expecting to meet half a dozen architects' emissaries on his door step. It was his first "run-in" with the architects, and these men were clamoring to handle several million dollars of that company's money. What sort of handling could he expect them to give it?

* * *

The Architect as a Business Getter

The old notion that the profession is an art, and that any business method in its handling is a desecration, a profanation, is playing havoc with the business getting end of the profession. It's business-like to maintain an office, pay salaries and rent. Likewise it is business-like to keep tab on costs, make contracts and try and get work done at low figures. Then why is it not business-like or according to Hoyle of business to seek clients in a similarly business-like manner, legitimately and boldly, but not as a beggar asking alms?

* * *

Unfortunately many business men regard the architectural profession as constituting largely a cheap class of men. These business fellows never would think of asking three or four tailors to make them up suits of clothes in competition. Their natural procedure would be to order one suit and pay for it. But they have no compunction in asking a dozen architects to compete for the most trivial building project. One man told me, less than a week ago, that he had received twenty-six sketches for a $50,000 building and felt very magnanimous because he had paid out $150 in prizes.

* * *

The other morning on the train the writer got into conversation with a very successful builder of suburban houses. Some of these are really attractive, so I casually asked him who was his architect. Not knowing my business he grew confidential and assured me that securing architecture was a snap. When he got ready to build another house he let half a dozen "archeetecks" know about it and invariably received three or four sketches. A draftsman traced these off and the sketches would be returned as not suitable, the draftsman meanwhile planned the house and used whatever ideas, from the collection, he thought better than his own or the builder deemed available. Yes, and often the men whose sketches had been returned sent still others in the hope of getting that house to build. Pay an architect? Not he.

* * *

The writer has an architect in mind in San Francisco who never lacks good and profitable work. When he hears of a building project he sends an ad to the man—a letter telling him what his rates are, what work he has done, gives his bank and other references, solicits his business and encloses a list of buildings—important ones, too, most of which have been completed at within 3 per cent, one way or the other, of his estimates and with brief notes from the owners saying so. Now isn't that an infinitely more manly and business-like proceeding and a far stronger appeal to a business man than a procession of sisters-in-law or reverend and masonic friends coming to tell one how pleased they would be to have the job given to So-and-So because he is such a nice man!—The Observer.

Christian Science Churches

Architect Henry H. Gutterson, 278 Post street, San Francisco, is preparing plans for a $60,000 church for the Third Church of Christ, Scientist, Oakland.

Architect William Newman is preparing plans for a $30,000 church to be built on Oxford street, Berkeley, for the Second Church of Christ, Scientist. Mr. Newman has opened offices at 614 Grant building, San Francisco.

With the Architects

Building Reports and Personal Mention of Interest to the Profession

Architect George E. McCrea Busy

Architect George E. McCrea, 369 Pine street, San Francisco, has been commissioned to prepare plans for a church, parochial school and residence for Our Lady of Lourdes, at Lakeshore and Prospect avenues, Oakland, at a probable cost of $180,000. Other work in Mr. McCrea's office includes extensive alterations to the country house of Dr. George Herbert, near Watsonville; an eight-room rustic home at Carmel for Mr. Herman A. Spoehr, and a house at Santa Cruz for Mr. L. T. Bachman.

A. C. Blumenthal to Build

Mr. A. C. Blumenthal, well-known San Francisco real estate promoter, has commissioned Architect G. A. Lansburgh to prepare plans for two large apartment houses, one to be built on the northwest corner of Jackson and Laguna streets, having two hundred rooms, and the other to be erected on the southeast corner of Powell and Sacramento streets. Construction of both buildings, which will represent an investment of a million dollars, will be in charge of MacDonald & Kahn.

Eight-Story Apartment House

Plans are being prepared by Mr. E. A. Fritz, 116 Frederick street, San Francisco, for an eight-story steel frame reinforced concrete apartment house to be erected on the south side of California street, west of Mason, San Francisco, for Miss Laura I. Fritz. The building will contain apartments of from eight to twelve rooms each, and will cost in excess of $250,000.

To Design Country Bank

Architect James T. Narbett, Syndicate building, Oakland, has been commissioned to prepare plans for a one-story reinforced concrete bank building for the Calistoga National Bank, Napa county, to cost $35,000. Mr. Narbett has completed plans for a large residence in Alameda for Captain H. S. Pond and for the new Junior high school building in Richmond, the latter to cost $200,000.

O'Brien Bros. Busy

New work in the office of O'Brien Bros., 240 Montgomery street, San Francisco, includes a restaurant and dancing pavilion at Nineteenth avenue, near Sloat boulevard, for the Imperial Inn Company; a four-story reinforced concrete addition to a one-story building on O'Farrell street, near Jones, for Frank Kelley, and a two-story store and loft building on the north side of Sutter street, above Mason, for Messrs. Proctor & Chamberlain.

Government Hospital

Plans have been completed and bids are to be opened in San Francisco, April 10th, for the construction of a group of hospital buildings at Palo Alto, estimated to cost $1,400,000. The structures will replace temporary buildings comprising the U. S. Veterans' Hospital. The plans were prepared in the Supervising Architect's office, Treasury Department, Washington, D. C.

Salvation Army Building

Plans are being prepared by Architect Norman R. Coulter, Maskey building, San Francisco, for an eight-story territorial headquarters building for the Coast Division of the Salvation Army. A portion of the structure will also be used as a girls' home for the Army. The estimated cost of the improvements is $225,000.

Physicians' Building

A six-story steel frame concrete and brick office building, designed especially for rental to physicians and dentists, will be erected on the southeast corner of Sutter and Taylor streets, San Francisco, for Mr. J. S. Morgan. The plans are being prepared by Architect M. V. Politeo, First National Bank building, San Francisco.

Will Design High School Buildings

Architect William H .Weeks has been commissioned to prepare plans for a $500,000 group of school buildings for the Santa Barbara High School District and for a $200,000 high school building at Colusa for the Colusa Union High School District.

Clinton Lands Two Contracts

The Clinton Construction Company, 140 Townsend street, San Francisco, submitted the low bid for the main portion of the contract for the Aquarium building in Golden Gate Park, San Francisco, from plans by Architect Lewis P. Hobart. This firm was also the low bidder and has been awarded a contract for the construction of a twelve-story reinforced concrete office building at Eighth and Spring streets, Los Angeles, for the San Joaquin Valley Hotel Company. The contract price is $375,000.

Designing New Homes

Architect Henry H. Gutterson is preparing plans for several large homes to be built in St. Francis Wood, San Francisco's fashionable residence district. One of these houses is for Mr. Hart Weaver, automobile distributor, and the second house is for Mr. Paul K. Judson. They will cost about $20,000 each.

Test Highway

Preparations are being made to rebuild four sections of the test highway at Pittsburg, Contra Costa county. These sections have given way under the heavy traffic and must be rebuilt in order to complete the test of the remaining portion of the highway. Traffic will be resumed some time in April.

Masonic Home Addition

Plans have been completed by Mr. William Mooser, architect, and Mr. Edward G. Bolles, associate architect, of San Francisco, for extensive additions to the Masonic Home at Decoto, Alameda county. Bids are now being received from various sub-contractors. There is an appropriation of $300,000 for the work.

Architect to Build

Mr. Ira W. Hoover, whose residence is at Planada, near Merced, is preparing plans for a country house to be built at Planada for Mr. Byron Warner, an Eastern architect, who intends to spend a portion of his time in California.

Ukiah Grammar School

The citizens of Ukiah have voted $80,000 in bond money for a new grammar school, and Architect Norman R. Coulter has been commissioned to prepare plans for a reinforced concrete building of eight rooms and assembly hall.

Store and Office Building

A large store and office building is to be constructed at Taft, Kern county, from plans prepared by Architect Chas. H. Biggar of Bakersfield.

Littlefield Secures Two Contracts

Mr. R. W. Littlefield, Oakland contractor, has been awarded the contract to build the new Pacific Gas & Electric Company's building in Oakland for $318,500. Mr. Littlefield also has the contract to build the new Haynes Garage at Fourteenth and Harrison streets, Oakland, from plans by Architects Meyer & Johnson of San Francisco. Mr. W. L. Kelly, formerly with Palmer & Petersen, is now connected with the Littlefield staff.

Applied Mechanics—Reinforced Concrete

Evening classes for the study of Applied Mechanics and Reinforced Concrete construction are to be held in San Francisco under the direction of Mr. Harry W. Bolin of the H. J. Brunnier Company. The course will be for architects, engineers, draftsmen and others technically qualified. The classes will be held in Room 266, Pacific building, San Francisco.

San Mateo Amusement Park

Plans are being prepared by Architects Kuhn & Edwards, Commercial building, San Francisco, for the new "Pacific City," an amusement resort to be built along the waterfront of San Mateo. There will be a large bathhouse, dancing pavilion, skating rink, restaurant, stadium, etc.

School Buildings at Taft

Architect Orville L. Clark of Bakersfield is preparing plans for a number of new school buildings to be built under a bond issue at Taft, Kern county. These will include a gymnasium, swimming pool, domestic science and arts building and shops.

Apartments and Flats

Mr. H. C. Baumann, 251 Kearny street, San Francisco, has completed plans for a two-story frame apartment house to be built on 13th avenue, between Geary and Clement streets, San Francisco, for Mr. John Schroeder.

School Building at Auburn

Messrs. James S. & Chas. Dean, 1351 40th street, Sacramento, have been commissioned to prepare plans for a new $100,000 high school building for the Placer Union High School District at Auburn.

Los Angeles Building

Architect S. Heiman, 57 Post street, San Francisco, has been commissioned to prepare plans for a commercial building on Hill street, near Seventh, Los Angeles, for the Dunn-Williams Company of San Francisco, at a cost of $200,000.

Mr. Glass Explains

Editor The Architect & Engineer, San Francisco:

Some time ago certain advertising matter appeared in the San Francisco Chronicle to which was attached a reading notice referring to the activities of the firm of Glass & Butner, architects, of which Mr. Edward Glass was then a member. The matter contained in the reading notice caused much unfavorable comment by reason of certain criticism contained therein, and also because a non-certificated architect was apparently mentioned as an associate of the firm.

The following copy of a letter addressed to the board and signed by Mr. Glass is self-explanatory as to the foregoing, and we trust that in justice to Mr. Glass and the State Board of Architecture that this letter will be given the fullest publication.

"February 18, 1922.

State Board of Architecture, Phelan Building, San Francisco.

GENTLEMEN:

Referring to the publication of an item in the San Francisco Chronicle purporting to be an interview with me regarding the work of the firm of Glass & Butner, and which was called to my attention by the Board, I desire to state that the subject matter as it appeared in print was entirely at variance with the data given by me, and was not approved or sanctioned by me or by any other person acting for me.

Yours very truly,
(Signed) EDWARD GLASS."

STATE BOARD OF ARCHITECTURE, NORTHERN DISTRICT.
By SYLVAIN SCHNAITTACHER, Secretary.

Open Engineering Office

Mr. D. S. Reynolds, formerly representative in San Francisco and Los Angeles for the Dunham Co., and Mr. A. M. Hubbard, for some time representative for the D. S. Sturtevant Co., have opened an office at 528 Title Insurance building, Los Angeles, as heating and ventilating engineers. They have commissions from the Los Angeles Board of Education for laying out the heating systems for three new school buildings.

Architect to Build Home

Architect Joseph L. Stewart of San Francisco has completed plans for a $20,000 home in St. Francis Wood. Monson Bros. will be in charge of construction.

Contractors Move

C. L. Wold Co., general contractors, of San Francisco, announce the removal of their offices to rooms 319-321 at 185 Stevenson street. Their phone number is Sutter 4971.

Paso Robles Apartments

Messrs. Miller & Warnecke are preparing plans for a two-story brick store and apartment house for Mr. Clark Smith of Paso Robles.

Will Continue Open Shop Plan

Under date of February 23, the Pacific Manufacturing Co., manufacturers of millwork, sash and doors, announced that its factory at Santa Clara was gradually nearing full production again after having adopted in January the American plan of operation, which resulted in the necessity for rebuilding its organization. The declaration in favor of industrial freedom was made by the company on January 21, the workmen retaliating by refusing to return to the factory, although many had been employed in the plant for years. The company states that under no circumstances will it return to closed-shop conditions.

Fresno Wants Sugar Pine Mill

Fresno is making an effort to secure a new mill of the Sugar Pine Lumber Co. which it is estimated will cost $5,000,000 and employ 2000 men. The company has had its home at Madera for the last 25 years and that town has offered $100,000 cash and land bringing the total offer up to nearly $1,000,000 to secure the plant.

Passing of Los Angeles Engineer

Mr. Karl D. Schwendener, for more than eight years engineer in the Los Angeles city building department, and later practicing architect and engineer, died January 22 at his home in Glendale of pneumonia. He had been ill about ten days. Mr. Schwendener was 35 years of age.

Second Unit to Southern Pacific Building

A second unit is to be built soon to the Southern Pacific terminal warehouse, at Berry and Townsend streets, San Francisco. Leases are now being closed with a number of wholesale firms. Approximately $2,000,000 will be expended. Bliss & Faville are the architects.

Joint Meeting

The California State Board of Architecture, Northern and Southern Division, will hold a joint meeting in Los Angeles April 6th. The two Chapters, A. I. A., will also meet in the Southern city early next month.

$500,000 Office Building

Mr. A. H. Albertson, Henry building, Seattle, is the architect for a six-story, $500,000 building to be erected at the corner of Fifth avenue and Union street by the Metropolitan Building Company.

Personal

MR. EDGAR W. MAYBURY is now associate member of the firm of Sylvanus B. Marston and Garrett B. Van Pelt, Jr., architects, Chamber of Commerce building, Pasadena.

Chapter Members to Design Schools

The Washington State Chapter, A. I. A., at its February meeting received a report from a special committee on school buildings. Following a request from Mrs. Josephine Preston, State Superintendent of Schools, that the chapter advise with the State Superintendent of Education with reference to school buildings throughout the State, the following recommendations were made:

(1) The chapter to institute a competition among members for one and two room school buildings; (2) Working drawings of the above to be sold; (3) List of chapter members to be distributed throughout the State to the county superintendents. The selection of architects for school buildings to be made from these lists. (4) That the chapter form a special committee to criticize school plans, as such inspection is now required by law and requested of the chapter by Mrs. Preston.

Seattle Architectural Exhibition

The Washington State Chapter, A. I. A., will hold an Architectural Exhibition in the galleries of the Seattle Fine Arts Society, 1213 Fourth avenue, Seattle, Washington, from April 2 to May 1, 1922. All members of the chapter are requested to send in drawings and photographs of buildings already erected or in project, details, perspectives, sculpture, wood carving, models, metal work, pottery, furniture, etc.

A jury will select twelve or more of the best buildings for publication in the May number of the San Francisco Architect and Engineer.

Address all correspondence regarding the exhibition to Mr. J. S. Cote, 621 Lyon building, Seattle, Wash.

Landscape Architect Busy

Emerson Knight, landscape architect, is preparing plans for the garden of Mrs. H. B. Allen, 290 Sea Cliff avenue, San Francisco. Also for the landscape treatment of a group of 17 houses for L. D. Allen & Co. as an addition to the development scheme of Windsor terrace, San Francisco. Mr. Knight will continue the landscape development of the Merle B. Moon estate at Saratoga, and he is also preparing planting plans for Allen & Co. for a group of three homes on Lake street, between 29th and 30th streets, San Francisco.

Form Partnership

Mr. Kenneth MacDonald, Jr., and Mr. Maurice C. Comchot announce their association as architects, engineers and managers of construction, 234 Pine street, San Francisco.

Los Angeles Chapter Committees

President Sumner Hunt of Southern California Chapter, A. I. A., has appointed standing committees to serve during the year 1922 as follows:

Institute and Chapter Affairs Committee—Edwin Bergstrom, chairman; Robert H. Orr, secretary; John P. Krempel, Octavius Morgan and H. M. Patterson.

Ethics and Practice Committee—A. M. Edelman, chairman; S. Tilden Norton, secretary; Harwood Hewitt, James E. Allison and Robert D. Farquhar.

Education and Publicity Committee—David C. Allison, chairman; Fitch H. Haskell, secretary; Myron Hunt, W. J. Dodd and S. M. Spaulding.

Membership Committee—Charles F. Plummer, chairman; R. Germain Hubby, secretary; T. Beverly Keim Jr., Wm. F. Staunton Jr., and Frank Hudson.

Public Service Committee—Alfred W. Rae, chairman; Henry F. Withey, secretary; J. J. Backus, David J. Witmer and O. W. Morgan.

Affiliated Societies and Allied Arts Committee—Clarence E. Noerenberg, chairman; Wm. M. Clarke, secretary; H. C. Chambers, Pierpont Davis and Wm. Richards.

Board of Mechanical Engineers—O. W. Morgan, chairman; Clarence E. Noerenberg.

Committee to Represent Chapter on City Planning—(Traffic Conference)—Clarence E. Noerenberg.

Contractor Cannot Recover Architect's Fees

That a contractor cannot recover an amount claimed to be due him for services rendered as an architect was decided by Superior Judge A. W. Frater of Seattle, recently, in the case of L. H. Osterud vs. W. E. Howard.

Suit was instituted by the plaintiff and the recovery of $91.40 claimed to be due for certain repairs and alterations, asked. This amount was allowed by Judge Frater. In addition, however, the plaintiff demanded $398 "for professional services as architect in preparing plans and specifications."

This claim was rejected by the court because of the State license law which prohibits other than a licensed architect from practicing architecture. The $398 asked by plaintiff was 5 per cent of the estimated cost of the work contemplated.

Opens Los Angeles Office

Mr. Wm. A. Larkins, a prominent building contractor of Salt Lake City, has moved to Los Angeles, where he has opened an office at 325 Title Insurance building. Mr. Larkins was for a number of years with the Thompson-Starritt Company when that organization operated in San Francisco.

Odd Fellows' Building

Mr. Ernest Kroner, architect, 430 Worcester building, Portland, is preparing plans for a $200,000 lodge and office building for the Odd Fellows.

It will be 100 feet square, six stories, steel frame construction with brick and terra cotta front.

With the Engineers

Reports from the Various Pacific Coast Societies, Personal Mention, Etc.

A Code of Ethics

"One of the distinguishing characteristics of a profession is its code of ethics, its sense of propriety and of honor," says Mr. H. O. Garman, calling attention to this code of the American Association of Engineers, of which he is president.

Any code of ethics must be predicated upon the basic principles of truth and honesty. "Whatosever things are true, whatsoever things are honest," are the things for which engineers must contend.

An engineer may not "go beyond and defraud his brother" by any underhanded act or method. He may not do or say anything that will injure his brother's reputation, or his business, for the purpose of securing his own advancement or profit. This admonition carries with it no obligation to refrain from telling the known and absolute truth about an unworthy brother, as a protection to others; but the truth so told must be such as can be substantiated, and he who tells it must have the courage which will not shrink from the consequence of his telling.

An engineer owes his client allegiance demanding his most conscientious service. But conscientious service to the client must never entail a surrender of personal convictions of truth and right.

An engineer who receives compensation from an employer may not receive gift, commission, or remuneration of any kind from a third party with whom he does business for that employer.

An engineer seeking to build up his business may not resort to self-laudation in advertising. He may state briefly the lines of work in which he has had experience, and enumerate responsible positions which he has held and give his references.

An engineer who employs others, either in his own service or in that of the client who employs him, should recognize in his relationship to them an obligation of exemplary conduct, of helpfulness and personal interest in those with whom he is thusly brought in contact, and he should discharge such obligation tactfully and kindly.

The honor of the profession should be dear to every engineer, and he should remember that his own character and conduct reflect honor, or the reverse upon the profession.

If, then, he so lives that his own honor shall never be smirched by his own act or omission, he will thus maintain the honor of the organization to which he belongs.

Says Registration Laws Aid Engineers Practice

"Engineering structures already receive much publicity, but the poor shrinking violet of an engineer is usually accorded but scanty recognition," said Mr. R. W. Crum, engineer of materials and tests, Iowa State Highway Commission, at the Conference on Public Information held by the American Association of Highway Engineers. "When the record-breaking achievement of a new waterworks system is completed, the speeches at the banquet are made by the local banker, dry goods merchant and secretary of the commercial club, but the engineer who designed and executed the job is lucky if he gets in on the feed. This is no one's fault but our own; we can as easily inform the public upon our connection with the work as can the promoters. The only difference is that they do it and we do not.

"For many years such public education has been sadly handicapped by the broadness of the term 'engineering' in the public mind. It is extremely difficult to give a man the definite impression we wish, when the term covers in his mind locomotive engineers, bricklayers, the boy that holds the rod, and the president of the Pennsylvania railroad.

"The first thing needed is a definite legal status and legal standard for professional engineers. I, therefore, recommend a concerted effort to secure the passage of registration laws in those States not now having them. Such laws are of great value in restricting practice to competent engineers, but from the publicity standpoint the legal standing and definition given the profession are invaluable. It will also be found that an intensive local publicity campaign will aid greatly in getting these laws upon the statute books."

General Goethals Visits Coast

General George W. Goethals, New York engineer and builder of the Panama Canal, recently visited San Francisco and other coast cities. General Goethals emphatically denied reports that he has been retained by the San Joaquin Light and Power Company to supervise $40,000,000 worth of engineering. He declined to discuss the feasibility of bridging San Francisco bay.

Decision Outlaws Open Competition Plan

New American business methods and the probable development of large industrial combinations may result from the United States Supreme Court's decision on "open price" associations, is the opinion of The Bank of America, New York, expressed in a pamphlet recently published, and which contains the full text of the majority and dissenting opinions of the Supreme Court in the case involving the American Hardwood Manufacturers' Association.

"The decision of the United States Supreme Court in the case of the American Hardwood Manufacturers' Association, which in effect outlaws the 'open competition plan,' is one of the most important governmental actions in the history of American business," declares The Bank of America in commenting on the case. "The 'open competition plan,' as it is now practiced, will have to be radically revised and probably associations using it will reorganize within the limitations indicated by the Supreme Court's verdict. If this decision results in disintegrating trade organizations, which in a large number of cases it probably will, other agencies will have to take their place in performing essential business functions. It may be that the statistical and information activities of the 'open price' associations will be continued under the supervision of a governmental agency like the Department of Justice.

"New selling and distributing methods may be devised to meet new types of competition. Manufacturers will cooperate in new organizations to carry on constructive public education, to eliminate wasteful practices, to strengthen foreign trade.

"This decision, together with other contemporary economic influences, will undoubtedly result in the development of larger industrial aggregations through mergers and combinations. The direct effect of such conditions may even be more powerful than any under the 'open competition plan.'"

As this decision is of far-reaching influence and interest, the demand for reprints of the text has been large. A copy of the pamphlet will be sent on request by The Bank of America, 44 Wall street, New York.

Fighting Floods With "Sausages"

Fighting storms with "sausages" is an effective method the California Highway Commission has tried out this winter in Southern California.

The "sausages," however, are not of the "fido" kind, but consist of dykes constructed of heavy steel mesh wire and filled with heavy rock. These dykes the workmen have dubbed "sausages." They are proving to be an effective method of combatting streams swollen to torrential proportions that threaten the State highway system.

Useful Data

A cubic foot of lump lime weighs from 60 to 70 pounds.

A 200-pound barrel of lime contains 180 pounds net of lump lime, or 3.1 cubic feet.

A 300-pound barrel of lime contains 280 pounds net of lump lime, or 4.7 cubic feet.

A bushel of lime contains 60 to 80 pounds, or 1 to 1.3 cubic feet, depending on the state laws.

A pound of magnesium lime requires about one pound of water to form a paste, or about 25 gallons a barrel.

A barrel of lump lime gives from 6 to 9 cubic feet of paste; average about 7½ cubic feet.

A cubic foot of hydrated lime weighs from 30 to 45 pounds, average about 38 pounds.

A small sack of hydrated lime contains 40 pounds, or 1 cubic foot.

A standard sack of hydrated lime contains 50 pounds, or 1¼ cubic feet.

A large sack of hydrated lime contains 100 pounds, or 2½ cubic feet.

Hydrated lime requires about an equal weight of water to produce a paste. A 100-pound sack of hydrate gives about 2.3 cubic feet of paste.

A standard barrel of Portland cement weighs 376 pounds net and contains 3.8 cubic feet.

A sack of Portland cement weighs 94 pounds and contains about one cubic foot. It is usually considered as 100 pounds.

Cement paste weighs about 137 pounds per cubic foot.

One cubic foot of Portland cement will yield 8 cubic feet of paste.

The average wooden wheelborrow load of broken stone is about 2.4 cubic feet.

The average wheelborrow load of sand is about 2½ cubic feet.—Ex.

Death of J. S. Bogart

Mr. J. S. Bogart, a widely known construction engineer, passed away February 23 at his residence on the Alviso road, two miles north of Santa Clara, from pneumonia, following an attack of influenza. Mr. Bogart was a native of New York and was in his 45th year. He came to California 23 years ago, and for several years past practiced his profession in San Francisco, with offices in the Mills building. Mr. Bogart was in charge of construction of the Shredded Wheat plant in Oakland and the Beach-Nut factory in San Jose. He was a member of the Masonic order in San Francisco, also the Olympic Club, the Country Club and the Elks' lodge.

The Contractor

BUILDING CONSTRUCTION, BRIDGES AND ROAD WORK

Does the Constructor's Profession Lack Idealism?*

By J. B. WARRACK

THE subject of my talk only came to me yesterday after a brain-racking week of thought and feverish hunt for a timely topic. It was revealed through a chance meeting with a business acquaintance whom I had asked for a suggestion as to a proper subject for an address to the Builders' Association. He said, "Oh, talk about 'how to skin a job,' or 'gram a dollar'; those men have no other ideas —they have no ideals!"

I thought this over; have we no ideals? Are we just ordinary money-grabbers? At last I had a subject for my talk.

"Does the Constructor's Profession Lack Idealism?"

I will endeavor to acquaint you with these few thoughts on the subject, born only a few hours ago, and sincerely hope you will find some good in them, but I fear you will have to accept your position with resignation as the Swedish bridegroom did when the minister said, "Ole, do you take this woman Hilda Sorgenson for your wedded wife, for better or for worse?" Ole replied, sadly, "Oh, well, aye tank aye get lettle bit of both." And that is probably what you will get in my talk this evening, a little bit of both.

The constructor by his experience and technical knowledge is well prepared to enter into public discussion, and should do so. To that end constructors (builders-contractors) should be members of local associations, devoted not only to the consideration of the technical points of the profession, but to the far more noble service to the community; that of being a co-operative part in public affairs.

In spite of the necessity of long hours in the office or on the job, studying, estimating and analyzing costs, the constructor must needs find time for the consideration of broader interests.

The lawyer, whose work brings him into contact with the people, has the advantage of public prominence which too often leads to his appointment on commissions of a technical nature which could have been filled more ably by a constructor. The doctors have long impressed the people with their value to the community in a public way—the engineers and architects have also (more recently, however) gained the well merited recognition of the public, and now it is the constructors, newly awakened, who are seen emerging from their cocoons, so to speak, to profit by the example of other professions and be of great public service to their communities.

We often read in the periodicals and daily papers the rantings of reformers, the sermons of the clergy and the songs of poets, exhorting men to lead a life of self-sacrifice, humility and service, and I say to you, with all respect to these men, that nowhere in this country will you find men who are more self-sacrificing, more humble or more willing to be of service to their fellow men, than these, your brothers in the profession—the builders.

What the thoughts of these men are will be found in the minutes of the meetings and in the recorded proceedings of their conventions. Let me read what some of them say in the records of the Northwest Master Builders' Association Convention at Seattle in 1919, and judge whether or not they lack in idealism:

Chapter 9 of the declaration of principles adopted by the association as being prepared by a committee of builders:

"We believe that man renders the greatest social service who so co-operates in the organization of industry as to afford to the largest number of men the greatest opportunity for self-development and the enjoyment by every man of those benefits which his own work adds to the wealth of civilization."

And hear what John Chalmers has to say with regard to the training of the American boy to take the place of our foreign-born mechanics:

"That if the American boy is given the opportunity that he should be given, we will be assured that there will be no better mechanic in the world than our American boy, and we will not need to import mechanics from Europe or any other place to do the building of this great city or of the great cities of the United States. It is up to us to see that our boys get the opportunity."

*Address delivered before the Seattle Master Builders' Association, November 15, 1921.

And here is a quotation from a speech delivered by Thos. Streiff, a Tacoma builder:

"A composition for cheapness, and not for excellence of workmanship, is the most frequent and certain cause of the rapid decay and entire destruction of arts and manufacture."

Carl Lohman, a Seattle builder, said:

"Finally, become a master builder in fact; eliminate the blind plunge; accept responsibility; be prepared and show your capacity by programming your work."

Listen to the strong admonition of H. C. Bromley of the Hull Building Company, Seattle:

"Now if you are going to be successful in this organization, you have got to be honest. If you are not honest you will fail. You have got to be honest with yourself; you have got to be honest with your sub-contractor and your employes."

O. G. Hughson of Portland, said:

"The only cause worth while in the long run is the interest of the general public. The only ideal worthy of consideration is our supreme best in workmanship, in method and in quality service. The true spirit of an organization that places personal honor above selfish interest finds its truest expression in serving the public. The reactionary profit of this attitude has been foreordained to be greater by far than results from selfish, one man, go it alone direct action."

And finally, that distinguished constructor of Seattle, W. T. Butler, of the Butler Construction Company, said in a speech to the assembled builders:

"Do not forget that each man should know himself, should know his cost, should know his ability. He should play the game straight; be fair to the owner and the mechanic and the architect and to the engineer, and thus gain the confidence of all. Do not expect to get rich on one contract, but look to the future. The satisfied owner is most times worth more than the profit."

The constructor's profession and the construction business is far from being destructive of idealism.

Consider the building of the pyramids of Gizeh over 5000 years ago, built of granite blocks, five feet square and thirty feet long; the temples of the ancients, some of which still withstand the ravages of time—that famous roadway from Rome to Capua, the Appian Way, which is still in use after 2000 years.

Consider the hardworking monks of the twelfth century who toiled from sun-up to sun-down erecting bridges, buildings and roads; they saw more clearly than do many of this day the relationship between the path of industry and communication and the spread of knowledge.

Take the massive dams built by the constructors of this generation, which store the pure water of the mountain slopes after years of waste, the railroads built by hardy constructors who laid the steel so that the East and West might be linked inseparably together, the bridges which connect communities and hasten travel, the buildings which house the sick and wounded, the towering skyscrapers, houses of worship, factories, warehouses, hotels, theaters and others—what constructor—what builder has not been stirred by the romance of his profession?

Consider the men in our organization, yes, the men in this room, if you will, who rebuilt the city after the great conflagration of 1889—the men who built the fair buildings—the beautiful capitol buildings at Olympia, under most trying conditions—the men who stuck to the job and finished grand structures after facing financial ruin—the men who journeyed to far cities and built monuments to the ability of the constructors of the Northwest in Montana, Idaho, Oregon, California, Alaska, Iowa and far off Tennessee.

The men who built government cantonments, bettered housing conditions during the war; who moved a concrete school building through the streets of San Francisco so that room might be had for a more noble edifice; who built the Washington stadium, the Roosevelt high school, and thousands of the best constructed buildings in this section, are the men, gentlemen, who do things—men of deeds, not words—men of action—and who can say that THEY lack idealism?

No Limit on Productive Capacity of Individual Workmen

The international organization of bricklayers, masons and plasterers, comprised of 100,000 members of this union in all parts of the country, has agreed to the following basic principles to apply in construction work:

1—There is to be no limit to the productive capacity of the individual workman within the working day or any other given time.

2—There is to be no limit upon the right of the employer to purchase his materials wherever and whenever he may choose, whether those materials be union made or otherwise.

3—There is to be no favoritism shown by organized labor toward employers or trade associations or contractors' associations and no discriminations are to be indulged in against the independent employer who may not be a member of such an association.

4—The labor organization is not to be used or to permit itself to be used by material men or contractors as an instrument for the collection of debts or enforcement of the payment of alleged claims.

"One Room into Many, Many into One"

as applied in the Lafayette Presbyterian Church, Buffalo, N. Y.
Clark & Arms, Architects

WILSON

Standard for Forty-Five Years

Folding and Rolling Partitions

FOR CHURCHES, SCHOOLS, OFFICES, Y. M. C. A BUILDINGS, HOTELS, CLUBS AND OTHER PUBLIC INSTITUTIONS

For easy and instant subdivision of large rooms Wilson Partitions are standard. Prices have been reduced as much as possible.

Wilson Sectionfold Partitions are made to harmonize perfectly with interior decoration, new or old. Have every appearance and advantage of solid, permanent wall, yet at will disappearing, folding into small space, practically out of sight.

Presbyterian Church
Broad and Vernango Sts., Philadelphia

Wilson Rolling Partitions are lower in price than Wilson Sectionfold Partitions. Used where decorative adaptability and permanent appearance of the Folding Partitions are not so important. Their practical advantages have placed them in more than 38,000 churches, schools and public institutions.

Write for details of Folding and Rolling Partitions or any of the Wilson products. Wilson details and specifications in Sweet's Catalogues.

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Salt Lake City

Comparative Installation Costs of Concrete and Corrugated Pipe on Three State Highway Jobs

THAT the labor costs for hauling and placing corrugated pipe are considerably less than those in connection with reinforced concrete is perfectly obvious from a comparison of weights per foot of the two types; but just how wide the difference is has been a matter of conjecture, since definite figures were lacking. The weights, according to California Highway Commission standards, are as follows:

Diameter	Corrugated Pipe. Wt. per ft.	Reinforced Concrete Pipe. Wt. per ft.
12"	10.8 lbs.	90 lbs.
18"	15.7 lbs.	146 lbs.
24"	20.7 lbs.	200 lbs.
30"	31.9 lbs.	355 lbs.
36"	38.1 lbs.	507 lbs.

Figures just at hand in connection with three recent state highway grading contracts throw quite a little light on the matter of installation costs. Bids were called for on an alternate basis, the pipe to be either corrugated iron or concrete, according to later decision of the commission. The Highway Commission was to supply the pipe in either case, and deliver it to the railroad station nearest the work, so the calculations of the contractors were confined to hauling, installing and back-filling. The figures of the successful bidders were as follows:

6.1 miles of highway in Santa Barbara county, between Cuyumaca river and Buckhorn creek. The Warren Construction Co., successful bidders.

Cost of Installing Per Foot

Diameter	No. Feet	Concrete	Corrugated Iron
12"	1,004	$1.75	$ .75
18"	1,662	2.50	1.00
24"	428	3.00	1.25
36"	132	5.00	2.00

5.7 miles in Mariposa county, between Sierra National Forest and Brickeburg. Rhodes & Price, successful bidders.

Diameter	No. Feet	Concrete	Corrugated Iron
12"	1,232	$2.00	$ .80
18"	550	2.50	1.00
24"	300	3.50	1.20
30"	682	5.00	1.30

16.8 miles in Santa Clara county, between San Felipe and eastern boundary. Rhodes & Price, successful bidders.

Diameter	No. Feet	Concrete	Corrugated Iron
12"	2,120	$2.00	$ .70
15"	816	2.50	.75
18"	840	3.00	.80
24"	498	4.00	.90

These jobs ran from $150,000 to $400,000 each, and many contractors bid on each of them. The figures of the successful bidders may therefore be considered fairly indicative.

Union Workmen to Be Penalized

THE Associated General Contractors of America, The American Institute of Architects, The Engineering Council, The National Building Trades Employers' Association, and the Building Trades Department of the American Federation of Labor, through the National Board for Jurisdictional Awards, which recently concluded its regular quarterly meeting in Washington, have reached a national agreement through a resolution heavily penalizing union workmen who refuse to abide by the decisions of the board.

The resolution provides that local building trade councils of union labor shall suspend unions and refuse to recognize or support those unions which decline to abide by decisions of the National Board; it also provides that general contractors and sub-contractors who employ only union labor shall incorporate in their agreements with labor a provision that will secure compliance with all the decisions of the board, and that they shall refuse employment to members of local unions which do not abide by such decisions, and further, that architects and engineers shall insert in all their specifications and contracts a clause that such decisions shall be followed.

This resolution is of far-reaching consequence to settle these jurisdictional disputes, which in the past have constituted the majority of the causes for strikes and resulting delays and economic losses.

It is the most effective co-operation between workmen, employers and professional men interested in construction looking toward the settlement of these jurisdictional disputes without resort to strikes.

This action has been taken as the result of the report of a special committee of the National Board appointed to outline the procedure to be followed in clearing up the situation created by the refusal of the United Brotherhood of Carpenters and Joiners to conform to the decisions of the board in the case of settling the dispute between the carpenters and the sheetmetal workers which was decided in favor of the latter. This dispute involved the setting of sheetmetal trim on doors and windows. The carpenters have refused to abide by the decisions and have called strikes and suspended work on big construction jobs in many parts of the country, causing serious trouble and unemployment in other trades.

The resolution follows:

Whereas, The United Brotherhood of Carpenters and Joiners of America has not been observing or conforming to the decisions of the National Board of Jurisdictional Awards in the building industry; and

A·F·B·A
USE FACE BRICK
—It Pays

Entrance Detail, Bohemian Club, San Francisco. George W. Kelham, Architect

A charming bit of renaissance in which the light-colored, smooth brick admirably harmonize with the terra cotta trim, producing an effect of clean and simple elegance. The pattern work in the attic story is delightfully designed and treated.

THE Bohemian Club Entrance is one of the thirty-two subjects illustrated in our Portfolio of Architectural Details in Brickwork, a collection of file-size, de luxe half-tone plates, assembled in an enclosed folder, with printed tab, ready for filing.

These examples show a wide variety of artistic effects, in both interior and exterior subjects, that can be economically obtained by the use of standard brick. Where special brick are wanted we suggest that the architect lay out the wall so that the special forms may be made from standard sizes. In this way he will secure the effect he desires at the least expense.

The Portfolio of Architectural Details in Brickwork will be added to from time to time, with further examples, with data on brick and its uses, and with monographs on the treatment of the mortar joint in connection with the blending of the brick color tones.

The portfolio will be sent to any architect requesting it on his office stationery, and his name will be placed on the list for future mailings.

AMERICAN FACE BRICK ASSOCIATION

1159 WESTMINSTER BUILDING · CHICAGO, ILLINOIS

Whereas, The attitude of that organization in failing to observe those decisions is seriously embarrassing owners, architects, engineers, contractors and workmen engaged in the building industry, and such a condition tends to increase costs and to cause delay and is detrimental to the public interest and the building industry in general; and

Whereas, All parties signatory to the plan of the Jurisdictional Board have been actively supporting the decisions of that board, including sixteen of the seventeen international unions constituting the Building Trades Department at the inception of the board.

Resolved, That in order to correct the above mentioned conditions, the several signatories to the plan of this board be urged to instruct their constituent members, each in its respective field as follows:

That the members of the American Institute of Architects and of the Federated American Engineering Societies insert in all specifications and contracts for building operations a stipulation that the decisions of the Jurisdictional Board shall be observed;

That the members of the Associated General Contractors and of the Ntaional Association of Building Trades Employers incorporate in their agreements with their sub-contractors a provision that will secure a compliance with all decisions of the Jurisdictional Board and that the members thereof shall refuse employment to any local union or members thereof neglecting or refusing to abide by decisions of the Jurisdictional Board;

That the Building Trades Department shall instruct local councils to unseat any local union refusing compliance with such decisions, and that associated international unions shall instruct their respective locals to extend neither recognition nor support until such time as delinquent locals accept and abide by all decisions of the Jurisdictional Board.

Resolved further. That this resolution shall be enforced as expeditiously as possible beginning with those localities in which the trouble appears to be most acute and where action seems most urgent, and that all these signatories make special and united efforts toward securing general and complete compliance with all the decisions of the Jurisdictional Board; and

Resolved, also, That as and when trouble in any locality is brought to the attention of any of the signatories such organization shall take the initiative in forming a general committee of representatives from all the signatories for the purpose of dealing with the situation in that locality.

Of the seventeen international unions that constitute the Building Trades Department of the American Federation of Labor, sixteen have unqualifiedly endorsed the work of the board and supported its decisions. The carpenters' union alone, although one of the original organizers of the board, now refuses to support it. As a result they have been suspended from the Building Trades Department of the American Federation of Labor, and been outlawed by every building trade council and the leading organizations of general contractors, sub-contractors, engineers and architects in the country.

Principles of the Associated General Contractors of America

The following postulations introduce the program's main objectives:

A principle is a standard by which men live.

A program is the means of putting a principle into effect.

A principle without a program is a platitude.

Co-operation is the standard that gives life to associations of men. Is it a blithering platitude, or is it an effective principle?

There is just one test: has it an effective program?

The Present Program of the Associated General Contractors of America includes the following main objectives:

Co-operate with Associations of Engineers, Architects, Manufacturers, Dealers, Bankers, Realtors, Sub-contractors, and Workmen in the solution of common problems.

Maintain the National Board for Jurisdictional Awards in the Building Industry.

Organize a National Conference Board for the Building Industry representing contractors, workmen, architects, engineers, and owners to consider working conditions, establish national standards, remove restrictions, and eliminate strikes.

Promote the organization of official and voluntary Boards of Arbitration of disputes.

Put in operation the procedure for Payment for Estimating and Quantity Survey, recommended by the joint report of A. G. C., American Engineers Council, and American Institute of Architects.

Formulate Standard Estimating Forms for builders and highway contractors.

Develop a System of Money Accounting for contractors.

Standardize Construction Cost Accounting Practices, such as equipment rental schedules.

Secure necessary amendments to existing Standard Contract Forms and formulate others as needed, for use between Contractor and (a) Owner, on lump sum, unit price, cost plus work in building, highway, railroad, and public work construction; between Contractor and (b) Subcontractor, (c) Material Manufacturer, and (d) Equipment Manufacturer.

Revise, systematize and standardize Compensation Insurance Classification and Rates.

You would accept a certified check

Look for this Blue and Gold Armco Label on Washing Machines, Stoves, Ranges, Refrigerators, Enamel Table Tops, and other household and commercial utilities. It carries with it the assurance of the quality and solid worth of the sheet metal parts of articles that bear it.

WHEN you buy a stove, a washing machine, a refrigerator or other household article, and it is stamped with the maker's name *and in addition has the Armco triangle,* you know it is as good as a signed, certified check.

The Armco triangle appears only on articles of full value, of more than ordinary merit. Manufacturers couldn't afford to use "Armco" Ingot Iron in cheap articles.

This pure iron resists rust. Because of its especially prepared surface it takes a coat of enameling with a rich gloss that is beautiful in appearance, easy to keep clean, and which has no tendency to crack or chip. Galvanizing holds to "Armco" Ingot Iron—or it is more true to say that the galvanizing and the pure iron base become as one.

Whenever you buy a stove, a washing machine, a refrigerator, or other household utility, ask the salesman to let you see the Armco trademark. It is certifying our signature to the "check."

THE AMERICAN ROLLING MILL CO.
MIDDLETOWN, OHIO

An ample supply of ARMCO stock is carried in the San Francisco warehouse, Tenth and Bryant streets. Other branch offices in New York, Pittsburg, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, Washington and Buffalo.

Develop the Contractors' Service Corporation as a service bureau representing contractors on insurance rates, coverage, and service; establish local branches.

Secure passage of National Legislation, as follows:

Navy, War, Treasury Contractors' Relief Bills,

Department of Public Works Bill,

A Scientific Selective Immigration Law,

Adequate, Federal Aid for Highways,

An effective Water-power Development Act,

Proper Railroad Regulation including: (a) Maintenance of private ownership, (b) curtailment of Interstate Commerce Commission's arbitrary power to grant priorities, (c) modification of wartime freight rates on construction materials, (d) adequate support of railroad expansion.

Standardization of Government Contracts, Jt. Res.

Secure an Open Wholesale Market in materials

Urge Fall Lettings of highway and public works contracts.

Seek the Standardization of Building Codes.

Encourage Associations of General Contractors in the solution of problems of mutual interest.

Maintain a Research Division for the study of contractors' problems.

Give accurate Information and Statistics on construction through regular publications, bulletins, and pamphlets.

Neglect of Concrete Mixers Is Costly

Mixer manufacturers report that only one of five paving mixers returned at the season's end to be overhauled shows that it has had reasonable care in the operation and maintenance. Engineering News-Record says that these figures tally closely with field observations of numerous paving mixers in operation, and adds that besides indicating poor business sense, these conditions speak poorly for the technical proficiency of highway contractors. Obviously if contracting is to maintain successfully its claim to expert skill in constructing, it should be made clear by the workmanlike manner in which contractors operate and maintain expensive machines for construction. The mechanism of a paving mixer is not only extensive but it is correlated so that the various operations will co-ordinate almost perfectly. It needs but a moment's thought to realize that a machine process which by half a score of operations, takes a container of raw materials from a car or truck and places them as mixed concrete on the subgrade inside of two minutes and often in a minute and a half, with one minute of the time consumed in mixing, requires precise operation and has to be tuned up to a high pitch of mechanical efficiency.

Book Reviews

Edited by AUGUST G. HEADMAN, Architect

COLLECTED PAPERS ON ACOUSTICS—By Harvard University Press, Cambridge, Mass.

Friends and colleagues of the late Wallace Clement Sabine, former professor of mathematics and natural philosophy, Harvard University, have made possible the publication of "Collected Papers on Acoustics" and have succeeded in giving this book a presentation that not only is suited to its readers but also as a memorial to the late Professor Sabine.

This book presents the life work of a great and world-known Harvard scholar, whose career was unfortunately ended by overwork during the recent war.

From a reader's viewpoint this book is one of the best purchases of the year, the selling price being ridiculously low, considering the valuable data the volume contains.

PRACTICAL STRUCTURAL DESIGN—By Ernest McCullough, C. E. Published by the U. P. C. Book Company, New York.

A book written principally for the practical office and field man with a limited knowledge of mathematics, but also of equal service and value to the advanced engineer.

The author, Ernest McCullough, C.E., member of the American Society of Civil Engineers and formerly a teacher of men engaged in the offices of architects, engineers and contractors, presents in his book an analysis of many serious complicated structural problems in a simplified, concise and interesting way.

The subject matter is up to date, direct to the point and representative of usual modern practice.

VISUAL ILLUSIONS, Their Causes, Characteristics, and Applications—By M. Luckiesh. Published by D. Van Nostrand Company, 8 Warren street, New York City.

This book is broad in its scope and will be helpful to the general reader, to artists, decorators, sculptors, architects, experts in lighting, and all others interested in light, color, and vision in general.

The book places under one cover facts on visual illustrations that would require months of research to gather for those so interested. The interesting illustrations show up the defective accuracy of our visual powers and leave the mind in a state of confusion.

AMERICAN ARCHITECTURE

The praises of American architects, whose work he describes as a "new art in the truest sense of the word," are sung by George Wybo, a young French architect, in the columns of the Intransigeant, a Paris publication.

The old skyscrapers of New York, he says, "are not always the happiest exam-

ples of architectural conception," but the newer office buildings erected within the last ten or fifteen years are described as "impeccable in execution, well proportioned, possessing harmonious lines, with decorative elements of sober taste, constructed of splendid materials finely fashioned."

The sight of these buildings causes the Frenchman to recognize the existence of a new art "in the truest sense of the word, an art capable of making us feel strong emotions similar to those awakened within us by the power and splendor of our cathedrals and certain monuments of the past in Europe."

Referring to the "tremendous temples of commerce," M. Wybo says, "all these buildings are different from one another, but each in its own style, in its construction, form and architectural lines is undeniably a masterpiece."

American Art Students to Study in France and Spain

On the 11th of May a colony of enthusiastic students will sail from New York to pursue a course of art study in France and Spain, returning from there to America in the latter part of October.

Their travels will take them into the most picturesque sections of Brittany in France, where they will sketch the wonderful and colorful landscape and have for their models the quaintly clad peasant folk.

From France their journey will be into Spain, crossing over the rugged ranges of the Pyranees, down through that little known country of the Basque, visiting Burgos, with its wonderful great cathedral; also Segovia, and other historic places, and resting at Madrid for a season to enable those who care for an opportunity to study and copy the works of the great Spanish masters, Velasquez, Goya and El Greco. After exhausting Madrid and its picturesque nearby cities, such as Toledo and Salamanca, the class will go to the coast and remain through the hot weather, at either Valencia, Alicante, or Maliga.

They will also spend several profitable weeks in Seville and Granada, where they will paint from the Spanish models and the alluring architectural scenery.

From Spain they will cross over into Morocco, in Africa, and remain there until the time of their departure. They will sail from Gibraltar for New York at the end of six months.

These art students will be under the guidance and instruction of Mr. George Elmer Browne, whose reputation as a teacher is bringing students from all over the United States. Mr. Browne is well known in Paris, where he resided for nearly sixteen years. He has conducted the West End School of Art, at Provincetown, Mass., for the past eight years, and is taking this class to Europe this year through the urgent request of his former students. His paintings are to be seen in many of the most prominent art museums in this country, including the National Gallery at Washington, the Chicago Art Institute and many others.

A Steel Basement Window

Architects, contractors and builders in general will be interested in a new basement window in steel now being marketed for use in residences, stores and apartments.

A number of advantages are claimed for the new window, which is designed to take the place of wood windows, and which is being sold through dealers at prices which bring the cost to the building owner as low or lower than wood.

The chief argument advanced in favor of the steel window is that it admits 40 to 50 per cent more light for the same sized masonry opening. This extra illumination is secured through the use of narrow solid rolled steel bars in both frame and sash, thus eliminating the wide wooden members and permitting the use of larger glass lights.

While the new steel window is provided with a lock already attached, it is so designed that a padlock may be used in place of the one provided. This would prevent burglars from cracking out a pane of glass near the lock and opening the window by reaching in.

The new window comes already assembled. There is no planing, fitting nor hanging of sash to fit the frame. The ventilator is removable, being hung at the top by two hinge pins on the inside of the frame. By merely removing these pins, the ventilator may be taken out and sent away to be glazed. If at any time a pane of glass is broken, the owner can remove the pins and lay the ventilator across his bench and glaze it at his leisure and in perfect comfort.

New Type Oil Pump

S. F. Bowser & Company, manufacturers and distributors of oil pumps, have just placed on the market an improved pump which, aside from its wonderful efficiency and other qualities, is an interesting example of how a manufacturer can adapt his own time-proven principles and ideals of manufacture to certain wishes and demands of the consuming public without, in any manner, taking away from the strength of his product.

It is said that this pump actually permits the public to gratify a natural desire to see what one is getting, without making it pay for that privilege (the value of which is, after all, problematical) by risking safety to life and property or losing time or money in service.

It is being shown at all the important automobile shows throughout the country.

Edw. R. Bacon Company Sales Convention

The Edw. R. Bacon Company second annual sales convention was held at San Francisco, February 17 and 18, the event this year being dignified with the publication of an elaborate program booklet entitled "Bringing Home the Bacon." This program also contained the menus for two dinners, one at Marquard's cafe and the other at Tait's. The attendance included the officers of the company, heads of the branches at Los Angeles, Sacramento and Fresno and managers of the various sales divisions, numbering sixteen, together with the salesmen and office employes of the several branches.

On the title page of the program appears the following tribute to the head of the company, entitled "Bacon":

May our glasses ring; may our eyes grow dim,
For here is a man who fights to win;
His men are faithful, his heart is just,
Let's give him a hand this night, or bust.

This verse was followed on the next page by a paragraph elaborating the spirit of co-operation and loyalty distinguishing the organization. It reads:

"As we gather here amid the glow of good fellowship, we have reason to be proud of such an assembly. One year ago we were called together to get acquainted, exchange opinions, discuss new policies, and in general to better fit ourselves for the task before us. That was yesterday. Today we are better acquainted. We find we are more than comrades, we are partners! We are working for one another and in so doing we are not only benefitting ourselves, but are building up an organization that will stand as a monument to us after we are gone. How much more could a living mortal expect, or desire to accomplish in life? Our chief, who has made it possible, must not be forgotten. We have had as a pilot a man whom we have all learned to admire, whose judgment, ethusiasm, energy, and rock-blasting determination has made for him a place in the hearts of his partners, employes and fellowmen, that may justly be envied by any commander of industry."

Zoning Ordinance for Bakersfield

The Bakersfield City Planning Commission has voted to ask the City Council for an appropriation of $2500 for city planning work, as the result of a conference with Mr. Charles H. Cheney, city planning expert. If the council appropriates the money Mr. Cheney will be employed to draft a zoning ordinance for the city.

Practical Problems and ARTISTIC VALUES

MODERN architecture is as much a matter of solving practical problems and meeting economic requirements as it is an expression of artistic values.

In all these phases the architect of today looks ahead at the same time that he reinforces his vision and judgment with the lessons of his predecessors.

Historic training tells him that the ancient Assyrians, the Greeks, the Romans and the later Renaissance Italians found Terra Cotta a ready medium for the expression of artistic values.

And looking back but a decade or two, the architect perceives that our earlier office buildings of fifteen stories or more made use of Terra Cotta—the material most effectively combining lightness with crushing resistance and fireproof qualities.

The Crocker Building, for instance, has stood thirty years,—through a disastrous fire. It remains in perfect condition.

Copyright, 1922, by National Terra Cotta Society *Drawing by Hugh Ferriss*

CROCKER BUILDING
SAN FRANCISCO, CAL.

Grey unglazed Terra Cotta — A. PAGE BROWN, *Architect*

Its very existence today is ample evidence that every esthetic, structural and economic requirement of a material for the tall office building is thoroughly met by Terra Cotta.

NATIONAL TERRA COTTA SOCIETY is a bureau of service and information. No matter in what class of buildings you are interested, write us, and we will send you a brochure or other information illustrating Terra Cotta's value and achievements in that field. Address, National Terra Cotta Society, 1 Madison Avenue, New York, N. Y.

TERRA COTTA

Permanent *Beautiful* *Profitable*

Coloring Concrete

By A CEMENT WORKER

You can not use paints or stains, but must use a pure mineral cement color that is free from clay, gypsum and organic matter.

I recommend the use of an average of 5 lbs. of color to every bag of cement, with the exception of green, in which instance use 7 lbs., and in the case of black use 2 lbs. in 1 to 2½ mix.

Also the following formula which I am sure will be both satisfactory and durable. The colors will not fade if the directions are closely followed. These recipes were given me some years ago, and I find that wherever tried, they have proved to be all that was expected of them. The quantities given are per barrel of cement, the coloring matter in each instance being mixed dry with cement and sand. Caution is given that venetian red and common lampblack should not be used, as the color obtained with these materials will run and fade. The various colors and quantities of coloring materials for each barrel of cement are as follows:

For brown, 25 lbs. of best roasted iron; or 15 lbs. to 20 lbs. of brown ochre.

For black, 45 lbs. of manganese dioxide.

For blue, 19 lbs. of ultramarine.

For buff, 15 lbs. of ochre. (This is likely to considerably reduce the strength of the mixture.)

For green, 23 lbs. of greenish-blue ultramarine.

For gray, 2 lbs. of boneblack.

For red, 22 lbs. of raw iron oxide.

For bright red, 22 lbs. of Pompeiian or bright vermillion.

In using coloring matter with concrete, the color should always be mixed with the cement dry, before any sand or water is added. The mixing should be thorough, thereby insuring uniform color.

Memorial Buildings

Architect George Gove of Tacoma, has been commissioned to draw plans for the Memorial to be erected to the memory of ex-service men at Shelton, Washington. It has not yet been decided just how much the structure will cost.

Architects Hill, Mock & Griffin of Tacoma, are preparing plans for a Memorial Hall at Centralia, to be erected to the memory of service men who were shot on Armistice day in 1919. The building is to be 135 feet across the front and 130 feet deep, and will cost $250,000.

STEEL SASH—Truscon Steel Sash, published by Truscon Steel Company, Detroit, Mich.

Its 80 pages contain standard dimension tables, architectural details, specifications and more than 20 pages of illustrations. Engineers, architects and contractors declare it to be one of the most practical and handy reference books ever printed on steel windows.

The ARCHITECT & ENGINEER

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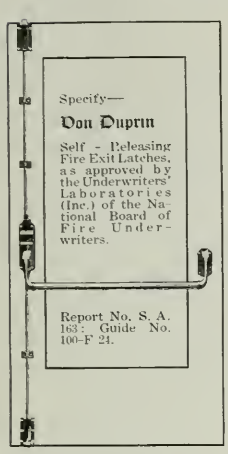

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FUEL OIL SYSTEMS
S. T. Johnson Co., 1337 Mission St., San Francisco.
S. F. Bowser & Co. Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco.

FURNACES—WARM AIR
Mangrum & Otter, 827 Mission St., San Francisco.
Montague Range and Furnace Co., 826 Mission St., San Francisco.
Pacific Heating Company, Second and Grove Sts., Oakland.

FURNITURE—BUILT-IN
Hoosier Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—SCHOOL, CHURCH, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast sale offices, San Francisco, Los Angeles and Seattle, Wash.
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

GAS STEAM RADIATORS—FUMELESS, ETC.
Ra-Do Fumeless Gas Radiators, manufactured and sold by Baird-Bailache Co., 478 Sutter St., San Francisco.

GLASS
American Window Glass Co., represented by L. H. Butcher Co., 862 Mission St., San Francisco.
Cobbledick-Kibbe Glass Co., 175 Jessie St., San Francisco.
Fuller & Goepp, 32 Page St., San Francisco, and Syndicate Bldg., Oakland.
W. P. Fuller & Company, all principal Coast cities.

GRADING, WRECKING, ETC.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco.

GRANITE
California Granite Co., Builders' Exchange, San Francisco.
Raymond Granite Co., Potrero Ave., and Division St., San Francisco.

GRAVEL AND SAND
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.
Del Monte White Sand, sold by Del Monte Properties Co., Crocker Bldg., San Francisco.

GYMNASIUM EQUIPMENT
Ellery Arms Co., 583 Market St., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Corbin hardware, sold by Palace Hardware Co., 581 Market St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora, Ill., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.
Vonnegut hardware, sold by Abeel-Jensen Co. Call Bldg., San Francisco.

HARDWDOD LUMBER—FINISH, ETC.
Parrott & Co., 320 California St., San Francisco.
Strable Hardwood Company, First St., near Broadway, Oakland.
E. L. Bruce Company, American oak flooring, Memphis, Tenn.

HEATERS—AUTOMATIC, GAS, ELECTRIC
Electric Sales Service Co., manufacturers of Therm-elect Water Heater, West Berkeley.
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.
Ra-Do Fumeless Gas Heater, sold by Baird-Bailhache Company, 478 Sutter St., San Francisco.
Wm. J. Schwerin, Agent Hulbert Electric Steam Radiator, Rialto Bldg., San Francisco.

HEATING AND VENTILATING CONTRACTORS' EQUIPMENT, ETC.
Atlas Heating and Ventilating Company, Inc., Fourth and Freelon Sts., San Francisco.
Alex Coleman, 706 Ellis St., San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Lawson & Drucker, 450 Hayes St., San Francisco.
James A. Nelson, 517 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Mechanical Engineering & Supply Co. 908-7th St., Sacramento.

ARCHITECTS' SPECIFICATION INDEX—Continued

Scott Company, 243 Minna St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
Griffin Sheet Metal Works, Fresno.
W. H. Picard and F. J. Edwards, 5656 College Ave., Oakland.
Tiltz Engineering & Equipment Co., 479 Monadnock Bldg., San Francisco.

HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O'Farrell St., San Francisco.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 553 Mission St., San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

ICE MAKING MACHINERY
Cyclops Iron Works, 837 Folsom St., San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant Sts., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSULATION—CORK
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

INSURANCE BROKERS
William Healey & Son, Crocker Bldg., San Francisco.

INTERIOR DECORATORS
Atherly Bros., 2032 Polk St., San Francisco.
Martin & Frederick, 1374 Sutter St., San Francisco.
John Breuner Co., 281 Geary St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero St., San Francisco.

KITCHEN CABINETS
Hoosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.

LANDSCAPE ARCHITECT
Emerson Knight, 704 Market St., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING AND PLASTERING
MacGruer & Simpson, 226 Tehama St., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.

LATHING MATERIAL
Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., Tenth St., near Bryant, San Francisco.

LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.
Pacific Gas & Electric Co., Sutter St., San Francisco.

LIGHTING FIXTURES
Thomas Day Company, Mission, near Third St., San Francisco, and Oakland.
Roberts Mfg. Co., 663 Mission St., San Francisco.
Electric Appliance Co., 807 Mission St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
Pacific Manufacturing Company, San Francisco, Oakland, Los Angeles and Santa Clara.
Pope & Talbot, foot of Third St., San Francisco.
Santa Fe Lumber Co., 16 California St., San Francisco.
Sunset Lumber Company, First and Oak Sts., Oakland.

MAGNESITE FLOORING, STUCCO, ETC.
Dorite Mfg. Co., 116 Utah St., San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

MANTELS—WOOD, TILE, ETC.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Fink & Schindler, 218-12th St., San Francisco.

MANUAL TRAINING EQUIPMENT
Richards-Wilcox Mfg. Co., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Ray Cook Marble Company, foot of Powell St., Oakland.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
Tompkins-Kiel Marble Company, 505 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117-20th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Cornice Works, 269 Potrero Ave., San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218-13th St., San Francisco.
Lannom Bros. Mfg. Co., 5th and Magnolia Sts., Oakland.

NOTARY PUBLIC
William Healey & Son, 208 Crocker Bldg., San Francisco.

OIL BURNERS
Bunting Iron Works, 1215 First Nat. Bank Bldg., San Francisco.
Fess System Co., 220 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
T. P. Jarvis Manufacturing Co., 275 Connecticut St., San Francisco.
G. E. Witt Co., 862 Howard St., San Francisco.
W. S. Ray Manufacturing Co., 29 Spear St., San Francisco.
F. L. Warner, 696-20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 16th St., and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

PANIC DOORS
Vonnegut hardware, sold by Abeel-Jensen Co. Call Bldg., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.
Hill, Hubbell & Company, 115 Davis St., San Francisco.

PAINTING—SPRAY EQUIPMENT
Pneumatic Painting Machinery Co., 1046 Monadnock Bldg., San Francisco.

PAINTING, TINTING, ETC.
Atherly Bros., 2032 Polk St., San Francisco.
Wayne & Williams, 1621 Eddy St., San Francisco.
I. R. Kissel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
The Tormey Co., 681 Geary St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
A. Quandt & Son, 374 Guerrero St., San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 414-424 Ninth St., San Francisco.
Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco and all principal Coast cities.
R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
W. P. Fuller & Co., all principal Coast cities.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PARTITIONS—FOLDING AND ROLLING
J. G. Wilson Corporation, 600 Metropolitan Bldg., Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Francisco.

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS
Victory Manufacturing Co., Monadnock Bldg., San Francisco.

PLASTER
"Arden" brand, A. C. Robertson, Builders' Exchange, San Francisco. U. S. Gypsum Co.

PLASTERING CONTRACTORS
A. Knowles, Call Bldg., San Francisco.
MacGruer & Simpson, 266 Tehama St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College Ave., Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
All-In-One Plumbing Fixture Corporation, 231 Oschner Bldg., Sacramento.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 553 Mission St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
Standard Metals Mfg. Co., 1300 N. Main St., Los Angeles; 216 Hobart Bldg., San Francisco.
Victory Mfg. Co., 423 Monadnock Bldg., San Francisco.
West Coast Porcelain Manufacturers, Oceanic Bldg., San Francisco.

POLES AND PILING
Santa Fe Lumber Co., 16 California St., San Francisco.

POWER TRANSMITTING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PRELIMINARY ESTIMATES, VALUATIONS
Arthur Priddle, Williams Bldg., Third and Mission Sts., San Francisco.

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—HAND OR POWER, FOR OIL AND GASOLINE
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS
Arthur Priddle, Williams Bldg., Third and Mission Sts., San Francisco.

RADIATORS—ELECTRIC STEAM
William J. Schwerin, 217 Rialto Bldg., San Francisco.

REINFORCING STEEL
Edward L. Soule, Rialto Bldg., San Francisco.
Badt-Falk & Co., Call Bldg., San Francisco.
Judson Iron Works, San Francisco and Oakland.
Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Pacific Coast Steel Co., Rialto Bldg., San Francisco.
Truscon Steel Co., 527-10th St., San Francisco.

RERIGERATORS
McCray Refrigerator Company San Francisco office, 765 Mission St.

ROCK AND GRAVEL
Coast Rock & Gravel Co., Call Bldg., San Francisco.

ROOFING AND ROOFING MATERIALS
"Malthoid" and 'Ruberoid," also 'Pabco" ten and twenty year roofs, manufactured by the Paraffine Companies, Inc., San Francisco.
United Materials Co., Sharon Bldg., San Francisco.
H. H. Robertson Co., Hobart Bldg., San Francisco.
Johns-Manville Inc., of California, 500 Post St., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

RUGS & CARPETS
Edw. J. Margett, 61 Ellis St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAND
Coast Rock & Gravel Co., Call Bldg., San Francisco.
Dele Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, San Francisco and Los Angeles.

SAFES AND VAULTS
Hermann Safe Company, 216 Fremont St., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles, and 17th and Mission Sts., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The Paraffine Companies, Inc., 34 First St., San Francisco.

SHEET METAL WORK
Forderer Cornice Works, 269 Potrero Ave., San Francisco.
Griffin Sheet Metal Works, Fresno, Cal.
Pacific Heating Company, Second and Grove Sts., Oakland.
U. S. Metal Products Co., 330-10th St., San Francisco.
Fire Protection Products Co., 3117-20th St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

SHINGLE STAINS
Bass-Hueter Paint Company, all principal Coast cities.
Cabot's Creosote Stains, sold by Pacific Bldg. Materials Co., 525 Market St., San Francisco.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—COMPOSITION, UNIT AND STRIP
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

SINKS—COMPOSITION
Petrium Sanitary Sink Co., Fifth and Page Sts., Berkeley.

STEEL HEATING BOILERS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
Kewanee Boiler, factory branch, Exposition Building, San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 55 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 444 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Benson & Benson, The Alameda, San Jose
Judson Mfg. Co., 817-821 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Ralston Iron Works, 20th and Indiana streets. San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco and Key Route Fell, Oakland.
Western Iron Works, 141 Beale St., San Francisco.

STEEL ROLLING DOORS
Kinnear Rolling Steel Doors, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco.
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles. Waterhouse-Wilcox Co., San Francisco.
Rolph, Mills & Co., San Francisco, Los Angeles, Portland and Seattle.

STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 525 Market St., San Francisco.
"Lupton" steel sash, Waterhouse-Wilcox Co., agts., San Francisco, Los Angeles and San Diego.
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich. Direct factory sales office, Foxcroft Bldg., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS
Zouri Safety Sash Bars—Cobbledick-Kibbe Glass Company, 175 Jessie St., San Francisco.

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SUMP AND BILGE PUMPS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

SWITCHES AND SWITCHBOARDS
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer's Safety Switch Co., 575 Howard Street, San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market street, San Francisco.
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannon & Co., Sacramento; and 77 O'Farrell St. San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.
United Materials Co., Sharon Bldg., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

TILE—STONE—CEMENT
National Stone Tile Company, Inc., Merchants National Bank Building, San Francisco.

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los Angeles, Portland and Seattle.

TRAVELING CRANES
Cyclops Iron Works, 837 Folsom St., San Francisco.

VALVES—PIPES AND FITTINGS
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.

Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.

Grinnell Co., 453 Mission St., San Francisco.

O. M. Simmons Co., 115 Mission St., San Francisco.

H. Mueller Mfg. Co., 635 Mission street, San Francisco.

Kennedy Valve Mfg. Co., 23-25 Minna street, San Francisco.

Victory Manufacturing Co., Monadnock building, San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

Everlasting Blow-off Valves. General Machinery and Supply Co., 39 Stevenson street, San Francisco.

VARNISHES
Bass-Hueter Paint Company, Mission, near 4th street, San Francisco, and all principal Coast cities.

W. P. Fuller Co., all principal Coast cities.

R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.

Standard Varnish Works, 55 Stevenson St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
C. F. Weber & Co., 985 Market St., San Francisco.

Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

West Coast Porcelain Manufacturers, Rialto Building, San Francisco.

WALL BEDS, SEATS, ETC.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

WALL BOARD
"Amiwud" and "Pabco," manufactured by The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.

WALL PAPER AND DRAPERIES
The Tormey Co., 681 Geary St., San Francisco.

W. & J. Sloane, 216-228 Sutter St., San Francisco.

Uhl Bros., San Francisco.

WATERPROOFING (see Damp-proofing)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.

Smith-Booth-Usher Co., San Francisco and Los Angeles.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL
"Gold Seal," manufactured and sold by Bass-Hueter Paint Co. All principal Coast cities.

"Silkenwhite," made by W. P. Fuller & Co., San Francisco.

"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.

The Paraffine Companies, Inc., 34 First St., San Francisco, Los Angeles, Portland and Seattle.

WINDOW SASH CHAIN
The Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, 507 Mission street, San Francisco, and I. W. Hellman Bldg., Los Angeles.

WINDOW SHADES
W. & J. Sloane, 216 Sutter street, San Francisco.
D. N. & E. Walter, 562 Mission street, San Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Waterhouse & Wilcox, San Francisco, representatives.

Hauser Window Co., 157 Minna St., San Francisco.

J. G. Wilson Corporation, 621 N. Broadway, Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Francisco.

WIRE FENCE
Standard Fence Co., 245 Market street, San Francisco; and 310 12th street, Oakland. .....

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Profile View
2/3 actual size.
Hubbell Convenience outlet showing size of Porcelain body for Single or Duplex ype; fitting standard outlet boxes.

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ELECTRICAL SPECIALTIES

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A REVIVAL OF ADOBE BUILDINGS

By IRVING F. MORROW

ADOBE is identified in the popular mind with the Spanish Missions in California, and is regarded as a primitive form of construction, highly perishable, definitely outmoded, and justified where it occurs only by undeveloped industrial conditions which allowed no alternative. With the primitiveness of the method, using the word to connote simplicity and antiquity, there can be no question; documents as old as the early books of the Old Testament record the difficulties of the Israelites in making bricks without straw in Egypt; and to this day there are primitive communities, Oriental, Spanish, Mexican, where adobe is extensively used. But it will probably surprise most people to learn that, in the midst of our highly developed industrial culture, surrounded on all sides by cement, brick, terra-cotta, and stone, there is a movement deliberately to revive adobe construction; and that this movement, far from being an isolated and transient fad, is quiet, reasoned, and widely dispersed in area.

The only current example of adobe which has come to my attention in Northern California is the reconstruction work now in progress at Carmel Mission; although it may have been used in other instances. More of it undoubtedly has been used in the southern part of the State. Mr. John Byers, of Santa Monica, Cal., examples of whose work are shown herewith, is only one of a number of architects who specialize in the designing and building of adobe houses. Mr. Byers approaches his work from the standpoint of craftsmanship. He employs the old methods, with such improvements of detail as the more highly developed industrial conditions of the day render expedient and accessible. The subject is an interesting one, and perhaps the best general survey of it can be given in Mr. Byers' own words:

"First," he says, "let me explain that adobe in Spanish means mud or dirt, and that only. A Mexican does not call any specific soil by the term adobe, as we do. This or that dirt is good or less good to make adobes. They can make adobes out of almost any dirt. I have built houses in a radius of two hundred miles of Los Angeles and never had to pass up a single job on account of the dirt's not being right.

CARRYING AND SETTING ADOBES. HOUSE OF MR. H. R. JOHNSON
John Byers, Designer and Builder

"The vocabulary of the work is varied and picturesque. An adobe is a house, or the mud brick of which it is made. An adobero is the frame or mould into which the mud is put, and the word is also used to designate the man who uses this mould. The pariguela is the stretcher made of wood on which the mud is carried to the adobero. The rajuela is the broken tile or brick or stone put into the chinks between the adobes in the wall to form a plaster bond. A viga is a beam or arrangement of beams like a pergola, often used in the patios, etc.

"The adobe brick can be used in any structure, just as any ordinary fire-baked brick, and the building, when completed, cannot be distinguished from one made of lath and plaster, brick, or hollow tile, which is

ADOBE HOUSE FOR MR. H. A. GORHAM, SANTA MONICA, CAL.
John Byers, Designer and Builder

ADOBE HOUSE FOR MR. STEVENSON, HOLLYWOOD, CAL.
John Byers, Designer and Builder

the so-called modernized adobe. We use these latter methods to some extent, but most of my work is the other thing. I try to reproduce the effect and spirit of the old Spanish adobes, yielding only a point here and there in favor of a modern chimney, flue or bath tub.

"My men have been with me since I began three years ago. They have built adobes some three and four stories high in Mexico; they have worked on the restoration of the old Missions in Southern California, and have built and lived in adobes practically all their lives. Except the younger men, most of them can neither read nor write. They sign their pay vouchers with a vertical cross (+) and the ordinary X means one day and P one half day on the pay rolls. I find them honest, industrious, and

ADOBE HOUSE FOR MRS. MAY MACBENNELL
John Byers, Designer and Builder

ADOBE HOUSE FOR MR. ARTHUR ROSSON, BEVERLY HILLS, CAL.
JOHN BYERS, DESIGNER AND BUILDER

ADOBE HOUSE FOR MR. JEAN IRVINE, SANTA MONICA, CAL.
JOHN BYERS, DESIGNER AND BUILDER

courteous and loyal to their employers. They go at everything they do in a very primitive and direct fashion; they muck or mix the mud with their bare legs.

"If they cannot find straw or manure to put in the bricks, they pull up the grass growing nearby and throw that in. Usually I provide bales of clean straw, though they prefer manure. This, I think, is because in old Mexico it was the nearest thing at hand; though it may be that there is some chemical virtue in the ammonia. Once mucked, the mud is carried on the pariguela to the adobero on the ground, and dumped into it and patted down and smoothed off by hand; when the adobero is lifted off and set down ready for another.

"I use a brick 4 in. x 14 in. x 20 in. for the outer walls and 4 in. x 10 in. x 20 in. for the inner non-bearing partitions. In a two-story building we lay the bricks the 20 in. way for the first floor and the 14 in. way for the second floor, with a 6 in. x 8 in. cement girder to catch

HOUSE FOR CAPTAIN R. A. WILLIAMS, BEVERLY HILLS, CAL.
John Byers, Designer and Builder

the second floor joists. In one-story buildings we use a 2 in. x 8 in. or 2 in. x 10 in. redwood plate bolted down every six feet with a 10 in. lag screw.

"An ordinary excavation of two feet beneath the floor joists furnishes enough dirt to build the house. Adobes of the size mentioned, made and laid in the wall with the rajuela ready for the plaster cost $150.00 per thousand. An ordinary six- or seven-room house would require from four to five thousand adobes. To plaster we use lime and sand and a very little cement, using one coat only over the adobe. This makes a saving of about $1.00 per square yard. We use no casings around the door and window openings, inside or outside, though we can do so if a client insists. The construction is exposed throughout, and heavy timbers, 4 in. x 6 in., 6 in. x 6 in., or 6 in. x 8 in. are used. Some times the rafters or even truss work are of eucalyptus poles. Nothing is faked—if a timber end shows in an elevation the timber runs back and is a supporting member of some sort. No box beams, no hollow walls—the result is a solid building, wind proof, sound proof and water proof.

"This last needs a word. Tar is melted and put on the concrete foundation before any adobes are laid, and waterproofing is either put in the plaster mix before it is laid on, or applied over the finished job.

"The hard stucco plasters do not adhere to adobe walls. Some builders, however, use it over chicken wire fastened to the adobe by means of wire ends laid in the courses as the walls go up. Others use 8d. nails, three to a brick and projecting about one-half inch. The Mexicans claim this only makes a good plaster curtain hanging in front—that there is no actual contact.

"The courses, as I do it, are laid in mud only—a mortar mix would be better but more expensive. The mortar then would be squeezed out from between the bricks and form a rough ridge to hold the plaster and the rajuela could be omitted.

"Where a flat roof with fire wall is designated we use a coping of cement with ¼ in. rods to take up expansion and avoid cracks, putting

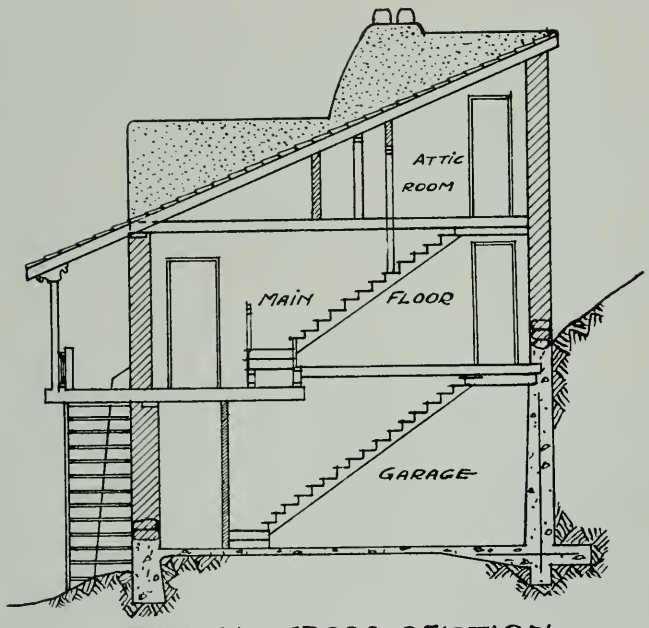
ADOBE HOUSE FOR MR. JEAN IRVINE
John Byers, Designer and Builder

some good water proofing in the mixing. My Mexicans make the old Spanish floor and roof tiles also by hand, and can reproduce the old time ovens and chimneys made entirely of adobe.

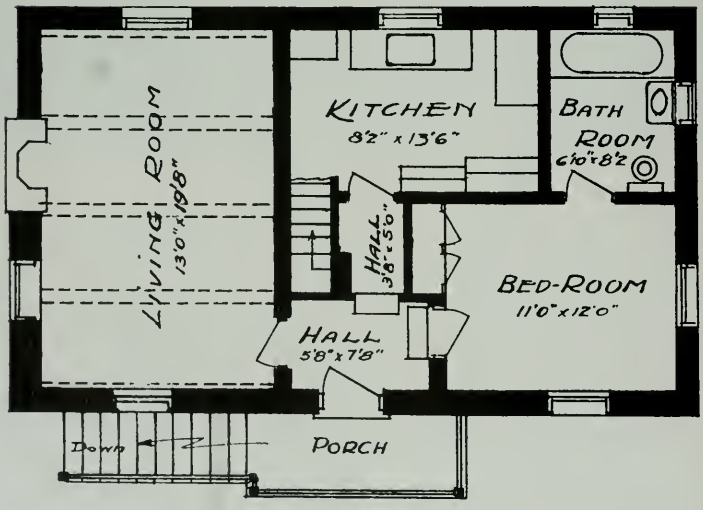
"One has only to look at the old Missions to see how long a naked adobe wall will withstand the elements. An adobe brick once dried will resist almost any amount of water, and bricks even freshly made will take a three-day deluge of rain and still be good enough to use. However, we usually have a great deal of building paper on the job and do not take any chances. Adobe makes a simple direct and sincere construction; it is picturesque and will last a century.

"The work is intensely interesting—a Mexican obrero (or laborer) going up a plank with a forty pound adobe balanced edgewise on his head, makes as good a picture as a Hindoo water carrier or a stone cutter on the Nile.

"The house of which I send you the ink reduction was built almost entirely of heavy timbers from the old Long Wharf (condemned) in



- TYPICAL CROSS-SECTION -



- PLAN OF FIRST FLOOR -

ADOBE HOUSE
John Byers, Designer and Builder

ADOBE HOUSE FOR MR. JEAN IRVINE, SANTA MONICA, CAL. JOHN BYERS, DESIGNER AND BUILDER

ADOBE HOUSE FOR MR. H. R. JOHNSON, BRENTWOOD PARK, UNDER CONSTRUCTION
John Byers, Designer and Builder

Santa Monica. Its roof is made of scrap tile; scarcely a whole tile in it, and so far has not leaked. The iron grills I picked up at various junk yards. We have on the contrary, just finished another adobe house in which everything has been modernized—three tile bath rooms, hardwood floors throughout, enameled kitchen, woodstone sink, etc., etc."

Mr. Byers adds, somewhat apologetically, "Unfortunately I am not an academic architect." I am inclined, on the contrary, to regard this circumstance as not at all unfortunate. Academic architects, in dealing with small work, are all too prone to do anything and everything except what is natural. If a good part of the academic sophistication among us could be superseded by a sound instinct for craftsmanship and respect for means and materials, our architecture would experience a more healthy development. That genuine popular support without which no

ADOBE HOUSE FOR MR. ARTHUR ROSSON, BEVERLY HILLS, CAL. UNDER CONSTRUCTION
John Byers, Designer and Builder

ADOBE HOUSE FOR MR. H. R. JOHNSON, BRENTWOOD PARK, CAL.
John Byers, Designer and Builder

vital architecture can flourish must come, not down from above, but up from below. However many impressive libraries, city halls, railroad stations, war memorials, and other public monuments we may erect, the people at large will remain indifferent to their appeal as long as their intimate tastes are nourished on surroundings which are paltry and unnatural. In propagating sincere construction and logical expression in small buildings Mr. Byers makes himself the true ambassador of a better architecture. The simplicity, naturalness, and substance of his unpretentious buildings are just the qualities needed as antidotes to the flippancy (aesthetic and structural) of much current academic and pseudo-academic design. I hope that Mr. Byers continues to build houses, without indulging in so much as a correspondence or university extension course in "architectural design."

ADOBE GARDEN WALL, SANTA MONICA, CAL.
John Byers, Designer and Builder

REINFORCED CONCRETE SKYSCRAPERS

TALL buildings are numerous in our large cities. Often the only comment that they attract is one of protest against the obstructions encumbering sidewalks during their construction. After a building has been completed few persons not conversant with types of construction will see anything to distinguish it from another similar building. The fact that it may be an entirely different type of construction, introducing perhaps new things of great importance economically, seldom becomes common knowledge. Also seldom does it happen that the average citizen recognizes in a new type of skyscraper an established, accepted type of construction having advantages peculiar to that type alone.

It really required world war conditions to give the necessary impetus resulting in larger, more extensive adaptation of reinforced concrete for skeletons of tall structures. Designers thus forced through inability to obtain materials for the commoner types of construction, turned to concrete and at the same time found to their surprise that the cost of such structures was lower than they had previously believed. They learned that an actual saving resulted by comparison with usual types of so-called thoroughly fireproof construction, worthy of comparison with reinforced concrete.

They have found also that the time required to complete concrete buildings is somewhat less because the time element is considerably under control of the builder, since there is no necessity of waiting for the fabrication and shipment of structural shapes from distant shops. Materials for the most part can be obtained locally. This was of paramount importance during the war when economies in the use of transportation were imperative, and it still constitutes an important advantage of concrete construction. As a result hundreds of tall reinforced concrete buildings have sprung up during the last few years. In fact, in many localities the majority of structures, ordinarily classed as high buildings, and which have been in progress or were completed during the past season, are of reinforced concrete. In Minneapolis and St. Paul alone there are twenty-six buildings from ten to fourteen stories high with reinforced concrete structural frames. A hasty survey covering the entire country discloses that the number of reinforced concrete buildings over ten stories high, completed or under way, total around 300.

Architectural and engineering firms that have thoroughly enlisted the economies and advantages of the high reinforced concrete building have become specialized in this type of construction because of the possibilities thereby offered for professional advancement.

The question naturally arises as to why high concrete buildings required the impetus of war to force their advantages to the attention of architects and engineers. In addition to the mistaken idea that they were high in first cost, the impression prevailed that the lower story columns of high reinforced concrete structural frame buildings would have to be excessively large. Reduction of rentable floor area was added to the assumed higher cost of the buildings with natural acceptance of the resulting error that the entire building would be uneconomical. This impression, like others of its kind, became fixed through tacit acceptance without investigation, largely because of its frequent repetition. It is gratifying to know that the question is no longer viewed in this light—that knowledge of facts prevails and that unsupported statements cannot pass without challenge.—Building Management.

MONT ST. MICHEL

By HOWARD G. BISSELL, Architect

DURING the two and a half years since the close of the war I have enjoyed reading the many accounts of army experiences which have appeared from time to time in the pages of various magazines. These tales of life at camp, in the trenches, and in the many fields of war activity in Europe, have been doubly interesting to me because of the memory of my own experiences with the 77th Division, which saw some six months of active service. But to me, much as I like to think back to those stirring times on the River Vesle and in the Argonne Forest, the opportunities in the way of travel and study which came after the armistice proved much more interesting. I remember how quickly my thoughts, engrossed up to Armistice Day in war and what Sherman said about it, turned toward the possibilities of "seeing France." Perhaps every soldier had the same vision, especially those of us who are architects or artists. "On to Paris," formerly the battle-cry of the German war lords, now became the watchword of every soldier in the A. E. F. Many went on leave, others without this formality. The architects, painters and sculptors in the army were especially favored by the organization of the A. E. F. Art Training Center at Bellevue, a suburb of Paris. It is of this army Art School and in particular of one of the travel opportunities afforded by it that I like to think and write. Without these trips throughout France my vision of that country would have been limited indeed.

A complete account of the organization, purposes and history of this school was published a few months after its close in June, 1919, in one of the Eastern architectural periodicals. Referring to this article as a back-ground, I wish here to emphasize the wonderful opportunity afforded the men of the architectural profession in the A. E. F., an opportunity of which all those privileged to attend the school took the utmost advantage. Perhaps one phase of its many activities that was recognized as of greatest value, especially by those of us who had never traveled in France before, was the privilege accorded by the authorities of making side trips to the many places of historical and architectural interest within a few hours' ride of Paris. Armed with sketch-books and water colors, parties from the school could be seen any week-end in all parts of northern and middle France. Numerous were the cities abounding in wealth of material for the architect and artist—Rheims, Amiens, Mont St. Michel, Chartres, Tours and the chateaux of the Loire, Dijon, Rouen, Soissons, and many others—places well known to the architect as the sites of monumental cathedrals, fortresses and palatial dwellings, photographs of which we had studied at school and had long dreamed of seeing in actuality.

It was on one of these sketching trips I first saw Mont St. Michel, on the coast of Brittany. It is an inspiration now, as I think over the impressions of my visit to the Mont; the fascination of the cathedral with its romantic history; the picturesqueness of the town; and last but not least those justly world-renowned omelettes of the good Madame Poulard.*

Well do I remember that first thrilling glimpse of Mont St. Michel. After a night's ride from Paris, our party arrived at Pontorson, the

*The original Mme. Poulard, I believe, has been dead for some time, but the tradition has been assiduously preserved by the cooks and the hens of the region.—Ed.

station nearest the Mont on the Paris-St. Malo Line. Accepting the services of the most energetic of a dozen competing bus-drivers, we were soon traversing the six miles to the Mont in his war-scrapped machine. It was an early morning in May—"apple blossom time in Normandy." As we approached the coast, there loomed up before us through the morning mists of the sea "the lonely rock, walled, battlemented, towered, springing up from the sea, and in its picturesque medievalism more perfect, more complete, than anything any medieval painter or engraver ever saw or imagined."

The island, lying about a mile from shore, is reached by a roadway on a dyke built within the last generation. At high tide the Mont is completely surrounded by the sea, (except for the dyke) while at low tide one sees on three sides miles of wet, shining sand, tempting the pedestrian who warily avoids the quicksand. Unfortunate indeed, though, if he be caught by the incoming tide, which rushes on with the speed and roar of an express train. Not always has the Mont been thus isolated, an island "in the peril of the sea." When the first monks settled there in the sixth century, this lonely rock towered in the midst of a great forest through which a road had been built by the Roman conquerors of Gaul.

One day early in the eighth century there came a terrible quaking of the earth, then a tidal wave which swept away the forest, leaving in a large bay an isolated hill with only those vestiges of the forest visible today. Since that time the monks, finding their space limited, have tunneled deep into the rock and have built high in the air; the little village has clustered itself on the leeward side of the towering abbey; and tremendous walls have been erected to guard against threatening tides from the sea and hostile armies from the land. Such, physically, is the Mont as we saw it that morning.

Crossing over by the dyke to the only gate in this formidable sea wall, we were immediately surrounded by the hotel porters, men and women, vociferously competing for our patronage. To keep the peace we ignored their pleas, thinking it wiser to examine for ourselves the respective merits of the various hotels. Great was our surprise to find that all the hotels bore the name of Poulard—Poulard veuve, or Poulard neuf, or fils—and that each offered equally wonderful omelettes of all kinds.** After breakfast and five other meals at the hospitable board of dame Poulard and her sons and nephews, I can agree with the advice of the French writer who says: "A vous, ami lecteur, de faire votre choix; quel qu'il soit, il sera bon."

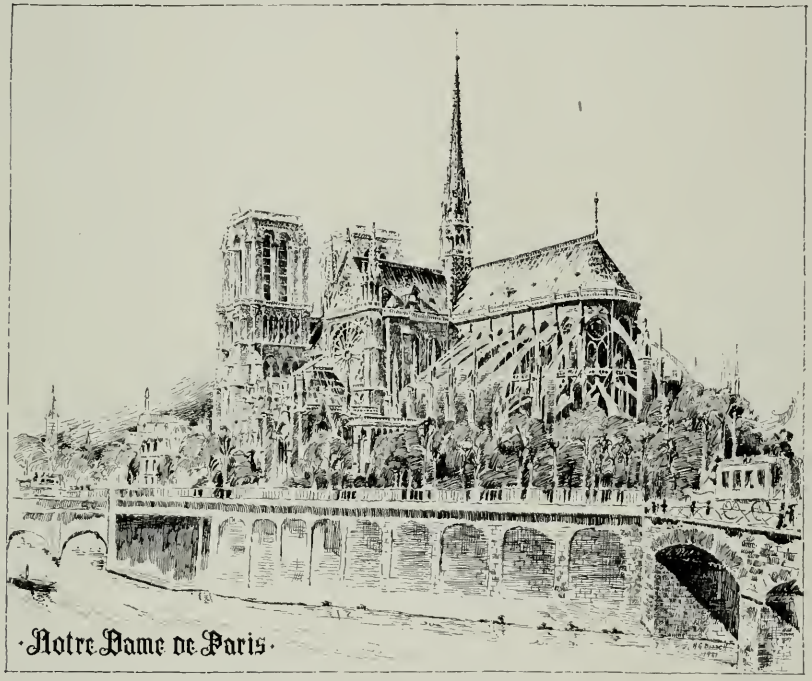
Thus refreshed by the delicious omelettes served by the aristocratic Madame Poulard herself'† we began to wander leisurely around the island. The only way to reach the Abbey was by passing through the town, following in all its climbings and turnings the one squalid street which starts just inside the main gateway at the Tour de la Barde. This road proved to be a sort of winding staircase lined on either side with old inns or shops, leaning against each other and into the road "like so many decrepit inhabitants." On the one side narrow walks led at intervals between the houses out to the terrace along the top of the sea wall; on the other side were precipitous stairways climbing to the upper

**This might be cited as proof either that the original Mme.. Poulard stamped a dominant culinary personality on the region for all time—established, as it were, a local school of omelette making; or else that omelette making is an impersonal community tradition in which she merely played a part of unusually graceful acquiescence. This simple dilemma should suggest caution in the facile game of tracing obscure historical influences, in which some critics are prone to indulge. Ed.

†See note* p. 59. Ed.

levels of the town, the numerous picturesque houses and the little sheltered garden spots which lend such charm to the landscape. Everywhere were enchanting views; we paused again and again, thrilled with the romance of the medieval setting, and trying to picture in our minds the events that must have transpired there in bygone days.

A contributor to "Arts and Letters" has given us in a few words an idea of the romantic history of Mont St. Michel. He writes of the Mont as "a marvel of art and a miracle of nature, celebrated alike in the annals of history and the legends of tradition. It is, in fact, a perfect nest of legends; it has been an asylum of religious thought, of prayer and meditation; the seat of science; the studio of art; a monastery, a cathedral, and a fortress. Mont St. Michel has been all these,



NOTRE DAME DE PARIS
Pen Sketch by Howard G. Bissell

and it thus holds within its walls an epitome of the life of France during the stormy but romantic period known as the Middle Ages."

Not being an historian, I shall by no means attempt to discuss the complex facts of this period in the history of France, however important they may be. Let it suffice here to relate a few of the events in the history of the Mont itself. Known as a sacred spot in the time of the ancient Gauls, and dedicated to the worship of Jupiter by the Romans, who called it Mont Jovis, the Mont did not gain its present name until the eighth century. At this time Aubert, Bishop of Avranches, built a church on the rock, dedicating it to St. Michel, and thousands of pilgrims journeyed from far and near to worship at his shrine Dur-

ing the centuries following the flood which separated the Mont from the mainland, fortifications were built which enabled the inhabitants to withstand repeated attacks from hostile armies. The English, especially, while in possession of Normandy, made several attempts to capture the Mont, but were compelled to retire each time from the rain of huge boulders hurled down by the defending garrison. Besides the serious damage that portions of the buildings suffered at the hands of invaders, fire after fire has ravaged the Mont during the centuries of its existence. The Abbey was subsequently converted into a prison for political and religious offenders, serving well in this capacity at the time of the first revolution. Up until 1863 as a house of detention, it finally came under the jurisdiction of the government as an historical monument. Under the supervision of the Société des Monuments Historiques attempts have been made to repair some of the damages wrought by fire and battle, and to restore the Mont and its buildings to their former medieval condition. Of latter days thousands of tourists, attracted by this relic of a feudal past, have flocked to the island to "see the sights"; with guide book and inevitable camera, they have swarmed the island and then passed on, making way for the curious horde of the morrow. The pilgrims of yesterday came to worship; those of today to picnic.

Climbing ever upward and finding on all sides massive witnesses of this glorious past, we finally reached the entrance of the Abbey itself. Here we were met by the usual guide, who condescended, in return for a fitting consideration, to take us through the Abbey and Cathedral, allowing us the extra privilege of remaining as long as we wished to sketch. It is of course impossible in these few pages to attempt a detailed description of the many vast halls through which we passed that day. An excellent account, historical and descriptive, may be found in "Normandie Monumentale et Pittoresque," by Manche, with many fine illustrations. This account I recommend especially to the average reader of French as being more interesting than other more comprehensive volumes on the subject.

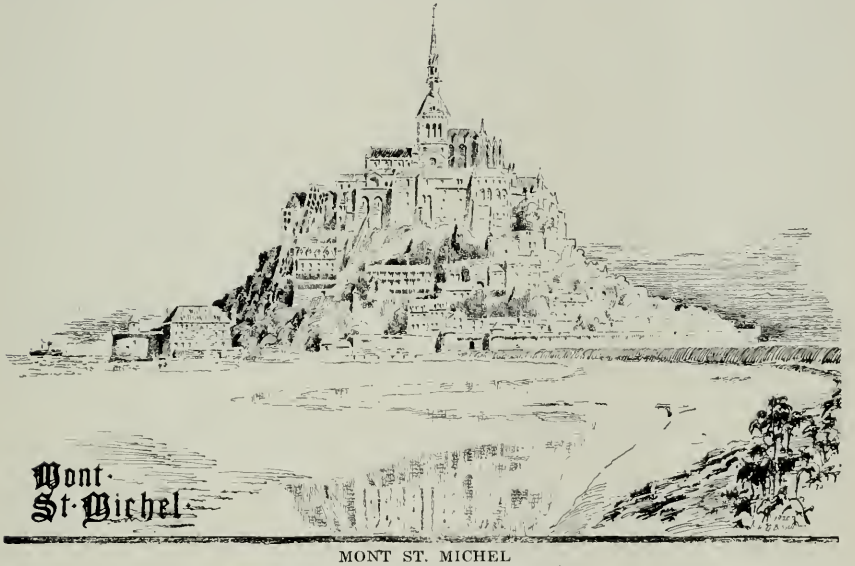
Each room of the vast structure is full of architectural and historical interest. The first hall that we entered was the grand vestibule, known as the Porte des Gardes, where the vassals of the Abbey met on holy days. From this a stairway led to the Merveille, the "marvelous" structure of the group. This towering edifice comprises three stories or zones:

(1) a vast subterranean gallery originally called Les Montgommeries from the Calvinist leader, Montgommery, ninety-eight of whose followers were executed here in cold blood, and later known as Les Ecuries, echoing to the sound of horse and rider;

(2) directly over this crypt the architect had placed the refectory of the monks, a most beautiful example of Gothic architecture, and the Salle des Chevaliers, used during the feudal period of Mont St. Michel as a dining hall of the knights;

(3) above these halls were the dormitory, a vast space of beautiful proportions, and the Cloisters of the Abbey. The latter is a small, square court, high above the sea, and enclosed with double rows of graceful columns with pointed arches above—the whole aptly termed "La Merveille de la Merveille." From the cloisters stairways led to the dungeons, the Crypte de l'Aquilon, the Promenoir, and the cemetery of the monks, all of which played their part in the monastic life of the Middle Ages.

Difficult indeed was the problem which confronted the builders of the Abbey of Mont St. Michel. All of these various halls and spaces were considered necessary elements in the construction of a complete monastery. Given the usual conditions of terrain, the buildings were grouped according to accepted customs of the day with no stint as to area covered. But to build on a high pyramidal, rock, less than a mile in circumference at the bottom, a church, surrounded by all the elements of which a monastery was composed—that was a hard problem to solve. As Manche has put it: "Il ne s'agissait de rien moins que d'entasser Pelion sur Ossa." Of course the only solution was the one adopted, to dig into the solid rock and build story on story in height. All glory to the monks who conceived and carried out their noble task, and left for the eyes of our generation another of the many witnesses that testify to that unsurpassed religious enthusiasm of the France of the Middle Ages.



MONT ST. MICHEL
Pen Sketch by Howard G. Bissell

Leaving the Merveille we were conducted into the church itself, which crowns the highest part of the island and with its lofty spires stands for all time as an emblem of that medieval inspiration. This church, as is true with so many of the French cathedrals, reveals a blending of architectural styles, due of course to varying ideas of the succeeding builders. The nave is of the Romanesque with its massive round arches; while the choir, built at a later period, is of the purest Gothic with pointed arches and delicate tracery. Unfortunately this part of the church has lost many of its most interesting accessories, such as the altar and the stalls. Directly under the choir is the Crypt des Gros-Piliers, so-called from the tremendous size of the columns which support the choir and a portion of the nave.

But Oh! for a breath of fresh air. I have discovered that three hours in an historical monument produces the disease known to sight-seers as "museum fag." We were all suffering from this malady as we

finally emerged from the church and climbed a flight of stairs up to the two Tours des Fous. From these, as well as from the Escalier de Dentelle, we looked out upon the whole composition of the buildings of the island, the marshes toward Pontorson and the sea toward the north. We were as if suspended in mid air, isolated from the material things of the earth, and communing, as did the monks of old, with the heavens above.

But we must return to earth. Retracing our footsteps through the veritable maze of ancient halls, we were led back to our starting point in the Grand Vestibule. A few steps from there and we were out on the terrace which follows the top of the sea wall along the south side of the Abbey. After lunch at one of the numerous restaurants which line the terrace, sketching was the order of the day. My ambition had been to make a water-color study of the island as viewed from the dyke, and the pen and ink reproduced in this issue is a later study from this and other sketches made during the two days of our stay. As I was putting in the finishing touches of color, a dense sea fog rolled in, almost obscuring the island from view. This having cleared up in the evening, we walked out on the sands, making a complete tour of the island and examining the different sides of the Abbey and church, no two of which are alike in composition. I wish it were possible to continue with descriptions of the many beautiful pictures to be seen from the different points of vantage. But space is limited; one must see it for one's self.

It was with the greatest regret that we were compelled to leave the island the next day, after having spent what we all have since agreed were the most interesting and worth-while two days of our stay in France. My ambition is to return some time, and, I shall be happy if with this brief account I have succeeded in imbuing any one else with the desire to see and study this wonderful Mont St. Michel.

WHY ARCHITECTS SHOULD ADVERTISE

By W. J. HENRY, C. E., Seattle, Wash.

I think it was Victor Hugo who said "Everything comes to him who waits." Whether it was Hugo or not, I feel quite sure it was not an American. The American motto is more on the order of "Everything comes to him who goes after it."

It would seem to me, however, if there is one class of the American people more than another that favors the Hugo motto it is the architectural profession. For some reason you never hear very much about architects. Once in a great while when some public building or other large and costly structure is being constructed, and we see mention of it every now and then in the daily press, the architect's name is frequently in print, not always however, commendatory, but at any rate we learn that an architect, if not exactly necessary to the construction, had at least something to do with it. If some one should ask us within a year or two after the structure was completed who the architect was, perhaps we could tell them his name, but after a couple of years his name would probably be as difficult to recall as one of the Vice-Presidents.

Ask the average citizen to direct you to some good reliable architect and nine times out of ten he will answer in this wise, "Well, sir, honestly, I couldn't tell you the name of one, but a friend of mine, Mr. John Blank, had one when he built and if you really want me to find

out I can ask him." On the other hand, if you are in trouble and need a good lawyer, or there is sickness in the family and you need a physician, almost any one of your friends can name you a dozen.

I have rarely visited a city of any size, that in my walks or rides thru the residential district I have not seen one or more architectural gems that invited my more intimate acquaintance, and when I have been so fortunate as to have friends on these walks or rides they have invariably expressed themselves in this manner, "Don't you frequently see a house, the exterior of which is so attractive that you can hardly resist the impulse to step right up to the door, ring the bell and most humbly and politely, with a thousand pardons, request permission from the owner to examine the premises?" And I have always answered in the affirmative. In fact, on occasions, my enthusiasm has forced me at least far enough to step to the door, ring the bell, tell the lady in as nice a way as I could, how much I admired her home from the exterior and ask her if she would kindly give me the name of the architect who planned the dwelling. I can remember only one instance where the lady could give me the information right off the bat and that happened to be in the City of Portland and her husband proved to be the architect.

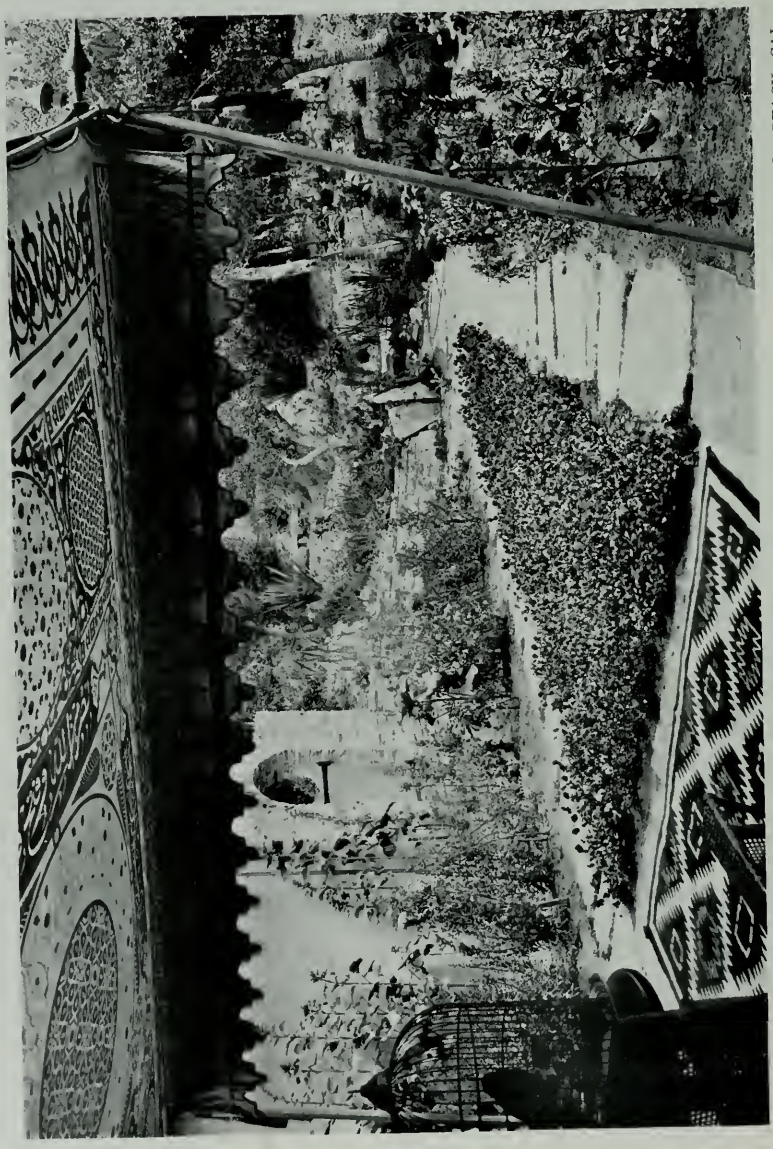
Every now and then there is an architectural exhibit, frequently held in places not especially inviting to the general public. At these exhibitions there are shown many masterpieces of the creative art. But they are mostly understood best by those within the profession and are more or less "Greek" to the general public. I have often wondered why the architects did not have a competitive exhibit with prizes given for plans of homes costing say, one type $3,000, one $4,000, one $5,000 and one $6,000. The prizes to be awarded where this plan had been carried out and the home in concrete form might be viewed. The reason I have mentioned homes costing from $3,000 to $6,000 is there are very few homes costing less than $3,000 where the builders feel it necessary to employ an architect and for those costing more than $6,000 an architect is invariably employed.

Another thing I have wondered at is why architects do not, as an organization, carry on a more systematic campaign of educating the masses as to the advantage in employing a man to assist them in planning their homes, whose business is the planning and superintending of home construction. Thousands of dollars are spent by the manufacturers of cement, lumber in its various forms, plumbing fixtures, builders hardware and dozens of different kinds of material employed in building. The magazines and the dailies carry page ads, beautifully illustrated, but I cannot remember of ever seeing anything similar reciting the advantages one would obtain by employing a competent architect to assist him in designing and supervising the building of his home. I am speaking now of an appeal to the public at large, but more particularly to that portion of the public (about 75%, I should say) that lives in homes costing from $3,000 to $6,000.

There may be countless reasons why things are as they are and maybe Hugo was thinking of architects when he made that remark of his, and it's probably all right, but just the same every time I pass a little Colonial gem I'm going to wonder who the architect was and why he wants to "hide his light under a bushel."

PATIO, HOUSE OF MR. GEORGE T. COOK, PEBBLE BEACH, CAL. PIERPONT AND WALTER S. DAVIS, ARCHITECTS

GARDEN, HOUSE OF MR. GEORGE T. COOK, PEBBLE BEACH, CAL. PIERPONT AND WALTER S. DAVIS, ARCHITECTS



GARDEN, HOUSE OF MR. ELMER H. COX, PEBBLE BEACH, CAL.

GARDEN, HOUSE OF MR. ELMER H. COX, PEBBLE BEACH, CAL.

GARDEN, LOS ALTOS, CALIFORNIA
JOHN R. BRANNER, ARCHITECT

FACTS ABOUT CONCRETE FLOORS

By J. E. FREEMAN

THE design of a concrete floor and the construction of the floor proper are generally the features which are given consideration by the architect or engineer. Until recently little thought has been given to the actual finishing of the floor surface or to the influence of protection while hardening upon the future service which may be expected from the floor. Many specifications have contained no more than a perfunctory general sentence on these matters.

Recent investigations and reports, however, have shown the importance of proper finishing and protection against rapid drying during early hardening, so it is right to expect that more attention will be given this part of the work in future.

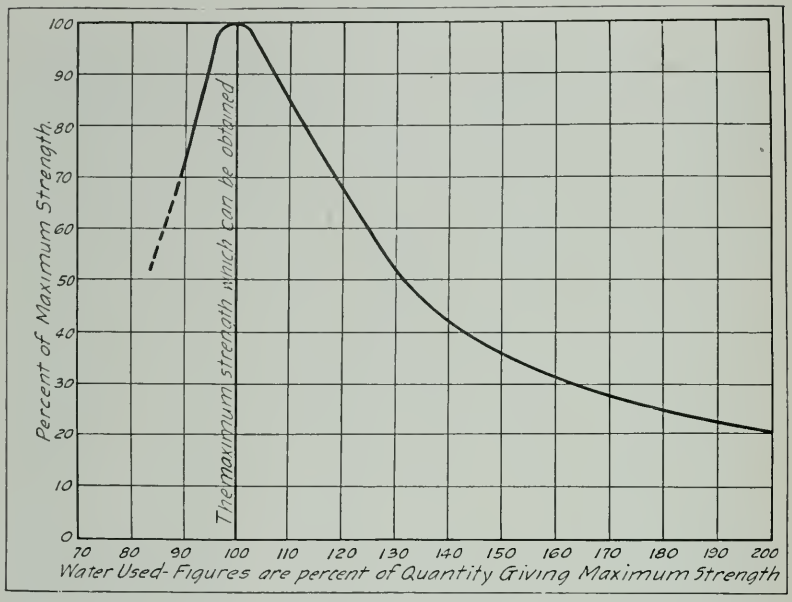
The subject is of direct interest to the owner as well as to the architect or engineer. One man may have excellent concrete floors in his plant, yet fail to realize the essential factors which contributed to their success. Another owner in the same city may find that a floor laid in his building gives trouble from dusting and he assumes that there is some inherent difficulty in the construction. Yet he walks every day over firm, durable sidewalks or travels miles over concrete roads subjected to much traffic and showing little or no sign of wear under severe usage.

In comparing floors with sidewalks or roads this fact should be considered—a sidewalk or road is continually being wetted on the surface by rain or melting snow, while a floor within a building remains dry once the initial moisture within the concrete has gone. Consider also that experience has shown the splendid resistance to wear of concrete roads and streets under heavy traffic to be due in large measure to the retention of moisture in the concrete while hardening during the first two weeks after construction, either by ponding or by an earth blanket kept wet. Ponding means dividing the surface area into short sections by dykes and covering it with water to the depth of several inches. Practically all state highway departments require some such method of protecting the concrete road surface during early hardening, usually for two or three weeks so as to prevent a too early evaporation of moisture from the surface by rapid drying.

Very few concrete floors are given any such protection during this period. They may be occasionally sprinkled during the first two or three days after they are finished, but after that are left to dry out and if the weather is hot they dry out very rapidly. Yet what are floors in industrial plants but **indoor** pavements, subjected often to heavy traffic and deserving therefore of the same careful treatment which concrete pavements receive?

Lack of adequate protection while hardening has even been responsible for "dusting" of less traveled surfaces such as porch floors. It is strange that the need for keeping moisture in the concrete while hardening has not been more fully realized, since the hardening of concrete is not a drying out but a chemical and physical change brought about by combination of the mixing water with the cement, and this change cannot be properly developed if the mixing water is removed by evaporation before the proper time.

This is one reason why basement floors often seem to be harder than others—their position below ground prevents as rapid an evaporation of moisture in the concrete as occurs with unprotected surfaces



CONCRETE FACTORY FLOOR PROTECTED WHILE HARDENING BY "PONDING"
A Method Often Used in Concrete Road Construction

above ground. Yet even here if such floors are constructed during warm weather, some protection during early hardening is necessary to produce the best results.

As an illustration of the effect of proper protection while hardening, upon the resistance of concrete to abrasion and also upon its strength, consider the results of an extensive series of tests made at the Structural Materials Research Laboratory, Lewis Institute, Chicago, illustrated in the accompanying chart. The tests from which the curves were drawn were made on four series of specimens, each specimen tested at the end of 120 days. The results of tests for compressive strength of the concrete are shown by the full line and those for amount of wear are indicated by the dotted line. Specimens in the first series were stored in air for 120 days and then tested; those in the second series were stored in damp sand 3 days and 117 days in air; those in the third series 21 days in damp sand and 99 days in air while those in the fourth series were stored in damp sand the full 120 day period. The specimens were mixed in proportions equivalent to a 1:1½:3 concrete.

In order to approximate within a practicable test period what would be the equivalent of several years' actual service, an accelerated test was made, far more severe than conditions in actual practice, by the use of the Talbot-Jones rattler. (For descriptions see Proc. A. S. T. M., Part II 1916.) Furthermore it must be borne in mind that the test specimens stored in air hardened under conditions more favorable than those frequently found during the summer or in arid regions when the concrete is subjected to a rapid evaporation of contained mixing water from the time it is deposited. Thus the differences in comparative results are undoubtedly less than would probably occur in the field.

The meaning of the tests, however, is evident. Proper protection of concrete surfaces during the early hardening period produces a remarkable increase in the strength of the concrete and decreases the amount of wear, or in other words increases the resistance to wear. The standard specifications for concrete floors adopted by the American Concrete Institute and embodying what is considered to be the best practice in floor construction, require that the surface of a concrete floor be covered with damp sand, etc., for a period of at least ten days after finishing. Reference to the chart will show that this practice will produce an increase of over 75 per cent in compressive strength and a similar increase in resistance to wear.

Later tests made on 1:2 cement mortar such as ordinarily specified for floor surfaces and covering a 90-day test period show that 10-day protection to keep the water in the original mixture from evaporating will produce a 50% increase in compressive strength and at least a corresponding increase in resistance to wear.

Protection for 20 days gives still greater increases and in concrete road construction where great strength and resistance to abrasion are desired such protection is generally specified.

Clearly this feature of protection during early hardening is decidedly worthwhile. For a slight additional care in construction the returns measured in service rendered by the floor are increased by over 50% for practically the same investment in materials and labor involved in the construction of the floor. The economy is evident, for

it is the service given and not the first cost that deserves the greater consideration.

The 1921 Report of the Committee on Cement Floor Finish of the American Concrete Institute contains the following paragraph with reference to this subject:

"It may be urged that conditions as to money and time available for ordinary commercial structures as usually built do not allow the carrying out of the provisions given below for insuring proper floors, but all interested should lose no opportunity of urging upon architects, engineers and owners the ultimate financial gain possible for the owner if the necessary precautions are taken with the original installation. For instance a surface constructed according to the best recommended practice given herein, namely ¾ to 1 inch, wearing course applied some time after the supporting slab is poured, can probably be produced under 1920 conditions for 15 cents per square foot, while the poorest surface described would cost at least 5 cents per square foot. Under ordinarily severe traffic, the latter surface will no doubt at once call for the application of a liquid hardener, paint or other remedy at a cost of from 3 to 5 cents per square foot and in the course of one to five years, for the renewal of the surface at a cost of 20 to 25 cents per square foot thus making the final cost of the poor finish much greater. If properly managed practically no time need be lost, but even though the recommended method means a postponement of the use of the building for a period of two weeks to one month, which should be ample time for proper application and curing, assuming that the rental value of the space is 50 cents per square foot per annum, this means an additional expense of about 2 to 4 cents per square foot, while the increase in wearing qualities may range up to 50 per cent, to say nothing of the loss and inconvenience arising from the interruption of operations to treat and replace defective surfaces."

The arguments advanced for the protection of floor surfaces during early hardening to insure retention of moisture in the concrete mixture, do not however point to a need for wet mixtures. On the contrary investigations have shown the great detrimental effect which an excess of water in mixing concrete or mortar will have upon its strength and resistance to wear.

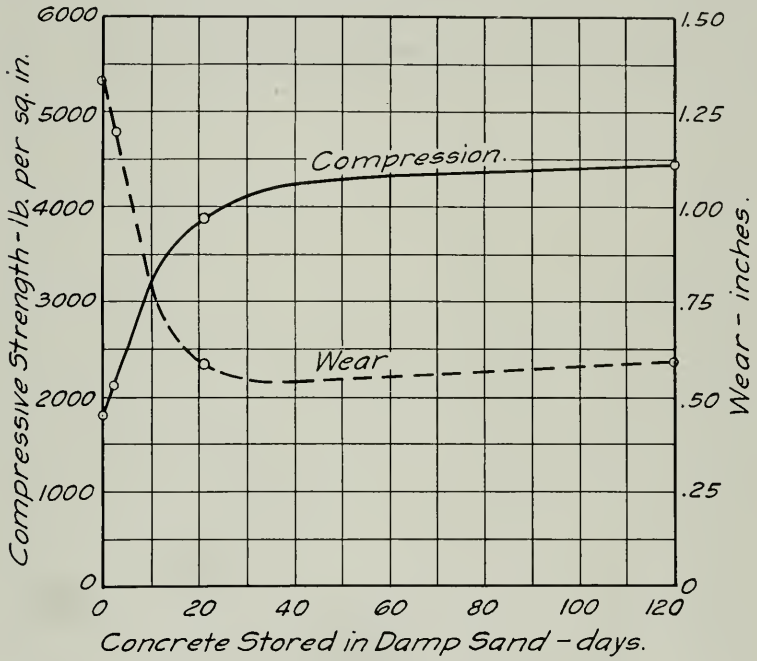
It has been found that one definite quantity of water combined with a given mixture of cement and aggregates will produce the maximum strength possible for that mixture, and that increasing or decreasing this quantity is accompanied by a rapid reduction in the strength of the concrete. This is shown on the accompanying chart drawn from tests made at the Structural Materials Research Laboratory.

For example, if the amount of water used is 20 per cent more than required for maximum strength, the strength of the resulting concrete will be reduced by about 30 per cent; should slightly over 30 per cent excess of water be used, only about **one half** the possible strength of the concrete will be obtained.

While too little water also has the effect of reducing strength, the tendency in construction has been to use an excess of water, producing a sloppy or soupy mixture, particularly for floor topping. This amounts practically to wasting cement, for the use of 1 pint more water than necessary in a 1-sack batch to make a plastic concrete, produces the same reduction in strength as if 2 or 3 pounds of cement had been

left out of the mix. While in most types of construction the quantity of water required for maximum strength would not make a concrete sufficiently workable, strength must be sacrificed as little as possible and the safest rule to follow is the use of the smallest quantity of mixing water that will produce a workable, plastic mixture.

The mortar for floor surfaces should be mixed and placed in a stiff plastic condition such that it must be handled from the barrows with shovels. Methods of proportioning, mixing, placing and finishing that will enable the builder to keep the water content within the lowest practicable limits are of the utmost importance because of the increased



From Bulletin No. 2 "Effect of Curing Conditions on the Wear and Strength of Concrete" Structural Materials Research Laboratory, Lewis Institute, Chicago, May 1919.

strength and resistance to abrasion thus obtained. The gist of the matter might be summed up in the following rule as applied to floors or to any other concrete work: Put the excess water **on** the concrete during early hardening, not **in** the concrete when mixed.

Architects and engineers should find out whether contractors' bids on floor construction include provision for proper protection during early hardening, etc., when they realize the greater returns thereby secured on the owners' money investment. Contractors should realize also the benefits of establishing a reputation for first-class floor construction by careful, conscientious workmanship.

MURAL LUNNETTE, THE CATACOMBS OF CYPRESS LAWN
B. J. S. Cahill, Architect

ZONING APOTHEGMS

Zoning sells a town. An unzoned town is like a dead stock of goods on the shelves.

Zoning is a flexible harness in which city expansion works; it may be adjusted in case it galls or frets at any point.

Zoning will flatten out the human pyramid, which congestion has created in a crowded portion of the city.

Zoning substitutes method for chance, symmetry for confusion, progression for patch work and order for chaos in city development.

Zoning affords for the poor man such security from nuisances and invasions as the rich may provide at great expense.—Charles B. Ball.

MURAL LUNNETTE, THE CATACOMBS OF CYPRESS LAWN
B. J. S. Cahill, Architect

INTERIOR, MAIN TRANSEPT, THE CATACOMBS OF CYPRESS LAWN. B. J. S. CAHILL, ARCHITECT

STABILIZATION OF COST*

By ADOLPH UHL

I desire to preface my talk on "Stabilized Costs" by presenting credentials as to my qualifications in addressing you on this subject.

I built and supervised my first home in 1894. In 1898 I built and and supervised a three story, class C, building, 50x100. I subsequently built and supervised four other buildings. In 1909 I leased from the Academy of Sciences the property adjoining the Emporium, outlining to Mr. Lewis Hobart, architect, the building desired and with Mr. Lewis Hicks, erected the building, eleven stories high at a cost of $550,000. I am in the material supply business and in daily touch with building operations.

As I stated, I built my first home in 1894—a two story seven room house—cost $2750. The lot cost $1700. Carpenters were then paid $3.50 per day of ten hours.

I desire to digress a moment to tell you how I financed this experiment. I borrowed the entire amount from the bank with my father's endorsement and paid off same on the installment plan. That transaction firmly rooted thrift in me. It gave my wife an incentive to save.

It is the ambition of every young wife to own her own home. Therefore, I say to the boy's father—Finance your boy so he can build now. Obligate him to pay back on the installment plan as it creates the saving habit. The greatest boon from father to son is encouragement of this sort when the boy is young.

In 1915 a seven room house cost $3750. The same house could be built today for $5500, but would Mi Ladi buy it? No! There must be hardwood floors throughout, pedestal lavatories, recessed bath tub, breakfast room, built-in side board, tiled sink drain board, stone front stairs and provision for a garage. Of course she's right. Result: Increased cost, so that the seven room house of today costs $7,000. You can keep adding, especially in architectural features, until the cost doubles.

The $7,000 house I refer to has plaster exterior, gum in the living room, hall and dining room; pine, enameled, for the remaining rooms and one bath. This house, although plainly finished, makes a lovely home, and having financed the purchase of such a home for one of our salesmen, I am presenting you with facts and figures.

I hope you understand the comparison of costs indicated by this chart. The black line indicates the price of each contract. The red line indicates the cost of labor. The yellow line indicates the cost of the building material. For example, the material for concrete foundation and walks is 1/3 of the cost, labor is 2/3's of cost, plastering 50-50. Note the bottom line—it is a summary of the whole. The black line represents total cost of building and the red line the cost of the labor. The yellow line the material.

The direct labor of the job, including labor done at mill or mill work, represents approximately 50% of the cost. Add to this 10% for the cost of indirect labor, covering manufacturing of plumbing fixtures, of hardware, electrical fixtures, etc., makes labor 60% of the cost. Assuming the contractor adds 10% for his profits, brings the total to 70%, leaving 30% or $2,100 of the cost of a $7,000 house to cover the construction materials.

*Paper read at Build-a-Home-Now Luncheon, Palace Hotel, San Francisco.

I positively believe the prices on the majority of the building materials are stabilized for months to come—at least on 75% of the materials. Take lead and oil for example, today's price is practically the same as in 1915—despite the fact that the price is uniform at all supply houses. This uniformity of prices applies to cement, plumbing fixtures, rough hardware, etc. An erroneous impression prevails that friendly competition means profiteering. I venture the statement that the leading houses in these commodities would welcome a representative committee to verify the fact that prices are right.

Price cutting invariably leads to disaster. You are, undoubtedly,

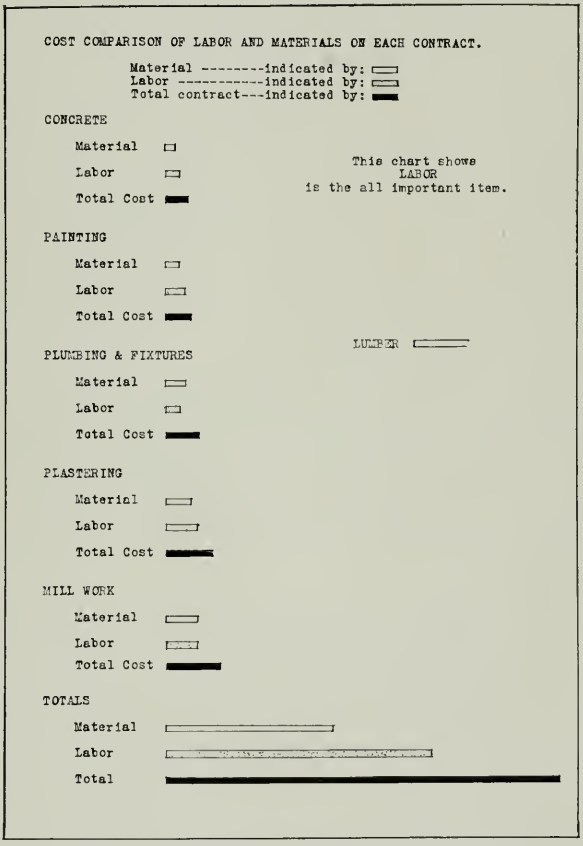


CHART PREPARED BY ADOLPH UHL, ESQ., TO ILLUSTRATE TALK ON STABILIZATION OF COST

familiar with the competition between the Power Companies. Today they are regulated by the Railroad Commission. Grant you the rates might be somewhat favorable to the Companies, but it protects the investing public. Some day they might regulate in the same manner the important building materials. For example: cement, lime and plaster, all California products. You are practically regulating labor wage now and it is the correct principle. It does stabilize costs. Lumber

which is 10% of the cost ($700) has fluctuated more in price than any other commodity. Today's price is positively low, but let us assume for argument that prices all along the line might be 10% lower before the end of the year. That would only amount to a saving of $210.00.

The uncertainty of that saving does not justify you in delaying your building.

The demand for all classes of building exists now.

To revert to the cost of labor: Several years ago, I made a trip up the Nile. Can you imagine my astonishment at seeing man power in place of pumping machinery, raising water from the Nile—a lift of twenty feet—for irrigation purposes? A positive fact—four men passing water by bucket from one to the other. Wage scale—twenty cents a day. These people live in adobe houses, using waste sugar cane stalks for doors and awnings. The youngsters go stark naked. The wardrobe of the grown up consists of a one piece model—a black kimono. Can you imagine such a wardrobe—no shoes, no stockings, low wages and a low standard of living go hand in hand.

In Naples, $1.00 per day was a fair wage. I remember seeing a family of four and a burro sleeping, eating and living in the same room.

The wage of 1893 in San Francisco for carpenters was $3.50 and for painters $3.00 for a ten hour day. This just about enabled the man to make ends meet and in those days, half the year the man went to work at dawn and returned at dusk. I speak from experience. Few owned their own homes and I might say there were less than a dozen millionaires in San Francisco in 1893.

Today labor, not alone in San Francisco, but in all the leading cities of the United States, is paid nearly uniform scale of wages. As you know, an arbitration committee fixed the wage scale for an indefinite period, the cost of living being the underlying factor. That is as it should be. Today we have scores of millionaires and thousands of wage earners who not alone own their own homes and have money in the savings banks, but own their automobiles. On a recent visit to the beautiful Moore home at Menlo, while in the course of construction, I was surprised to see at least a dozen autos in front of the house belonging to the mechanics.

Would you, if you could, have them go back to the 1893 wage scale?

The City of Los Angeles is making herself a world record in building. Do you know they are paying the same wage as is paid in the leading cities in the United States, in some instances more. The people of Los Angeles are not waiting for prices to come down. They realize there is a shortage of homes and they very cleverly let the country know it by wiring the War Department some months ago for 10,000 tents to house the homeless. Good advertising that, and it cost nothing, but they are grand masters at that. I respect their pull-together spirit. It has won out. The more power to you Los Angeles and the sooner we follow suit the greater will be our population.

I am sure you will be interested in a comparison of wages being paid by the leading cities in the United States. I quote from the Wage Scale complied by the National Association of Builders, January 31, 1922:

Los Angeles, Chicago, Cleveland, Pittsburg, Shreveport, Washington, D. C., and Seattle are paying $8.00 a day for carpenters, cement finishers, tile setters, painters. New York is paying $9.00 per day, San Francisco (then $8.35) today $8.00. Boston, Des Moines, Philadelphia and Omaha are paying $7.20 per day. San Francisco, Los Angeles,

Columbus, Seattle, Baltimore, Washington, D. C., are paying plasterers $10.00 a day. Los Angeles is paying hod carriers $9.00 a day. San Francisco, New York, Chicago, Cincinnati and St. Louis pay $7.00 per day.

The wage per day might be seemingly high but don't forget these men do not average over 75% working days. That would mean $150 based on an $8.00 a day scale.

What greater evidence do you ask on stabilization of cost than the fact that labor is being paid a uniform standard wage in practically all the leading cities, and labor is 60% of the cost?

ARCHITECTURE AND ITS ALLIED ARTS

By LOUIS L. MENDEL
Member Washington State Society of Architects

EMINENT men of science and research, while studying classic architecture have attempted to explain the origin and development of the three original orders, The Doric, Ionic and Corinthian (The Romans later added the Tuscand and the Composite) but there is no recorded history of their origin or the time it took to develop them as we know them today—simply theories.

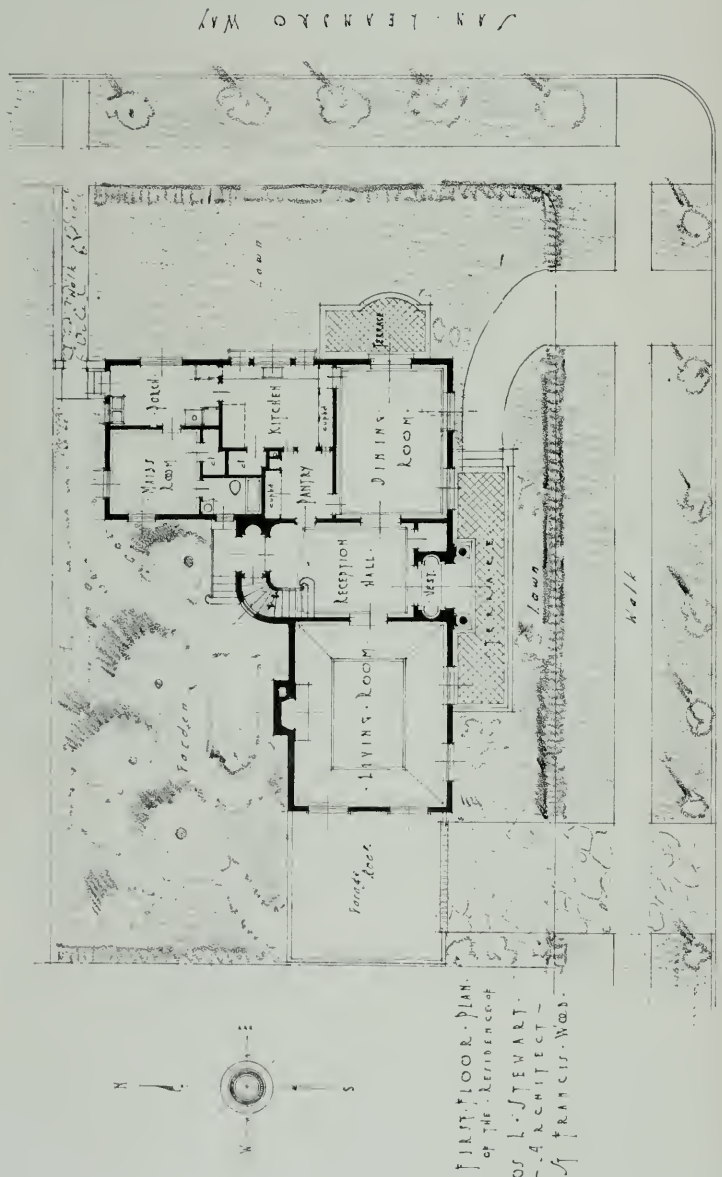
History does not show if any part of the architecture was borrowed from pre-historic nations. The history of Egyptian architecture may be said to begin with the construction of the pyramids, but it is long after this age that we find in Egypt a form of structure, which contains the facsimile of style appearing at a later age in Greece.

Foremost historians concede that the inception of architecture in Egypt was the building and decorating of monumental tombs with sculpture and painting to preserve the aspect of the dead.

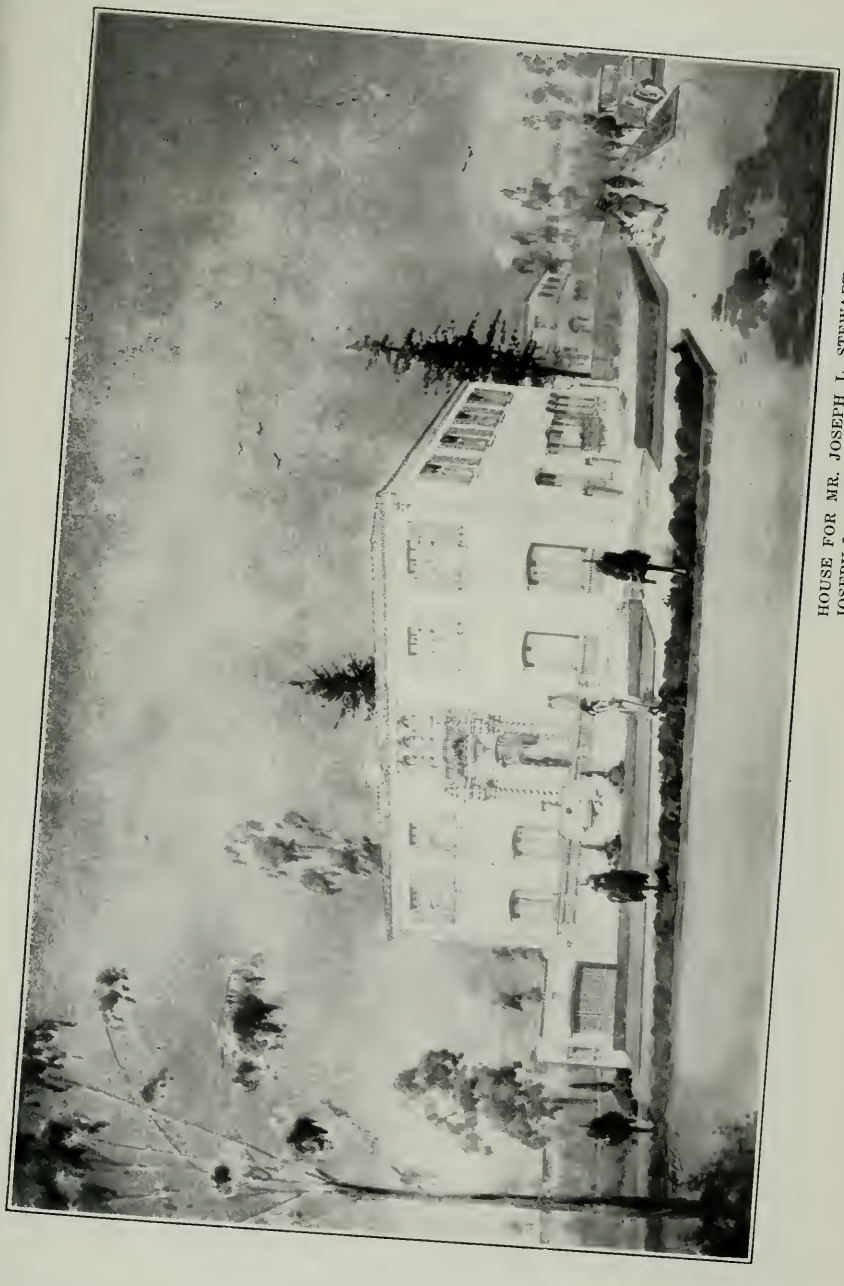
Next in order of style we have the Byzantine, Arabian, Romanesque, Norman, Gothic, Early English, Perpendicular and Renaissance. After a clear conception of the classes we then take up the styles as advanced with the development of the European countries. A clear knowledge of the principles of these several styles enables an architect to develop and utilize many pleasing effects in his designs for public and domestic work.

Henry Hobson Richardson and Louis H. Sullivan, two of our great American architects, came the nearest to establishing individual styles, as is given credit to any Americans, but their styles did not develop beyond the originators, further than the lasting influence they left on American architecture.

Thirty-five years ago an architectural student would seek a master architect, with an established reputation and practice, where he might be apprenticed to learn every branch of the profession; or, if he was the son of a man of wealth he would be sent to the Beaux-Arts in Paris to finish his education. At that time few American universities had established schools of architecture, while today America has numerous schools of Architecture, Landscaping, Painting, Sculpture and Music, which are up to the world's standard. Is it not marvelous what our American school system of education has accomplished in less than half a century? The United States is fast developing her own ideals in Architecture, Sculpture, Painting and Music, and with her students educated at home, with American environments, we may look to even a greater advancement in the next half century.



PLAN, HOUSE FOR MR. JOS. L. STEWART
JOSEPH L. STEWART, ARCHITECT



HOUSE FOR MR. JOSEPH L. STEWART, ST. FRANCIS WOOD
JOSEPH L. STEWART, ARCHITECT

BUNGALOW, PACIFIC GROVE, CAL.

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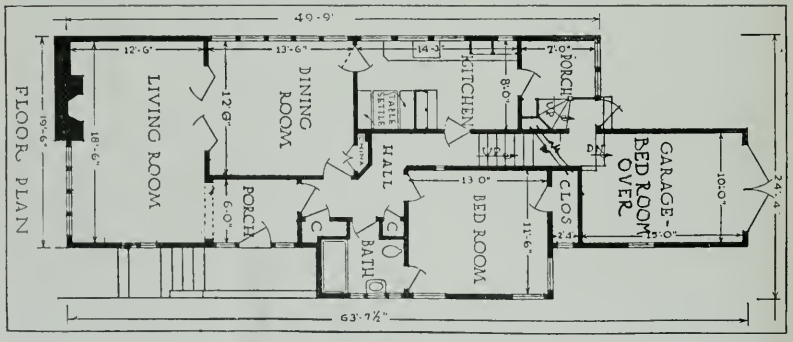


PLAN OF BUNGALOWS IN JUNIPER PLACE, SAN FRANCISCO
Morrow & Garren, Architects

BUNGALOWS IN JUNIPER PLACE, SAN FRANCISCO
MORROW & GARREN, ARCHITECTS

These Bungalows Are All on Plan Shown on Page 86

BUNGALOWS IN JUNIPER PLACE, SAN FRANCISCO
MORROW & GARREN, ARCHITECTS

These Five Bungalows Are All on Plan Shown on Page 86

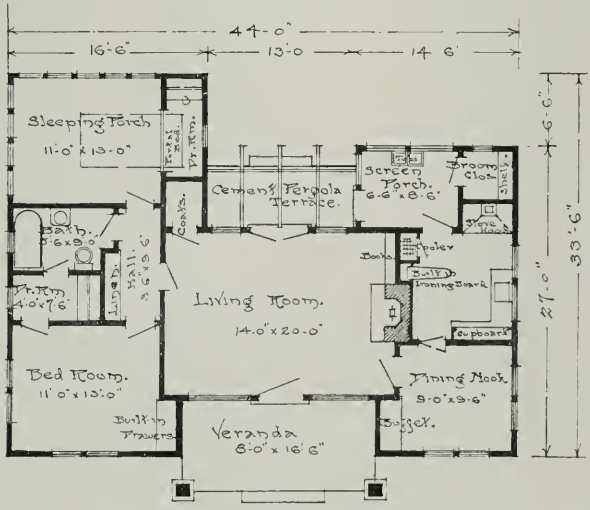
These Five Bungalows Are All on Plan Shown on Page 86

BUNGALOWS IN JUNIPER PLACE, SAN FRANCISCO
MORROW & GARREN, ARCHITECTS

LIVING ROOM

DINING ROOM. BUNGALOW IN JUNIPER PLACE, SAN FRANCISCO
Morrow & Garren, Architects. (Finished in Southern Gum.)

AN OAKLAND BUNGALOW

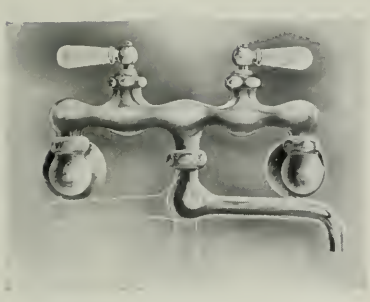


PLAN, AN OAKLAND BUNGALOW

ENTRANCE TO HOME IN MONTEREY

PROGRESS IN SANITATION*

By ARTHUR J. PHILLIPS



The Swinging Nozzle Mixing Sink Faucet

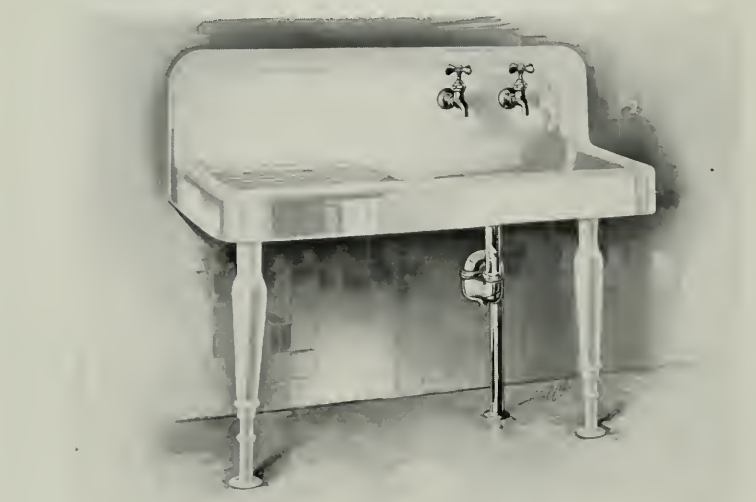
SANITARY plumbing has been a decided boon to womankind and much that formerly proved nerve-racking drudgery is happily no longer tolerated in the well-appointed home. Compare the present efficient kitchen with those in use a score of years ago. Plumbing fixtures are now usually installed—especially kitchen sinks and laundry trays—to conserve physical energy and to render kitchen and laundry work pleasant and agreeable.

In lightening such domestic tasks the popular one piece kitchen sink supported on adjustable legs has played an important part. Such sinks can be obtained with sink, aprons, drainboard and back cast in one integral whole, without a joint or seam to harbor grime or dirt. These with single drainboard may be obtained in a variety of sizes ranging from 42 in. x 20 in. to 60 in. x 22 in. The type with two drainboards requires more space and these range from 60 in. x 22 in. to 78½ in .x 22 in.

For support these sinks are installed on adjustable legs and may be set from 30 to 36 inches from floor to top of drainboard. When set at the right height for the user, physical economy results.

In connection with such sinks the swinging nozzle double mixing faucet is recommended. The user draws thru one nozzle water, hot, tepid or cold. The swinging nozzle when not in use is pushed back out

*Fourth and concluding paper on Modern Sanitary Plumbing.



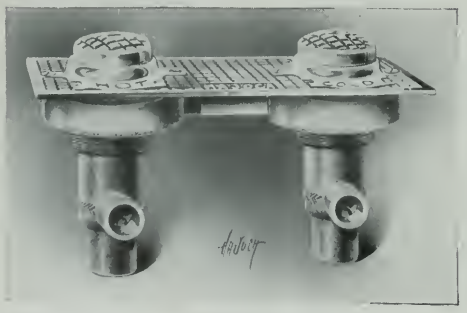
The One-Piece Sink With Adjustable Legs

The Drinking Fountain That Projects Both an Angular and Vertical Stream

tual contact with any fountain parts.

There is one very ingenious device accomplishing this. On an annular ring are eight small jet holes so drilled that the eight individual streams are projected in angular streams and where these meet they form a vertical column or mound of water easy to drink from and high enough above the metal parts to prevent actual contact. Should the drinker try while drinking to touch the metal ring with the mouth or face the eight little jets would plug on the face in such a way that the drinker would immediately desist from the attempt.

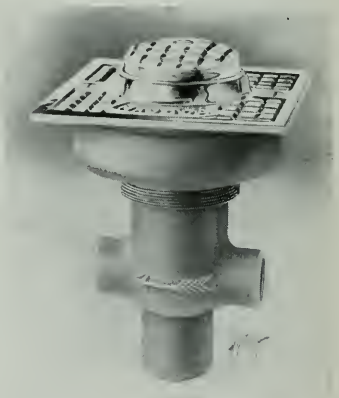
As treadle operated drinking fountains afford most convenience to the



Double Treadle Valve for Surgeon's Lavatory

of the way preventing breakage of china and giving more work room and affording ample accommodation for deep vessels. The mixing faucet idea is becoming extremely popular with progressive housekeepers and the demand for it is increasing to very large proportions.

Considerable thought has been given by sanitarians to the drinking fountain subject. Of course the essential thing is that the orifice thru which the water is projected shall be sanitary and provide a convenient easy way to quench the thirst without permitting the drinker to come into ac-



Non-hammering Treadle Valve

drinker and obviate manual contact, their installation is specially desirable.

The valve, however, should be so constructed that it responds to the slightest touch of the foot, all the working parts should be confined to a small space and made so they can be readily taken out without disturbing the piping or breaking the floor and above all the valve should operate under varying pressures without hammering.

It is often desirable to flush fixtures such as urinals without manually operating the flushing device. The treadle valve is therefore coming into quite general use. Users instinctively desire to flush fixtures and treadle operated devices encourage this human trait; wherever, possible, therefore such fixtures especially in public places should be equipped with the treadle valve.

In surgical work either the treadle or knee action valve on lavatories and sinks is an indispensable necessity and it is not improbable that many sanitary advances in the future will come from a more general use of the treadle operated valve on fixtures now almost universally hand operated.

CORROSION OF UNDERGROUND PIPE

THE Bureau of Standards, Washington, recently issued the following statement:

In certain sections a very serious condition exists in connection with underground pipe systems, owing to the corrosive action of the soil upon the iron of which the pipe is made. The loss from this cause is so large that the bureau recently has undertaken an extensive investigation of the subject, with particular reference to the corrosive action of soils on gas and water mains.

In this investigation the bureau has the co-operation of the Bureau of Soils of the Department of Agriculture, the pipe manufacturers and the public utilities companies through the Research Sub-committee or the American Committee on Electrolysis.Forty locations have been selected representing the different kinds of soils to be found throughout the United States and at each locality a number of samples of every kind of iron and steel pipe in commercial use will be buried. Some of these samples will be uncovered from time to time to determine the rate of corrosion. Complete data on the physical and chemical properties of the soil and the pipes will be obtained and extensive laboratory experiments will be conducted to determine the effects of variations and individual characteristics of both soils and pipe materials. Some tests of representative pipe coatings also will be undertaken.

The results of the tests should be of great value in determining the importance of soil corrosion and in selecting the kind of pipe best suited for use in any particular soil. It is expected that considerable data as to the relative rates of corrosion of the different kinds of pipe in the soils under observation will be obtained within two or three years, but the investigation probably will continue over a period of eight or ten years. Progressive reports will be published from time to time as developments warrant.

WRIGLEY TOWER LIGHT VISIBLE 20 MILES

The Wrigley building, Michigan boulevard, Chicago, presents a very striking appearance when it is illuminated at night. The brilliant revolving lights in the top of the tower were not installed as a part of the decorative scheme, as some people imagine; rather they serve as a light house beacon, having been installed by the United States Department of Navigation. This beacon is 400 feet above lake level and is exceptionally powerful, and can be seen for a greater distance than any other signal light on the Great Lakes. In clear weather the light is visible twenty miles away.

THINKS THERE ARE TOO MANY STYLES OF PLUMBING FIXTURES

OURS is undoubtedly an age of great extravagance, and as in the case of many other commodities bought by the public, extravagance in plumbing has led to the manufacturers displaying in their showrooms, and illustrating in their catalogs, a vast selection of elaborate and sometimes very expensive fixtures. "A too large variety of fixtures and fittings is manufactured for architects, builders and owners of houses to choose from," said Mr. William Paul Gerhard, consulting sanitary engineer of New York City, in suggestions made before Secretary Hoover's National Building Code committee in the interest of the betterment of the housing situation. Mr. Gerhard continued:

"Economy demands that the number of types of fixtures should be restricted. A beginning should be made by abolishing entirely all fixtures and fittings which are either not strictly sanitary, or are actually unsanitary or are mechanically imperfect. In this category belong unsanitary bubble fountains, the secret basin waste valves, the short hopper and washout waterclosets, and water closets with local vent attachments, not required where the bathroom or the water closet compartment are provided, as they always should be, with proper ventilation. In this way restrict the types of fixtures to a few from which to make a selection.

"Unrestricted variety of fixtures and fittings has a tendency to increase prices unduly, because it compels manufacturers and supply houses to keep a large stock on hand, which in turn requires storage space, patterns, working capital, etc. Manufacturers must admit that reducing the present confusing multiplicity of styles and applying standardization to those parts of fixtures, which connect with the water and waste system, would tend to a lowering of prices of their products, because overhead expenses would be considerably reduced.

"In this connection I may refer to the Standard Specifications for Plumbing Fixtures, prepared by the Board on Uniform Plumbing Specifications for the U. S. Treasury, War and Navy Departments.

"Greater uniformity and a smaller variety of styles would simplify and cheapen the cost of plumbing installations. But I would go a step further. I contend that it should not be necessary hereafter, when buying finished products from manufacturers to have them assembled and fitted, at great additional cost to the owner, on the job. The fittings selected should be promptly assembled with the selected fixture at the manufacturing establishment, so that even should it be considered necessary—for greater safety and convenience in shipping—to take down and disconnect the fittings, the entire fixture, as illustrated in plumbing catalog, could be reassembled by the journeyman plumber in a few minutes instead of requiring hours and hours to do this at the expense of the owner."

PLANS FOR STATE HIGHWAY TREE PLANTING

AMBITIOUS plans for roadside tree planting and beautification are being perfected through co-operation between the California Highway Commission, county authorities, State Board of Forestry, and State University. Recently an inspection trip to San Diego county was made by Mr. Solon Williams, member of the State Board of Forestry

and Mr. M. B. Pratt, State Forester, and a plan arranged with the county for the progressive planting of the State highway from the Orange county line south to the city of San Diego and from this point to Pine Valley on the San Diego-El Centro lateral, a total distance of about 80 miles. The San Diego County Supervisors have appropriated $1000 to start the work. The species of trees recommended vary according to soil and climatic conditions and include European sycamores, Monterey cypress, desert gum, Australian beach, blackwood acacia, flowering eucalyptus and live oaks.

The Forestry Board and Highway Commission are working with the Fresno County Supervisors on a tree planting plan to cost about $2500.

Yolo County planting of 2920 trees on State Highways has been completed and the total cost was found to be 42 cents per tree, nursery stock furnished free by the Forestry Board at its nursery.

Since the active movement to plant roadside trees commenced, 62½ miles of State highway, distributed in six counties, have been planted with approximately 8000 trees. The maintenance cost runs from $50.00 per mile per year in the valley sections to over $300 per mile per year on desert sections. However, maintenance cost decreases with the age of the trees and in a few years becomes little or nothing with the exception of cost of occasional trimming. The trees have a value both in protection to the highways and beautification of the landscape, far beyond the probable cost of propagation.

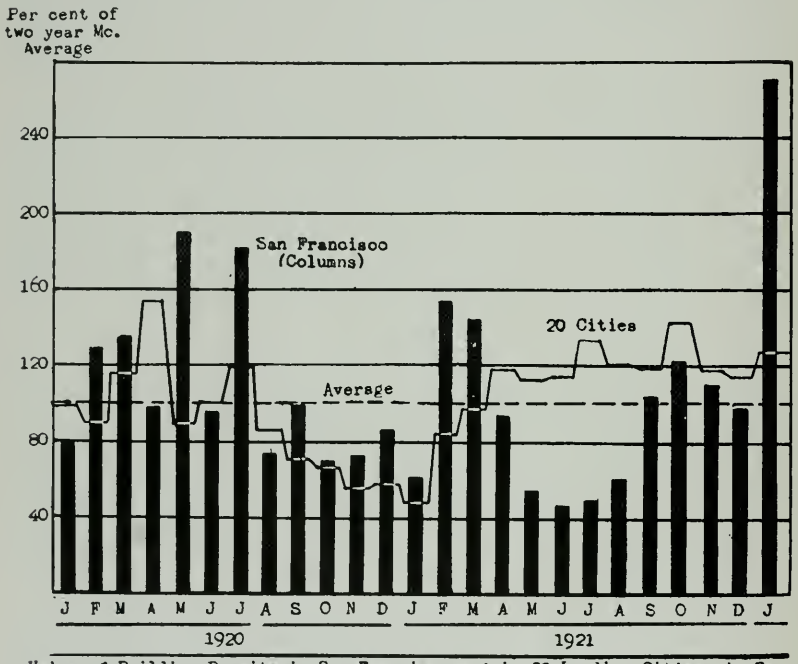
NEW ROOFS MADE FROM OLD RAGS

WHEN mother, with characteristic impatience at house cleaning time, drags forth from the clothes closet father's long disused or, perhaps, recently discarded fishing togs, or gives the contents of the garret to the rag man, she little realizes perhaps how much she is contributing in the effort to overcome the housing shortage. Old rags may be a poor shelter for the human body but American ingenuity has made of them an exceedingly artistic, fire-resistent and servicable shelter for the human habitation.

From rags to roof is a far cry. But nevertheless old rags are now covering more American houses in the form of roll roofings and prepared shingles than all other types of roofing combined. Two-thirds of all roofing requirements in the United States are now supplied from asphalt materials known as "prepared roofing," the product of a novel and typically American industry that has been developed within the past few years.

The thousands of tons of rags consumed daily by this industry are obtained through dealers in all parts of the country and, upon their arrival at the factory are sorted and reduced to a pulp, similar to that used in the manufacture of paper. This pulp is then transformed into a fabric or felt, of long fibre and great durability. Hot asphalt is forced through every pore and fibre of the fabric and the combination is then coated above and below with asphalt so as to make it proof against decay and leakage. Because asphalt is a substance that does not dry out, the roll roofings or the shingles which are cut from this fabric do not crack or split. They are resilient and pliable and do not break from their moorings. As they contain no materials that freeze or rust they are also proof against frost. The roll roofings or shingles are covered

with a crushed slate or rock surface in attractive colors which shields them from wear and further preserves the fabric against the ravages of the weather. During manufacture the crushed slate or rock surface is imbedded in the asphalt as firmly as pieces of marble are imbedded in a mosaic floor. The shingles are made in different sizes and in three colors—red, green and blue-black. By using appropriate colors or different combinations of colors it is possible for the home builder to get not only a fire-safe and a serviceable roof but one that can be made very artistic and that will blend nicely with the surrounding landscape.



Value of Building Permits in San Francisco and in 20 Leading Cities, in Per Cent of the Monthly Average for 1920 and 1921.

BUILDING IN SAN FRANCISCO

From an Index of the Associated General Contractors of America.

BUILDING was at an unusually low ebb last summer in San Francisco, due mainly to the fact that the building industry was practically deadlocked because of a disagreement between the trade unions and the contractors in regard to the wage scale.

The columns in the accompanying diagram show the value of building permits issued each month during the past 25 months in per cent of the average monthly value of building permits for the two years 1920 and 1921.On March 31, 1921, a board of Arbitration announced a wage scale which made substantial cuts in the prevailing rates instead of increases as the men had demanded, whereupon the unions refused to accept the award and struck.

The contractors in alliance with the Chamber of Commerce and other business organizations put into effect what is called "The American Plan" which is essentially merely the open shop principle. The final effect was the breaking of the strike and a resumption of building operations on a large scale. During September, October, November and December, the building permits issued were approximately equal to the average monthly rate for the entire period covered by the diagram, followed by a tremendous increase in January of this year.

The irregular line in the diagram shows the way in which building permits were distributed during that period, in 20 of the largest cities of the country. Assuming that San Francisco's building should have conformed to this general average, it is clear that January of this year is the first month since March, 1921, when building permits have been up to par in that city. The tremendous increase in January seems to indicate that "The American Plan" is a success, but not until several more months have passed will we be in a position to judge of its ultimate effect.

The very great increase in value of permits in January suggests a sudden release of work held up pending the settlement of labor difficulties, rather than the establishment of a new level of building activity. The value of permits in San Francisco in 1921 was 83 per cent of that in 1920, whereas for the 20 cities the 1921 figure was 123 per cent of the 1920 figure. In the 20 cities the January permits were 11 per cent greater in value than the December permits, while in San Francisco the corresponding increase was 175 per cent.

In the 20 cities the January permits were 27 per cent above the average monthly figure for the previous two years, while in San Francisco they were 171 per cent above.While these large figures are in themselves very encouraging as indicating a marked revival of San Francisco's building industry, it is hardly to be expected that they will be duplicated in succeeding months.

PRICES OF PORTLAND CEMENT IN 1921

Preliminary estimates made by the United States Geological Survey from reports of representative producers of Portland cement show that the average factory price per barrel of Portland cement excluding cost of container in the United States in 1921 was approximately $1.87.

The prices by districts were as follows:

District.	Average factory price per barrel in 1921.
Eastern Pennsylvania and New Jersey	$1.72
New York	1.90
Michigan and northeastern Indiana	1.85
Illinois and remainder of Indiana	1.68
Western Pennsylvania and Ohio	1.73
Maryland, Kentucky, Virginia and West Virginia	1.83
Alabama, Tennessee and Georgia	1.94
Iowa, Minnesota and Missouri	1.77
Kansas Nebraska, Oklahoma and Texas	2.15
Colorado and Utah	2.33
California	2.35
Washington, Montana and Oregon	2.51

The average net factory price received per barrel for the whole country in 1920, as shown by reports received from all producers, was $2.02.

RECENT DEVELOPMENTS IN CONCRETE

COLONEL H. C. Boyden in a recent address before the Illinois Society of Architects mentioned that while the art of making concrete is an old one it has been but very recently that serious large scale investigations of its structure and the real effects of various combinations of the ingredients have been undertaken and that laboratory studies have brought out the following important facts regarding the ingredients of which concrete is composed.

If sand contains one thousandth part of organic impurities in terms of the weight of the sand the strength of the concrete will be reduced over 25 per cent; and suggested the importance of the use of the colorimetric test for organic impurities for all sand used for concrete work.

Laboratory tests also show that round sand makes a better concrete and requires less cement than sharp sand and that the size of the sand particles is relatively unimportant if the correct amount of cement is used.

Colonel Boyden called particular attention to the importance of the water content, mentioning that it is in reality of equal importance as the cement in obtaining good concrete and yet is often the most carelessly used and most loosely specified of all the aggregates, generally neglected in all specifications and frequently not even reported in the published data of concrete tests.

Laboratory tests show that the temperature of the mixing water has very little to do with the strength of concrete; that the use of hot water, however, is a most valuable aid in removing frost from the aggregates in cold weather owing to its high specific heat and may be used without danger of harming the concrete. Hot water tends to hasten the hardening of concrete.

With regard to proportioning concrete, recent investigations have brought out the following facts:

That the present method of designing concrete mixtures by using arbitrary volume is wrong; that there is one single proportion that will give the best results with a mixture of given fine and coarse aggregates, and that adding to or reducing the amount of cement is of value only as it affects the relative quantity of water required to make a workable plastic mixture and that the water-ratio is the most important element of a concrete mix.

The water ratio as used by the laboratory is the ratio of the volume of water to the volume of cement in the batch. If one cubic foot of water is used for each sack of cement the water-ratio is called 1.00. The use of more cement in a batch does not produce any beneficial effect except for the fact that a plastic workable mix can be produced with a lower water-ratio. The reason that a rich mixture gives a higher strength is not because more cement is used, but because the concrete can be mixed with a water-ratio that is relatively lower for the rich mixture than for the lean one. If advantage is not taken of this possibility of reducing the water-ratio the additional cement in the richer mixture is wasted.

In order to make these principles available to architects and other users of concrete, the Portland Cement Association's Laboratory has worked out tables of the proportions and quantities required to produce

concrete of compressive strength from 1500 to 4000 lbs. per square inch at 28 days.

The quantities shown in the published tables are considerably less than those shown in any previous published table due to the fact that they are absolutely net quantities based on laboratory methods of measurements of the aggregates. **For this reason the quantities given should not be used for estimating without the addition of proper allowances for waste and the differences due to the practice of measuring aggregates in a loose condition when making field concrete.**

It has been found that the less water used as long as the mixture is plastic and the aggregate is not too course for the amount of cement used the stronger will be the concrete. This does not mean, however, that the amount of water can be reduced too far nor that in actual construction it can be reduced to a point that will give the maximum strength shown in laboratory tests. There is another factor that must be taken into account in construction and that is, the workability of the mix. In general terms, the lowest water-ratio should be used that will give a workable mix.

Within the range of plastic mixtures the strength falls off very quickly with the addition of a small amount of water; so much that in a one bag batch the addition of one pint of water more than is necessary to give a workable mix produces a loss in strength as if two or three pounds of cement had been left out. It must not be inferred, however, that a very lean mix with a small amount of water will give as strong a concrete as a rich mix with the same amount of water because a higher water-ratio is required to produce a workable mix with a lean mixture, thereby causing a loss in strength.

The very wet sloppy mixtures that are being used in building construction work may seem economical from the contractor's point of view, but they are certainly extremely wasteful from the designer's and owner's point of view, since in many instances 50 per cent to 60 per cent of the possible strength of the concrete is being thrown away and while it may not always be practical to reduce the amount of water to the ratio necessary to give the maximum strength, yet it certainly can be cut down below the amount commonly used and the additional strength thus given will be of advantage in the design of concrete structures. The designing engineer figures on the compressive strength of 650 lbs. per sq. inch and expects to get a factor of safety of three, but he does not get it with the sloppy mixture often used. By cutting down the water to the proper ratio, a factor of safety of five or six can be secured, or the present allowable unit stresses can be raised.

In order to have a simple method for determining the proper consistency in the field a slump test has been devised. A metal container 4 inches in diameter at the top, 8 inches at the bottom and 12 inches high has been adopted as a standard. This is filled with the concrete to be tested which is carefully worked with a pointed metal rod while it is being placed. The form is immediately lifted off and the settlement or slump measured.

The proper slump for a mix to be used for a concrete road surface is ½ inch to 1 inch; for mass work from 1 inch to 1½ inches and for concrete used in building structures with reinforcing bars 2 inches to 2½ inches. In some classes of reinforced concrete work increased plasticity or flowability may be needed. It must, however, only be obtained

by adding cement and water in such quantities as to maintain the proper water-ratio; otherwise a serious loss in strength will occur.

The time of mixing is a matter of importance in obtaining good concrete and as this factor controls the output of the mixer, it affects the cost of the concrete; consequently, there is an unfortunate tendency to reduce the time of mixing, a practice which cannot be too severely condemned because it only results in a material loss in the strength of the concrete and a lack of uniformity. Exhaustive tests made on concrete mixed in a batch mixer from 15 seconds to 10 minutes show a rapid increase in the strength for the first minute and a slightly smaller increase for the second minute after which an increase in strength is less pronounced as the time of mixing increases.

These tests show the necessity of mixing the concrete at least 60 seconds after all of the ingredients, including the water, have been placed in the drum of the mixer. There is no question as to the advisability of using a batch meter on the mixer providing one can be found that cannot be tampered with in order to avoid controversy over the time of mixing and to insure a full mix. When a mixer is manufactured that will not permit discharge until a certain number of revolutions have been made at a certain speed, this problem will have been solved. The revolutions per minute of the mixer within the limits of 12 to 25 R. P. M. have but little effect on the strength of the concrete.

The effect of proper curing conditions upon the ability of concrete to withstand abrasion has been very strongly brought out by numerous tests of the laboratory. There is probably no factor in the handling of concrete that so affects its wearing ability as that of proper protection while curing or hardening. While it is true that all of the factors that tend to produce strength in concrete also tends to increase its wearing qualities; nevertheless all tests show that other factors being the same, concrete which has been properly protected will show more compressive strength and much less wear than concrete which has been allowed to dry out too quickly.

One of the principle causes of the poor wearing resistance that is often found in concrete floors is due to the practice of allowing them to dry out without proper protection during the hardening period. Concrete floors should be covered and kept moist just as outside roads and pavements are protected. Why throw away one-half of the life of concrete floors by failing to observe this rule? Concrete floors should be kept moist and protected for a period of at least twenty-one days in all cases.—Monthly Bulletin, Illinois Society of Architects.

SHOULD PASSENGER STATIONS BE ARCHITECTURAL MONUMENTS?

IT was the late Charles Mulford Robinson, if our memory serves us correctly, who first suggested that as the gate to the walled city of other days was a monumental thing, symbolizing the strength and magnificence of the city, and impressing them alike upon stranger and citizen as they passed, so should the modern passenger station be planned to impress arriving and departing travelers.

In this suggestion we believe that Mr. Robinson was right. The fact that he sometimes appeared—particularly to the hard headed engineer

—as an impractical idealist does not brand all his great conceptions as flights of fancy, impossible of realization.

This suggestion of Robinson's is called to mind by the announcement that the new union passenger station at Cleveland is not to be of the monumental type. We are not sufficiently familiar with the Cleveland situation to criticise the decision in the particular case. The great cost of the indispensable features of the station, the present hard-up condition of the railroads, or other reasons may justify the limitations imposed; but the necessity for them is a proper subject of regret, and it is to be hoped that similar necessities will not arise in other cases.

As we see it, the logic of the monumental railway station and of most other public and quasi-public structures is this:: America's productive power is now vastly beyond that necessary for the mere supplying of the physical needs of food and shelter. The excess, quite obviously, is spent for the most part on pleasures and luxuries; and of these, few indeed are as thoroughly wholesome as is the enjoyment of beautiful architecture.

The theater and the high class hotel are made beautiful as a business necessity. No one questions that they should be so; but for other buildings there is often criticism—"These gorgeous bank buildings show that the banks are making too much money." "Why don't the church people help the poor instead of spending their money for steeples and colored windows?" "The railways ought to lower their rates instead of building depots like palaces." The reason that such criticisms receive and deserve so little attention is that they approach the subject at the wrong point. If it were true that the money saved on imposing architecture would be turned to the benefit of those most in need, we should say, "Right! Let us postpone such luxuries until all people are supplied with the more vital things." But neither business nor personal ethics in America has yet reached so high a plain. It is inconceivable that the curtailing of these "luxuries" would materially benefit the people most in need of help. In fact we think it most likely that whatever savings might be made would be spent in ways of less benefit to the poorer citizen. We grant the need of a better distribution of wealth and income, but not the need of dispensing with the beautiful and inspiring in order to get it. Limitation of the railway station is a particularly inconsistent way of improving distribution, because the station is so completely a place for the equal use of rich and poor. It may even be the only building of magnificence entered by some of the latter; and we think that its influence is good, for the poor man has not merely the privilege of looking at it; he actually uses it; and if he is a man of appreciative sense and feelings, he takes pleasure in the knowledge that it is intended for his use. How many commutors have not certain feelings of proprietorship and pride in the fine station through which they pass daily? One can note the pride in the way they show it to friends, and the proprietorship in the references to it as "my" or "our" depot.

We hope that there will not be many new stations or other public buildings limited by necessity to "purely utilitarian" requirements.—Engineering and Contracting.

MANY STORIED SCHOOL BUILDINGS NO LONGER POPULAR.

By SAMUEL A. CHALLMAN

State Inspector of School Buildings, Minnesota.

THE modern school building with its regular outline, its batteries of windows, its well distributed exits, and other familiar features has been gradually evolved from the rather picturesque, turreted, and high gabled structure in which the up-to-date city or village of twenty-five years ago took particular pride. The present type is, however, none the less beautiful than the old, but it is less ornamental. While the old type was designed from the outside in, the new type is designed from the inside out. The floor plan of the new type governs in the main the features which characterize the exterior, whereas the elevations in the old type fixed to a large extent the interior arrangement.

In consequence our newer buildings are better adapted to their purposes. The lighting is better, the dimensions of the rooms more in keeping with usable space, the height of the ceiling proportioned to actual needs, the stairways easier to climb and more advantageously located, the toilet rooms eliminated from the basement, the corridors narrowed to actual requirements for movements of classes, and a number of other equally desirable features given judicious and befitting recognition.

One idea that until recently has clung tenaciously to our plans has been that of basements under our schoolhouses. Though few reasons were ever advanced for the use to which they might be put, except for storage, generally of inflammable material, the idea that such rooms were desirable was quite generally accepted. Until within recent years they were seldom given any interior trim or used for a particularly desirable purpose but as manual training, home economics, agriculture, and gymnasium exercises began to find their way into the schools they were put into as usable shape as possible so as to provide quarters in which these subjects might be presented. In most instances the rooms were low, dark, and poorly heated and ventilated.

As the subjects gained in popularity, the basement rose out of the ground, until its floor level was not much more than three feet below grade.It advanced from the rank of basement to the more euphonious designation of ground floor. It attained some standing by being well lighted, satisfactorily heated, and ostensibly, at least, provided with ventilation. The first floor which in the old type had been only three or four feet above grade now moved up, until it was ten feet above the surface of the ground. The primary children, who in the old type had climbed six or at most eight steps, in order to reach the floor on which their rooms were located, were now required to climb twenty steps. The first floor reached an altitude which to the lay mind seemed a misnomer and the danger to life in a non-fireproof building of this type soon awakened serious concern in the minds of those who realized what it would mean to get small five, six and seven-year-old children out of such a building in case of fire.

Rooms with floor levels below grade are not looked upon with favor. They generally require a defense when their location is called in question for any purpose except storage. Many people think that a gymnasium may well be in the ground, and, if the room is well lighted, and properly ventilated, the floor and walls dry, there is perhaps no real valid

reason for opposing this location of the gymnasium. The fact remains, however, that more than one gymnasium thus located has been poorly lighted, inefficiently ventilated, and has developed hummocked floors and damp walls. It would actually seem that in order to overcome these handicaps, it is necessary to expend more money for the construction of these rooms than for rooms above ground. If this is actually the case, then why spend more money for less desirable rooms below grade than may be secured above grade?

These considerations of safety, satisfactory service, and questionable economy have led a great many school boards to eliminate basements altogether, except to provide for the mechanical equipment. The first floor is then two to two and a half feet above grade. The small children are not required to climb high stairs. All the subjects of the curriculum are placed on a parity. Industrial courses are given as good quarters as academic. When changes become necessary either may yield space to the other.

When conditions of site and number of pupils do not demand a three-story structure, two stories only are erected. Such two-story buildings are economical of construction, facilitate rapid egress from the building, fit well into the residence section of any city, and, when designed by competent school architects, add materially to the aesthetic effect which good architecture always produces.

The tendency is one which has awakened much favorable comment among educators and architects alike. It has so many sensible considerations in its favor, that it would seem reasonable to suppose that the type will become general as new buildings are being planned.

UNIQUE OFFICE BUILDING BEING ERECTED IN BERLIN
Courtesy Leslie's Weekly

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Seattle Architects Hold Successful Exhibition

Members of the American Institute of Architects, Washington State Chapter, are holding their annual exhibition in Seattle this month and from all accounts the exhibition is one of the best ever held in the Northern city. The display includes photographs of completed work, water color sketches, pen and ink perspectives and floor plans, in addition to some interesting examples of sculpture, wood carving, metal work, pottery, furniture and interior decoration.

A jury has selected 20 or more of the best buildings shown at the exhibition and these will be illustrated in the May number of The Architect and Engineer with appropriate discussion by Mr. Carl F. Gould, president of the Washington State Chapter.

Lack of "American" Architecture

Mr. Guy Haugh of Indianapolis, addressing the Cincinnati Building Owners' and Managers' Association, at a recent meeting, declared that an "American" type of architecture is sadly lacking in this country and expressed hope that some day a new type, purely American, would be developed, ranking with any school of any age. Mr. Haugh predicts that if such a type of architecture ever materializes it will undoubtedly be produced in the Middle West and will be evolved from necessity or by the demand of living conditions. He thinks the Middle West represents nearer the American type of people.

Mr. Haugh gives the Americans credit for being "the greatest builders on earth," but in the next breath he takes them off their high pedestal by declaring that our architects are utterly lacking in originality—"using and mixing the different periods of architecture sometimes with beautiful results, but more often with outrageous desecrations—all depending on the idea of the man who involved them."

We think Mr. Haugh is not very well informed. He would do well to come to the Pacific Coast and look around a bit. We have an original type of architecture in California and while it may not be exactly American it has been developed to fit our American ideals and its possibilities for charm and beauty seem to have no limitation.

Whose Duty is it to Insist Upon a Quantity Survey?

ARCHITECTS, engineers and contractors have at last gone on record in favor of the making of quantity surveys of buildings at the owner's expense. It has long been the custom of civil engineers to prepare quantity surveys, commonly known as "bidding sheets," for construction work

other than buildings. In fact nearly every class of civil engineering structure, except buildings, is quantified by the engineer prior to submitting it to contractors. How does it happen, then, that buildings have hitherto been an exception to this rule? The reason would seem to be found in the fact that supervising architects are commonly paid for their services on a percentage basis and not on a salary basis. It is but natural, therefore, that an architect should shift onto the contractor's shoulders the expense burden of preparing the data for estimating the cost of construction. If only one contractor were invited to bid on each building, there would be no economic loss from this practice, but ordinarily several contractors submit bids, and in doing so each one duplicates the quantity survey work of the other.

Now that the American Institute of Architects has indorsed the plan to have the building owner pay for a quantity survey, we suggest that the architects increase the percentage charged for their services to provide for the cost of making a quantity survey, and that they do not leave such a survey optional with the owner. The omission of a survey is conceded to be an economic mistake. If so, why countenance it any longer? "Any man proposing to spend a considerable sum of money in building should insist on a quantity survey as one of the most certain means of economy that he can display," says the Journal of the American Institute of Architects. True, but will the average owner insist upon a quantity survey? We doubt it, says the editor of Engineering and Contracting, because the average owner knows very little about building economics.

If so, the insistence should come from the men whose specialty it is to study building economics, namely, architects and engineers. They should carry their insistence to the point of refusing to take charge of building construction unless such a survey is made part of their work.

Notes and Comments

A Plea For Zoning.

The diversified architecture which is now characteristic of our Nation, and the extremes to which exigencies, due to unrestraint, have prompted the profession to go, have had an influence in bringing about the determination of nearly all of our great American cities to adopt Zoning plans.

While the primary object of zoning is to control the purpose, manner and method of using property, it will be recognized that under such control, harmonious and symmetrical development, in a considerable degree at least, must result.

We will concede, I believe, that the city that develops along the most symmetrical and conforming lines is the most beautiful, and when, along with such development, proper regard is exercised to protect health and public welfare, it may be safely said that that community architecturally has attained a condition approximating the ideal.

That the architecture of a city has a distinct influence upon the public mind of that community cannot be denied. It creates harmony or discord in proportion to the approximation of or departure from architectural perfection. It is like the blending of colors in art, or the mathematical and proportional arrangement of sound in music, and even though not skilled in these arts, one may quite readily recognize their imperfections. So, it follows then that the architectural development of a community has much to do with the contentment, delight and satisfaction of its people.—E. S. Goodwin.

Concrete Roads

The advocates of concrete roads declare that these are practically everlasting, but that is the claim made by concrete men for everything constructed of their material. Those who have traveled over concrete roads, laid for two or three years only, may well wonder if the cracks and disintegration brought about by this short period of use is the utmost limit of their deterioration. Of course, modern heavy motor truck traffic is tremendously destructive to road beds, but it is a question whether we have yet found the ideal method of highway construction. There is a limit to the amount the country can spend on road-building, and we cannot know too soon whether concrete roads are actually worth their tremendous cost. The recent low bid for constructing about 60 miles of concrete roads for the Pennsylvania State Highway department averaged no less than $53,333 a mile. One of the organs of the motor industry resents any imputation that this represents a high cost, and declares that the "real truth of the matter is that concrete roads are low-priced. The more they cost the less they cost. Paradoxical? Yes, but easily understood. The concrete road needs no attention. It is done when it is finished. No up-keep. Few repairs and 100 per cent enciency." This is the usual cry of the interested persons. Instead of glittering generalities from the concrete men and the motor trade, the taxpayers who foot the bills should insist upon knowing the exact cost in dollars and cents of the repairs and upkeep for concrete roads.—Stone.

Striving for Lower Cement and Material Prices

According to newspaper advices from the middle west, over 3000 miles of cement highway construction in eight states, aggregating in value $125,000 000, are being held up by highway officials pending a readjustment of cement prices downward by the cement manufacturers. The statement is made that in case no drop in price is made that road specifications will be changed to another type of hard surfacing. The price against which the officials are protesting is around $1.75 per barrel, mill base.

The price of cement at present made to the California Highway Commission by all the northern mills in California is $2.35 per barrel, mill base, the mills all quoting the same delivered price and absorbing any freight differentials due to differences in distances from delivery points. Among the mills of Southern California, however, a limited competition exists and the mill base price there is appreciably lower.

Before the war the California Highway Commission enjoyed a range of price from $1.04 to $1.40 per barrel, mill base. The peak price on account of war time conditions was $2.70 on September 2, 1920. It has since dropped to $2.35 but is still fully $1.00 per barrel above pre-war prices.

In certain sections of the State a monopoly also exists in sand and rock. The prices of these commodities have not dropped one penny below the peak war time price. Sand was purchased before the war for 25c per ton and rock for 75c per ton. During the war the price was raised to 65c per ton for sand and $1.1[illegible] per ton for rock. These prices are s[illegible] in effect. Wherever possible the California Highway Commission uses local sources for materials but these do not always exist.

The only element entering into highway construction that has approached normal is the cost of labor.

Building Material Prices

Building material prices for the month of February continued practically on the January level, according to the index figures just issued by the Department of Commerce through the Division of Building and Housing. The building material index for February is shown as 158.7 while the index for January was 159.9. The average price for 1913 is used as 100. The following table shows various index figures for the last three months as published by the Division of Building and Housing:

	—Index numbers—		
Commodity	Dec., 1921	Jan., 1922	Feb., 1922
Building material index	160.8	159.9	158.7
Com. brick, kiln, Chicago	180.8	170.1	169.7
Gravel, New York	198.6	198.6	198.6
Hollow tile, Chicago	108.0	128.3	128.3
Com. Lime, U. S. average	211.0	207.8	206.8
Portland cement, plant	148.4	148.4	148.4
Sand, New York	201.7	201.7	201.7
Reinforcing bars, Pittsburgh	109.0	109.0	109.0
Wire nails, Pittsburgh	153.3	143.0	136.1
Structural steel, Pittsburgh	99.3	99.3	99.3
Douglas fir, No. 1, mills	124.9	124.9	135.8
Hemlock, New York	153.8	153.8	153.8
Lath, spruce, New York	207.2	192.6	192.6
Red cedar shingles, mills	148.5	152.0	148.0
White oak, New York	224.5	224.5	216.2
Yellow pine flooring, mills	189.1	181.9	189.0
Plate glass, New York	169.0	169.0	169.0
Window glass, works	231.0	192.5	154.0
Linseed oil, New York	145.9	155.8	176.9
Putty, New York	179.2	179.2	179.2
Turpentine, New York	190.2	212.4	210.9
White lead, New York	181.2	181.2	181.2

Three-Story Apartment House

Plans have been completed by Architect D. A. Riedy, Pacific Building, San Francisco, for a three-story apartment house to cost $35,000, to be erected on Pine street, west of Broderick, San Francisco.

With the Architects

Building Reports and Personal Mention of Interest to the Profession

State Architect Busy

Much new work is being turned out by the Architectural Department of the State of California, Forum Building, Sacramento, and bids for construction of various buildings throughout the State will be advertised shortly. Plans now being prepared include a manual arts and home economics building at San Jose; group of buildings at the Sonoma State Home, Glen Ellen; receiving and treatment building at the Stockton State hospital; three masonry buildings for the State Home of the Blind, Oakland; two cottages for the Berkeley State Home for the Blind; reinforced concrete cottage at the Napa State Hospital, Napa; and other small work. Mr. George B. McDougall, is State Architect and Mr. George Adams, Assistant State Architect.

New Work in Mr. Baumann's Office

Architect H. C. Baumann, 251 Kearny street, San Francisco, has moved to larger offices, necessitated by a constantly increasing clientele. New work in Mr. Baumann's office includes a $25,000 frame apartment house for Mr. F. Wilbur on 20th avenue, north of Geary; two flat buildings, one for Mr. John Schroeder at 26th and Dolores streets, and the other on 14th avenue for Mr. C. Littlepage; also two residences in Burlingame for Mr. H. Johnson, and six homes in 44th Avenue, San Francisco, for Messrs. Lyon & Hoag.

Residences and Apartments

Architect L. H. Ford, 306-14th street, Oakland, has completed plans for a two-story frame apartment house on Fruitvale avenue and Hopkins streets, Oakland, which will cost $15,000. The owner is Mrs. A. Zak. Mr. Ford is at work on plans for a bungalow court which will accommodate 48 families and which will be built in Alameda at an estimated cost of $100,000. Plans for several homes have also been made by Mr. Ford, including a $7000 house on Lakeshore Highlands.

Architect to Build Home

Mr. G. Albert Lansburgh, San Francisco architect, has bought a lot 51x132 on the north side of Pacific avenue, between Baker and Lyon streets, San Francisco, upon which he will erect a home for himself to cost not less than $50,000.

Forms Partnership

Messrs. James S. and Chas. L. Dean, who have had charge of the drafting room in connection with the new school work at Sacramento have formed a partnership for the practice of architecture with temporary quarters in the Free Public Library Building in Sacramento. They will complete the school work on hand and probably will be in charge of future school additions and extensions. They expect to let contracts in the near future for a five-story reinforced concrete warehouse on "K" street, between 6th and 7th streets, Sacramento, for the Breuner Company.

Apartment House and Alterations

Architect Nathaniel Blaisdell, 255 California street, San Francisco, has completed plans for a three-story brick apartment house to be built on Market street, near Guerrero, and to contain twenty-seven apartments of two and three rooms each. The estimated cost is $85,000. Mr. Blaisdell has also made plans for alterations and additions to a three-story Class "C" loft building at Clay and Battery streets, San Francisco, for Harriet D. Kittle.

Hearst Plans New Building

The five-story reinforced concrete building owned by the Sharon Estate at Annie and Jessie streets, San Francisco, has been purchased, together with the Builders' Exchange Building to the west, to provide room for the mechanical equipment of the Examiner. It is stated that the Builders' Exchange Building will be razed and a five-story structure erected on the site. Miss Julia Morgan is the architect.

Town Hall and Library Addition

Mr. Birge M. Clark of Stanford University, Palo Alto, has prepared plans for a $40 000 reinforced concrete addition to the Palo Alto Public Library building and a $20,000 addition to the Palo Alto City Hall.

Merced Hospital

Architect Ira W. Hoover, Planada, California, is preparing plans for a two-story hollow tile hospital for the Mercy Hospital Society at Merced.

Passing of Octavius Morgan

Mr. Octavius Morgan, one of the pioneer architects of Southern California, died suddenly of heart disease at his home, 819 So. Westlake Ave., Los Angeles, March 29. Mr. Morgan had been in apparently good health and spirits, having attended a meeting of the Allied Architects Association during the day and the theater in the evening.

Mr. Morgan was senior member of the architectural firm of Morgan, Walls and Morgan. He was born in Canterbury, Eng., Oct. 20, 1850. For two years after coming to the United States he was engaged in mining in Colorado, Wyoming, Idaho, Utah and Nevada and in 1872 secured a claim on Lytle creek, San Bernardino county, California. In 1872 he moved to Los Angeles and became associated with Mr. R. F. Kysor in the practice of architecture until 1886, when Mr. Kysor retired. Mr. Morgan then formed a partnership with Mr. J. A. Walls and in 1910 Mr. Morgan's son, Mr. O. W. Morgan, became a member of the firm. Mr. Morgan had for his clients many of Los Angeles' most prominent citizens. His firm designed many buildings in Southern California, including the Sisters of Charity hospital, Hollenbeck Home for Aged, Farmers & Merchants National Bank, I. N. Van Nuys, W. P. Story, Hollingsworth, Title Guarantee, Haas and Stock Exchange buildings; Morosco theater, Van Nuys and Savoy hotels and The Little Theater.

Mr. Morgan was a leader in his profession and active in its affairs, being a Fellow of the American Institute of Architects. He was past president of Southern California Chapter and former director of the Institute; past president of the Engineers & Architects Association, member of State Board of Architecture; and was a Mason and Odd Fellow and member of California and Jonathan clubs.

$75,000 Apartment House

Architect Edward T. Foulkes, Crocker Building, San Francisco, has completed plans for a six-story apartment house to be built at Sutter and Taylor streets, San Francisco, for Mr. George Smith. Mr. Foulkes also has recently completed plans for two branch bank buildings for the Bank of Italy.

Hardwood Man Visits the Coast

Mr. George Strable, President of the Strable Lumber & Salt Company of Saginaw Michigan, has been spending the month in California, making his headquarters in Oakland, the guest of Mr. George Brown, President and Manager of the Strable Hardwood Company, of that city.

School and Residence Work

Mr. Henry C. Smith, Humboldt Bank Building, San Francisco, has quite a little school work on the boards, including the following:

School building for the San Lorenzo Grammar School District to cost $48,000.

Reinforced concrete school for the Glen Ellen School District to cost $35,000.

One-story frame school building for the Irvington School District to cost $40,000.

Mr. Smith is also preparing plans for a $20,000 country house to be built at Los Gatos, for Mr. Lewis Bruce. Plans have been completed by Mr. Smith for alterations and additions to the Bank of Hayward to cost $25,000.

Class "A" Building

Architect Sam Heiman of San Francisco has opened a Los Angeles office at 915 Loew State Building. Mr. Heiman is preparing plans for a 12-story class "A" store and loft building on the west side of Spring street, between Sixth and Seventh streets, to be erected for Dunn-Williams Co., of San Francisco. The upper stories will be subdivided into offices for large financial institutions. Macdonald & Kahn will erect the building which is to be completed by next January.

Union League Club Building

Plans have been completed by Architect T. Paterson Ross, 310 California street, San Francisco, for a seven-story and basement Class "A" club building to be erected on the south side of Post street, between Mason and Taylor streets, San Francisco, for the Union League Club. The building will cost $250,000. Mr. Ross has also completed plans for a large community apartment house and for several residence flats.

Miller & Warnecke Busy

Besides two brick business buildings to be erected in Paso Robles, and for which bids have been taken and contracts awarded, Architects Miller & Warnecke of Oakland, have prepared plans for residences costing from $5,000 to $15,000 each for Mr. A. Magerstat at Rock Ridge Mrs. Carrie Onstott at Sutter, Sutter county, Mr. Neil Ross at Stockton, Mr. Ralph Belding at Guerneville and Mr. O. E. Gripp at Oakland.

Emanuel Sisterhood Building

Architect Julia Morgan of San Francisco, is preparing plans for a reinforced concrete and brick housing unit for the Emanuel Sisterhood. It will occupy a corner lot at Page and Laguna streets, San Francisco, and will cost $125,000. There will be accommodations for 60 girls.

Marine Architect's Invention

Mr. David W. Dickie, San Francisco marine architect, recently announced an innovation in marine bearings. In the new work launch of the harbor commissioners, now building at the Pacific Boat Works in East Oakland, he has eliminated the lignum vitae stern bearing and has "infused" rubber. Mr. Dickie claims to have tested the thing carefully. He says that he got the tip from oil drillers, who found rubber was not affected by sand. According to Mr. Dickie, the rubber bearing will make an enormous saving in installation, in wear and in periodical shaft withdrawal.

California Anti-Shingle Law

The wooden shingle men of California have been successful in securing the requisite number of names to their petition for a referendum vote on the so-called "housing bill" passed by the last legislature, which contained a clause forbidding the use of wooden shingles on roofs of buildings. In consequence, the bill which would have become effective on September 1, will remain inoperative until the people express their will at the November, 1922, election.

New Work in Meyer & Johnson's Office

Mr. Albin Johnson of Meyer & Johnson, Bankers Investment Building, San Francisco has recovered from an attack of influenza. New work in their office includes an apartment house at Herman and Buchanan streets for Mr. W. S. McLeod; three dwellings in San Rafael for Mr. James Hyde; a residence for Mr. William Scott and a brick firehouse in Forest Hill for the City of San Francisco.

New School Buildings

Architect William H. Weeks has been commissioned to prepare plans for an auditorium and gymnasium for the Exeter High School to cost $135,000; additions to the Exeter Grammar School to cost $88,000; a six-room and auditorium addition to the Los Altos School to cost $47,000; and a reinforced concrete auditorium and classroom building at Morgan Hill to cost $44 000.

To Complete San Francisco Hotel

Plans have been completed by Architect Kenneth MacDonald, 234 Pine street, San Francisco, for the completion of the five-story brick hotel at Mason and Eddy streets, San Francisco, owned by the Prior Estate and which has been left in an unfinished condition for a number of years. The original plans for this building were made by the late Earl B. Scott.

Architects Dined by Electrical League.

More than one hundred architects, builders and realtors were the guests of the San Francisco Electrical Development League at their luncheon in the Palace Hotel ballroom March 28. The close relation of these men to the electrical industry was emphasized by the various speakers and a closer bond of co-operation was argued.

Mr. Garnett Young, president of Garnett Young & Co., spoke on the necessity of minimizing the burdens of housekeeping by the installation of the proper equipment when homes are built.

Mrs. Halle De Graf, domestic science director of the Prune and Apricot Grower's Association, spoke of the necessity of electrical appliances in the home from the housewives' viewpoint.

Other speakers included: Mr. Clarence R. Ward, president of the State Board of Architecture, Northern Division; Mr. Henry B. Allen, vice-president San Francisco Real Estate Board; Mr. Alvyn Heyman, president Home Builders' Association; Mr. Charles W. Gompertz, secretary Builders' Exchange and Mr. Ray W. Kearney, attorney for the State Commission of Housing and Immigration.

To emphasize the necessity of outlet switches, a clever sketch was presented entitled "The Convenience Outlet."

Passing of Two Architects.

Architect James Osborne Craig of Santa Barbara, died recently at Ojai, following an attack of influenza. Mr. Craig was born in Glasgow and studied architecture in the Royal Academy, London. He came to Santa Barbara in 1915. He was engaged in preparing plans for the restoration of De la Guerra plaza, in Santa Barbara, as a public park at the time of his death.

Architect Fred T. Harris of San Bernardino, died suddenly at his home in that city of heart trouble resulting from an attack of influenza. Mr. Harris was born in San Bernardino in 1875. After graduating from high school he took up architecture and subsequently practiced in Redlands and El Centro, returning to San Bernardino in 1918. His widow and a son, Harwell, student at Pomona college, survive.

Architect to Build Home

Architect Jens C. Petersen, Peoples Bank Building, Sacramento, is preparing plans for a home for himself to be erected on 26th street, Sacramento, at a cost of $7500. It will be of the bungalow type, brick veneer, seven rooms, two baths and garage. Mr. Petersen has completed drawings for the new Arbuckle Grammar School costing $75,000.

Los Angeles $5,000,000 Hotel

A contract was recently awarded to a Los Angeles firm to construct the new Biltmore Hotel for a sum in excess of $5,000,000—the largest single building contract ever let in the Southern City. A San Francisco contracting firm submitted the low bid but the owners thought best to give the job to a local concern which agreed to complete the building in the shortest number of working days. Schultze and Weaver of New York are the architects. With its fourteen stories of more than one and one-half acres each, it will contain 950 guest rooms and the most elaborate arrangement of lobby and service floors in the West.

Approximately 6,000 tons of structural steel will enter into the construction of this building. The electrical equipment of the hotel is estimated to cost $500,000 including elevators, ventilating apparatus, refrigeration machinery, wiring and other electrical devices.

City Planning.

At the February meeting of the Southern California Chapter, American Institute of Architects, Mr. Clarence E. Noerenberg gave a talk on the work of the City Planning Commission, City Planning Association and Regional Plan Conference and urged the members to take a more prominent part in the work of these organizations. Mr. Sumner Hunt, president of the Chapter, and Mr. Chas. H. Cheney, city planning consultant, participated in the discussion. A resolution was adopted authorizing the executive committee to consider the appointment of a city planning committee.

Prof. D. V. Steed, instructor in mathematics at University of Southern California, gave a talk on the "Fourth Dimension."

Says Los Angeles is Not Overbuilding.

Architect Edwin Bergstrom declares in an article published by The Realtor, that Los Angeles is not overbuilding but on the contrary must maintain an average of $60,000,000 worth of construction work each year for the next ten years to meet normal requirements. His statement is based on probable increase in population which he estimates will average 30,000 a year for the decade ending 1930 and the average requirements in building determined by actual increase in population and actual building done during the period from 1910 to 1921.

New Architectural Firm

Messrs. Ashley and Evers are a new firm of architects in San Francisco, with offices in the Holbrook Building. Mr. Ashley was formerly with Architect Smith O'Brien.

Personal.

Mr. Henry M. Greene, formerly of the architectural firm of Greene & Greene, 216 Boston Building, Pasadena, through office reorganization, has assumed entire charge of the business which will be continued at the same address under his name alone.

The firm of Mayo, Cowell and Bisell, associate architects and engineers, has been formed with offices in Stockton and Merced. Mr. A. E. Cowell, member of the firm is surveyor of Merced county.

Mr. W. C. Knighton and Mr. L. D. Howell have formed a partnership as architects and engineers, with offices in the U. S. National Bank Building, Portland Oregon.

Mr. F. H. Ernest Walker, for a year past associated with Mr. Albert Farr, architect in the Foxcroft Building, San Francisco, has resigned to complete his architectural training in a tour of the United States and principal European Countries. At the conclusion of his travels Mr. Walker will practice his profession in Sydney, Australia.

Bank Addition and Hotel

Architects Ward and Blohme will be associated with Architect Herbert A. Schmidt in preparing plans for a $200,000 addition to the San Francisco Savings and Loan Building on California street, San Francisco.

Messrs. Ward and Blohme have also been appointed architects of a five story 150 room hotel at Marysville which is to be built this spring at a cost of $250,000.

Large Apartment House

Architect Edward E. Young, 251 Kearny street, San Francisco, has completed plans for a ten-story Class "A" apartment house having 63 apartments of two rooms each, to be built at Geary and Shannon streets, San Francisco, for M. A. Little. The cost is estimated at $250,000.

Market Street Building

Willis Polk & Company, Hobart Building, San Francisco, have completed plans for a two-story Class "C" reinforced concrete store and loft building for the Provident Securities Company. It will be built on the north side of Market street adjoining the Hobart building, at a probable cost of $36,000.

THE HUNGRY CARPENTER

The carpenter was hungry,
No wages could he draw.
"Alas!" said he, "no cats I see,"
Then sharpened up his saw.
The carpenter was starving.
There was no doubt of it.
No food in sight. Without a bite,
He took a brace and bit. —The Duluth

With the Engineers

Cement Boycott Called Off

Wisconsin state highway department decided that more harm than good would be done by continuing its boycott on cement, and will accordingly proceed with its 1922 construction program. Wisconsin was one of the five states which agreed to purchase no more cement until a price of at least $1.30 per barrel could be obtained. Four hundred thousand barrels were secured at this price but 1,500,000 barrels will be needed for the current year. This has been purchased at an average price of $1.41 per barrel net at the mill; the average price paid in 1921 was $1.80 per barrel. In explanation of the department's decision Mr. A. R. Hirst, chief highway engineer says: "The state highway commission feels that the fight has been carried as far as it is profitable to carry it and that any saving in the price of cement which might result from a continuance of the boycott will be far outweighed by the loss to the industry and to labor resulting from holding up the construction season about to open."

Want State Cement Plant

The Arkansas Chapter of the American Association of Engineers has urged the Governor of that state to investigate the feasibility of building a state cement plant. The following resolution on the subject was adopted by the engineers' convention:

"Whereas, the prevailing price of cement is entirely out of proportion to the price of other construction materials.

"And, whereas, this abnormal price has the effect of retarding construction over the entire state.

"And, whereas, the State of Arkansas has an inexhaustible supply of the best cement-making materials in existence.

"Now, therefore, be it resolved by the Arkansas Chapter of the American Association of Engineers in Convention assembled that the Governor be respectfully requested to initiate an inquiry into the feasibility of building a state cement plant to be operated with convict labor, thereby securing, at a minimum cost, cement for use in public road and street construction."

The same convention urged the development of the deposits of natural asphalt rock which exists in Arkansas, for road construction and expressed the opinion that "the present good roads and public works construction progress is being hampered by excessive freight rates."

Reno Hotel

Architect F. J. De Longchamps is preparing plans for a five-story hotel to be built in Reno for Mr. George Wingfield.

San Francisco to Entertain Engineers

At a meeting of the Board of Directors of the American Society of Civil Engineers held in New York City recently, it was decided to hold the autumn meeting, not only of the Board of Direction, but of the entire Society, in San Francisco on October 18, 19 and 20, 1922. The meeting will be devoted to a Symposium on Water Power. After a two-day session devoted to technical papers and discussions, an excursion will be made to one of the power projects in the Sierra Nevada Mountains. San Francisco is represented on the directorate of the Society by Messrs. Walter L. Huber, director for Northern California and Nevada, and C. E. Grunsky, who was elected vice-president at the January meeting.

Engineer Brings Suit

Mr. W. B. Larkin, former city engineer of Tracy, has brought suit against the trustees of that city for $8000 alleged damages due to the cancellation of an agreement to employ him for all engineering and inspection on certain street work at 6 per cent of the contract price of the work, which was estimated to be about $200,000. Mr. Larkin claims that after he had submitted his recommendations on the proposed paving, the resolution adopted by the board of trustees authorizing his employment was rescinded. This action he claims discharged him from his duties without reasonable notice and without a hearing.

To Investigate Water Resources.

Four leading hydraulic engineers of California have been called into consultation by the State Department of Engineering to advise the department in its study of run-off of the water sheds of California in connection with the survey of the water resources of the State, provided for by act of legislature. They are: Mr. C. E. Grunsky of San Francisco; Prof. C. D. Marx of Stanford University; Mr. Louis Hill of the firm of Quinton, Code & Hill, Los Angeles; and Mr. H. D. McGlashan, district engineer of the Water Resources Board of the U. S. Geological Survey. A study of the run-off of 95,500 square miles of watershed is contemplated, extending the comparisons over a period of 50 years.

Builders Exchange New Officers

Mr. William H. George, manager of the Henry Cowell Lime and Cement Company, has been elected president of the San Francisco Builders' Echange, succeeding Mr. Charles W. Gompertz, whose term had expired.

Other officers elected for the ensuing year are: Messrs. D. J. Sullivan, first vice president; Joseph B. Keenan, second vice president; George Bowen, third vice president; R. J. H. Forbes, secretary, and Alexander Mennie, treasurer.

The board of directors, who will have charge of the affairs of the exchange for the coming year, are: Messrs. W. H. George, D. J. Sullivan, Alex. Mennie, J. D. McGilvray, Joseph B. Keenan, George T. Bowen, Charles W. Gompertz, C. G. Berg, R. J. H. Forbes, Thomas Campbell and J. Hart.

Long Beach Building Code.

A new classification of buildings will be made in the redrafting of the Long Beach city building code, now under way. Under the existing code four classifications are recognized, designated as Class A, fireproof; Class B, steel or reinforced concrete interior frame with wood floors; Class C, masonry walls and wood interior; Class D, wooden buildings. The new classifications will be as follows: Strictly fireproof, steel skeleton or reinforced concrete; semi-fireproof, masonry buildings with wooden interiors and wooden buildings. The new classification is that used in many eastern cities.

Partnership Dissolved.

The firm name of Edelman & Barnett, architects, has been changed to A. M. Edelman, architect, and the office has been moved to 726 H. W. Hellman building, Los Angeles. Mr. A. C. Zimmerman is associated with Mr. Edelman as architect and engineer.

Oakland Theater Steel Contract

Although San Francisco and the Bay cities are already well supplied with structural steel contractors, a Los Angeles concern has been awarded a contract for furnishing the frame of the new Fox theater and office building in Oakland. The figure at which this contract was let has not been made public.

It Pays to Advertise

A Western evangelist makes a practice of painting religious lines on rocks and fences along public highways. One ran: "What will you do when you die?"

Came an advertising man and painted under it:

"Use Delta Oil. Good for burns."—The American Legion Weekly.

H. T. James Retires.

Mr. H. T. James, one of the best known paint and oil manufacturers on the Pacific Coast, has retired from active participation in the management of the Bass-Hueter Paint Company, now owned by the National Lead Company, after 29 years of active service. Mr. James is succeeded as vice president, by Mr. J. B. Keister and as general manager by Mr. L. M. Ducommun. Mr. James retains a directorship in the company.

Class A Building.

Architect C. M. Hutchison, 427 Security Building, Los Angeles, has completed plans for a 6-story and basement class A store and office building at southeast corner of Sixth and Lebanon streets, for Mr. John L. Richardson.

Class A Theater.

Architect E. J. Borgmeyer, 1003 California Building, Los Angeles, has completed plans for a 2-story and basement ing at southwest corner of Pico street and Norton avenue, for Forum Theater Corporation.

Whittier Church.

Architect Robert H. Orr, 1301 Van Nuys Building, Los Angeles, has completed plans for a two-story and basement brick and plaster church building, at Whittier for the Whittier Christian Church.

Class A Building.

Architects Morgan, Walls & Morgan, 1124 Van Nuys Building, Los Angeles, have completed plans for two class A buildings, to be erected on Boyle Avenue, for Hollenbeck Home.

College Building.

Architect Robert H. Orr, 1301 Van Nuys Building, Los Angeles, is preparing working plans for the new zoological laboratory building, for Pomona College at Claremont. The building is being donated to the college by D. C. Crookshank of Pomona.

Designing Church

The building committee of the Swedish Methodist Church has commissioned Architect Anton Johnson, to prepare plans for the proposed $75,000 new church building. Rev. C. H. Sundstrom is pastor of the church.

$165,000 Garage

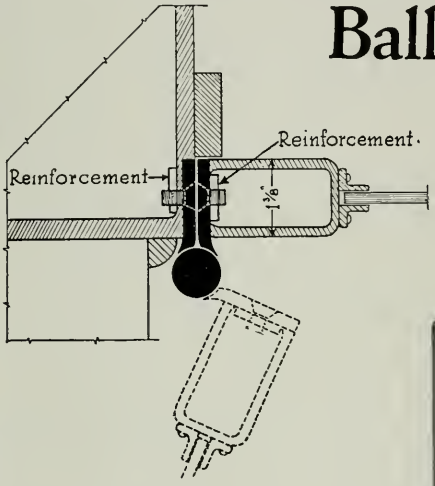
Architects O'Brien Bros. of San Francisco, are designing a five story reinforced concrete commercial garage to be built at Ellis and Mason streets, San Francisco, for the United Garage Company.

No. 4 of a Series of

STANLEY

SPECIFICATIONS ON

Ball Bearing Butts



No. 851
Scale: ½ size
6″ x 4″ butt on 1⅜″ iron and glass door with iron or steel jamb.

DATA:

Built for unusually heavy work, this butt is recommended for heavy iron doors. Made of cold rolled steel, without holes. Leaves can be cut off to suit special requirements. It is equipped with four Stanley non-detachable, weather protected ball bearing washers. Loose pin has the Stanley non-rising and self-lubricating features. Inner edges beveled. Corners are square. Edges of leaves are clean and even. Stanley Sherardized finish is recommended for exterior use. The class number (851) is stamped upon the back of leaf near joint.

Made in following sizes:

6″ x 4″	7″ x 6″
6″ x 5″	7″ x 7″
6″ x 6″	7″ x 8″
6″ x 7″	7″ x 10″
6″ x 8″	8″ x 6″
8″ x 8″	8″ x 10″

We showed specifications on BB239, BB252 and BB170 in previous issues of this publication. Will gladly forward them, if you wish to keep series complete.

The Stanley Works

NEW BRITAIN CONNECTICUT
NEW YORK CHICAGO SAN FRANCISCO
LOS ANGELES SEATTLE

Manufacturers of Wrought Hardware and Carpenters' Tools

STANLEY S.W.

The Contractor

BRASS TACKS*

By GODFREY EDWARDS
Pres Edwards, Wilder & Dixon Co.,
Los Angeles, California

BEFORE I begin, I have a brass tack for Mr. Channing and I didn't have the opportunity of handing it to him, although I was very much enlightened by his remarks. I noticed one thing he spoke of in the Automobile Show in New York. There were sixty-six models of automobiles and that was mentioned as an example of waste in industry. Gentlemen, to my notion those sixty-six models denote first of all, competition, and for God's sake (and I say it reverently) don't let's destroy anything in this day and age that denotes competition.

My tack is in this form, Mr. Channing. If we standardize automobiles to say, six standard patterns, why not standardize clothing for instance? There is only one institution that I know of that standardizes clothing and that is the penitentiary; there it is all the same. Why not go a little further and standardize jewelry? Now you fellows pretty nearly all have a ring; I've got two of them. Those rings mean something; perhaps your wife gave one to you, or your little girl; perhaps it is a Shrine ring or something. Why not standardize and have only six kinds of rings? I have noticed some of these wealthy contractors from the East have very elaborate rings. I noticed one, a black shield with a diamond in the corner. I have never seen that in California. Then suppose you take the clothing of us poor men. It is pretty well standardized compared to the ladies' clothing, but you know we men have one dissipation, that is our neckties. I came here with a real gay fellow, but Mrs. Edwards made me change it. How about three fabrics and six patterns? That is just a good natured tack and I am sure it reached Mr. Channing right end to. but I think that we can carry this standardization a little too far.

For instance, take it in a florist's business. Why not standardize flowers in the florist's business and have six flowers for summer and three for winter? That ought to satisfy your best girl or your wife when she is going to the theater or something of that sort. Isn't it a fact that certain fellows buying automobiles like to get something out of the ordinary and isn't it a fact that it stimulates that sort of men?

When you all come to Los Angeles next year you will find among other industries, you know, the movie industry. Now of course there are one or two stars that I am not going to mention, who get a lot of money, and you gentlemen contribute pretty largely to it. They like to have an automobile that you and I can't afford to buy. Why not let 'em gratify that little vanity? It is a good deal less inimical than some of the other pursuits they follow. Why not let them indulge that and why not let the manufacturer back in South Bend, Indiana, or wherever the Cadillac or Packard is made, indulge in making that special model? Suppose it is in a way a waste, the mechanic that makes it gets paid for it, and I presume he is a class of workman that gets paid a little more than the man who makes the Ford, for instance, which is very much standardized. But I think, gentlemen, we really can carry this elimination of waste a little too far.

We have all got to be doing something and if a man makes rings, why not let him indulge his fancy and make a real nice one that will catch your eye as you go by the shop? Maybe you wouldn't buy one of those six rings.

When I was a boy a good many years ago, the Polk Manufacturing Company of Connecticut brought out a bicycle with an elliptical sprocket. The bicycle magazines were then filled with articles, more or less scientific, proving that the elliptical sprocket was a great advance in bicycle production, because of more power at the critical moment when the foot came down and a quicker recovery to exert that power. All the bicycles that I know anything about today, however, are made with round sprockets.

About eighteen years ago in California, there was devised a method of economical road paving which consisted of plowing up the old roadway, pulverizing, watering, putting on oil, harrowing the oil in and then rolling it with a tamping roller. Immediately the road magazines of the country were covered with articles trying to demonstrate that we had a wonderful new method of economic road making. Today there is not a road engineer of any description that would even listen to such a method of building a road.

WHAT ARE FADS OF CONSTRUCTION?

That elliptical sprocket and the petro-

*Remarks before Building Division, Annual Meeting, A. G. C., Cleveland, Ohio, January 18, 1922.

lithic pavement were fads and fancies. What about the fads and fancies of our own construction industry? For the last four or five years we contractors have been fed up with cost plus a percentage contract, later modified to cost plus a fixed fee, and still more latterly modified to guaranteed cost plus a fixed fee, or a fee with a sliding scale—a profit or loss sharing, according to whether the estimate exceeded or was less than the original estimate.

We hear a good deal also about quantity survey furnished by the owner. That has merit if one can get a guaranteed form of survey by a licensed bureau which would be supervised in some such way so that there would be no opportunity for malpractice, and so that the contractors would know they were all treated alike.

It is my prediction that within five years the cost-plus-whatever-you-fancy, and the quantity estimate furnished by the owner will be thrown into the discard together with the elliptical sprocket and the petrolithic pavement. They are at the present day fads and fancies of construction.

WHAT IS A GENERAL CONTRACTOR?

My personal definition of a general contractor is a man or a firm that will deliver a finished structure in a certain definite time for a certain definite sum. Is a construction engineer running a job for an owner on a fixed salary, an engineer or a contractor? Is an architect running a job on segregated bids for a 10 per cent fee or more an architect, an engineer or a contractor? Is a concern with a force of construction engineers and an office force and a lot of machinery and equipment attempting to do big operating work all over this country, an engineer or a profiteer, a general contractor or a general nuisance?

OUR GREATEST DANGER

Are the big men of our industry who are trying to popularize the cost-plus system doing our business good or doing it harm? Why is it—and this is the experience on the Coast—that concerns doing that business are almost invariably left at the post when they enter the competitive lump sum competition?

What is the greatest danger facing our business today? Is it not the expensive fad of conducting public work by force account? That is a very grave danger today on the Coast.

What is the chief contributory cause of that condition? Is it not the propaganda of the cost-plus contractor? Assume a typical county in any State or a typical city council or a typical harbor board. In Los Angeles we have a harbor board which will spend about five million dollars in Los Angeles this summer. Begin with that typical county, that has in the past, we'll assume, been doing our work under competitive bids. Assume one of these construction engineers who have been working a couple of years or so for a cost-plus concern and who on account of the slackness of the times or perhaps some little unpopularity of that method in his particular location, is out of work. Imagine that he gets a position in that typical county as assistant county engineer in charge of construction. Imagine the host of machinery salesmen and equipment men crowding that fellow's office to sell him the latest equipment. Can't you almost hear the arguments that are made as to the saving to be effected by that unfortunate county by letting that engineer do that work at the actual cost of labor and material plus the insignificant pro rata of the salary of that construction engineer? Doesn't that make a pretty good academic argument?

Imagine the zeal of that fellow. He has been trained in this thing and he is perfectly conscientious about it, and he thinks he is just as good a contractor as you are. Imagine his zeal in exemplifying that to that county. Can't you see that practically every argument that the cost-plus firm can employ with an owner for private work is applicable in equal degree to a board of county commissioners? We must remember when a county or any other body builds up an army of constructors it is a pretty good thing to have around election time. There are additional arguments to let that county engineer run that public work. You can not foster the one, and by that I mean the contractor doing cost-plus work, without fostering the other. You can't destroy the one without destroying the other.

Should I add that the cost-plus contractor is pulling down with one hand the very structure that he is helping the rest of us build with the other hand? I maintain that the cost-plus contractor is doing that very thing — unintentionally but nevertheless very certainly — destroying the structure of general contracting with one hand and helping the rest of us attempt to build it up with the other.

A—WHAT IS A FAIR PROFIT?

I've got just four exhibits that are going to make the cost-plus fellows wiggle a little bit in their chairs. I will start out with Exhibit "A." First of all we hear this argument in favor of cost-plus: that while it may not show such a big profit as the lump sum it is a certain profit and a fair profit. In the city of San Francisco the cost-plus-a-fixed-fee has been very popular. The building for a prominent railroad line was built there by one

of the best contractors in San Francisco on a flat fee of practically 2 per cent. I maintain if that firm gave that building the attention that they should give it, if they sat up nights with it and gave it the best that was in them, 2 per cent did not adequately represent a fair profit on a contract of that magnitude, although I believe other buildings have been done since on about the same percentage. This is a little tack about getting a fair profit, but eliminating the gamble, you know.

B—ELIMINATING TROUBLES

Now Exhibit "B." A certain utility company in Los Angeles decided to build an office building of ten stories and one contractor, who was becoming very much infatuated with the cost-plus system, went to the owners and to the architect and persuaded them that the only logical way to build that thing was on a fee. He mentioned this argument which I have heard before: That it eliminated all possibilities of quarrels between the architect and the contractor—the contractor trying to skin every little thing and the architect trying to get the advantage of the contractor on every little thing. He made quite an impression on that architect and on that owner so that they sent out requests for bids on the amount of fee that we would build it for. That is the only time I came very near being a cost-plus contractor. I reluctantly confess I put in a bid. My bid was 6 per cent. I found out afterwards there were bids as low as 3½ per cent. But the trouble was that the other bidder had educated that architect a little too well. The architect was impressed with that argument about no trouble with the contractor; but he went a step further. He thought by eliminating the contractor altogether he was sure of eliminating all the trouble, so he hired one of the junior engineers of one of the principal contractors in Los Angeles and the architect built the building himself. The engineer that ran it got $300 a month.

C—SOME SIMPLE ARITHMETIC

In one case, a contractor had secured a nice contract, about $200 000. The work was turned over to a young man who had been working three or four years for one of the large eastern firms which did war work on a cost-plus basis. He built a good building, and the owner was thoroughly satisfied. In order to further cement the friendly relations which secured the job, the contractor furnished the owner all his receipted bills from all the sub-contractors, from all the material men, his pay rolls, etc. This was very nice, but six months after the building was completed the owners decided to duplicate that unit and they went to the same contractor. Did they give him the job? They did not. They went to his office and they hired that young man who built the other building for $400 a month and he built it.

Those owners were educated to the name of every satisfactory sub-contractor, to the name of every good material house, and to the prices to be paid. What a very simple process of elimination to say, "We paid you 7½ per cent, on $200,000 and now this young man will build us that unit for $400 a month."

Very simple arithmetic.

D—THE CONTAGION SPREADS

One advantage of the cost-plus contract very recently brought to my attention is that it enables the owner to proceed with the excavation, the foundation and the first floor while the architect is working up the remainder of the building, and thus saves rentals. This is a fine argument—presented not only to me—but to every large property owner who is thinking of building in Los Angeles.

And it gets all over the state, because your state engineer is in touch with the big interests there the same as they are in Cleveland, I suppose. So the State of California, about two years ago, was importuned by the authorities on insanity in California to very largely extend our hospitals for the mildly insane. A good many boys suffered from shell shock, and, of course, our population has been growing rapidly and we have to increase facilities in all lines. So the State Hospital at Norwalk, near Los Angeles, was inadequate to take care of these additional victims of shell shock and mild cases of insanity.

Of course, our boys were on the job and we got in touch with the state engineer and again the usual methods to hurry up the building, get it started, were pursued. There was very, very serious need of it.

The state engineer told us that he had decided, in order to save time, that they would do it by force account, because they could be putting in the foundation and putting on the first floor joists while the state engineer's architectural bureau, which, by the way, has 40 employes in it, were perfecting the rest of the building.

These are my four exhibits, and they are all very largely the results of the propaganda of the cost-plus men.

PUBLICITY AS A DEFENSE

Of course, gentlemen, we have our weapons for combatting such things. The greatest weapon, of course, is publicity—facts; in other words, brass tacks—facts as to the difference between engineers' estimates, and by that I mean the difference between the public official's estimate of the cost of an operation and the final result; facts as to ability and wide experience, sometimes dearly bought

by some of us in the purchasing department; facts as to overhead; facts as to the depreciation of the state machinery and equipment; facts such as comparison of costs on similar jobs that have been built under competitive condition. That is what we all use to explode the delusion of doing public work by force account.

QUANTITY SURVEY

Touching very lightly, because I know it's going to be brought up again, the question of quantity survey furnished by the owner, I am going to ask you again, what is a general contractor? Have we any functions besides putting on an apron with nails in one side and a hammer on the other? We feel this way: If a contractor wants a job, it's up to him to figure it, it's up to him to go after it right and he can't go after a job right unless he takes off his own quantities in such a way that he can back them up with his pocketbook.

PROFITS NECESSARY TO CONSTRUCTION

I want to say just a word in deference to the program as to retarded construction. Before we can go into the remedies for delayed construction, we've got to look earnestly and very frankly into the causes. Personally, I look on all these various special aids to promote private construction as purely ephemeral, and, while I think they are well-intentioned, I think they are more harmful than beneficial in the long run.

Construction will go ahead logically and will go ahead full swing when the man who puts his money into it feels that it is safe and profitable to put it in and not until then. Why doesn't he feel safe now? Why doesn't he feel that it is profitable now? Well, the man who wants to build a home, or the man who wants to build a building for income, thinks that construction costs today are too high. Of course, we have heard that argument before. He very strongly suspects that the reason they are too high is because the subsidiary associations controlling the material that goes into those buildings are too well organized.

Our function for this year is to look into that. If that suspicion is well-founded, we must get after it. If that suspicion is not well founded, it is our business to dissipate it and disabuse the minds of the investing public of that fact.

COY COMPETITION, DEADEN INDUSTRY

I believe in competition. Whatever little success I have had, I have achieved in competition. I don't believe you can destroy competition. I don't believe you can hamper it without stultifying the industry you are in. I believe that trying to control competition has brought about very largely the conditions we are here discussing this afternoon.

To illustrate that: A friend of mine recently said that the best offer a rancher could get about a month ago from the packing houses on sheep was $3.50 a head. I am telling this to you just because the packing industry is so very well organized, based on the argument that by organization they can cheapen the product. You know there is nothing left of a pig, not even the squeal, after they work up the by-products. Thus, they should be able to slaughter cattle and sheep much cheaper than the little country abattoir. The same day my friend was complaining about the low quotation for his sheep. I had to buy some mutton chops at 50 cents a pound. That is a good example of organization, and you don't need a chart of statistics to illustrate it, either. The next day the Los Angeles Times came out with the statement that the retail butchers, however, complained that 40 per cent less meat per capita was consumed by the people of Los Angeles than before the war.

COMPETITION OR SOCIALISM?

In Los Angeles in the last two years there have been literally thousands of temporary houses built. The real name of them is garages. We really call them shacks and people say it is real cute to live in a garage in the back of the lot. I'm going to come back to that in a minute.

If we are going to do away with competition and put co-operation in its place (and you all know, of course, what co-operation by the average material association is), we are going to get one of these results: Either the people who are not in these associations are going to learn to do without or do with less. That is exactly what they are doing today in your city and mine—they are eating less meat per capita, dringing less milk per capita; they are wearing poorer clothes and many are living in temporary houses. That is one result.

The other is that bye and bye the people will get tired of making these continual sacrifices and will rise up and break up all these associations; else they will take control of the industries themselves. That means Socialism pure and simple. It is what we are drifting into very rapidly unless we put competition in its old place as a controlling element.

ORGANIZATION IN CONSTRUCTION*

By COL. EVAN SHELBY
(Formerly Legal Adviser to the Construction Division U. S. Army.)

BEFORE the world war, I had a rather hazy idea of the business of Contractors.It had seemed to me to consist principally of inducing public officials with very little previous information, to give some individual of small financial responsibility and perhaps very little construction experience a large job at a very high figure which would permit of enough profit to divide with the politicians and still leave a fairly large return to the fortunate "best" bidder.

My views have changed since then. I know now what an important part the construction industry plays in the life of our Country. Next to farming it is the basic industry of the Nation. It is the foundation stone of manufacture, transportation and nearly all urban life.

When we entered the Great War our lack of preparedness was nowhere more acute than in the matter of construction. There was no such thing as an Organized Construction Industry. Some of the allied professions such as engineering and architecture were organized, but the Contractors, the people who really do the construction work of the country were practically without organization, in fact they were the most highly competitive class of all of our commercial life. The need for the entire output of all of our construction forces was immediately brought home to the Government. The Army and the Navy, the agencies through which the industrial life of the Nation was to be changed from peaceful to warlike purposes, found at the very outset that the old methods by which Contractors were competing in huge gambling operations where risk of complete failure was usually the price of getting a job, would not produce the Government requirements and allow us to become the turning factor in the War. They could not risk failure on their important jobs even if the Contractors were willing to take the risk of being entirely wiped out.

The work had to be done, and the thing which confronted those responsible for the work was the necessity of utilizing to the best advantage the ability, the experience and the resources in equipment, money and men of the Contractors of our Country. This necessity created the Construction Division of the Army—which can be described as a large holding company into which were gathered together most of the construction resources of the Nation. I do not mean just the managerial force of the Construction Division—the men in uniform and their associates who might be called the Central Office force—but the thousands of construction units—the Contractors and the Sub-Contractors who were gathered together and called upon to perform in the field the biggest construction program ever seen at any time in any country.

What an everlasting pity it is that the needs of an acrimonious political campaign should have brought into the public press and upon the platform false and distorted reports of that great and patriotic achievement.

Organization permitted us to do that war-time work. Without some such central organization agency the Nation could not have accomplished the huge tasks it did in the construction field. We secured efficiency by organization. Efficiency is as desirable in peace time as it is in war-time. It means the elimination of duplication, the elimination of waste and the making the expenditure of every ounce of energy and of every cent's worth of material produce its full measure of return The progress and wealth of the Nation are largely, if not entirely, due to efficiency in the basic industries.

This is the day of organization. Everything tends in that direction. There was a time when every large organization was under suspicion because of its power for evil. Today most countries, both by laws and executive action are encouraging such combinations because of their power for good. All people are directing their attention to the good that may be accomplished by organization. The Construction Industry has been the last important one to undertake to organize in a really effective manner.

Competition is necessary, but competition which expends useful energy with no commensurate good must be eliminated. In the construction industry there is too much competition in matters where such competition only amounts to duplication and waste for which the public must pay. There is ample room for the play of competition in the factors of service—in skill, economies of production, integrity, and dependability.

In the matter of contracts alone will

*Address delivered at the National Convention of the Associated General Contractors, Cleveland, Ohio, January 19, 1922.

be found ample reason for the existence of this Association. If you can persuade the industry as a whole to adopt a form of contract which would be standard, you will have done immeasurable good to the Country. A basic uniform contract, which shall gradually receive judicial interpretation which will be recognized in all Courts in all States, will eliminate untold waste in the countless litigations which grow out of mere variety in form of construction contracts.

Progress in legislation dealing with the Construction industry requires combined effort to accomplish. Joint effort not only irons out the differences in the industry itself, but produces the desired effect upon those whom we call to legislate for us. Construction Contractors are responsible for the expenditure of such enormous sums of money—nearly four billion dollars a year—that they should be organized in a way to deal most beneficially and effectively with the collective groups from whom they must buy the labor and the materials for their work.

Public opinion is one of the largest assets in any industry. To direct and properly influence public opinion is particularly the function of organized endeavor in such industry. It is not half as important that Contractors as such should make large profits for themselves as it is that the great construction industry should be right—that is that it should be conducted on the highest principles of fair dealing and efficiency, and that the world should be made to know that Construction Contractors are not just gamblers on how much a piece of construction work will cost, but are producers—are industrial workers who are rendering to the public the highest class of skilled professional and managerial service.

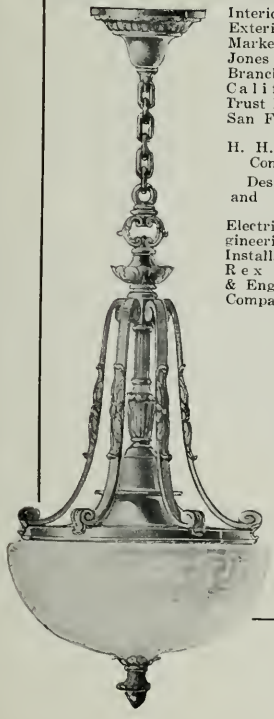
The A. G. C. has undertaken a work which I venture to prophesy will have as fine a result in the commercial life of our land as any Association of the best in any line of endeavor has ever set as its goal.

Stockton Architect Busy

New work in the office of Architect Glenn Allen, Stockton, includes a two-story brick apartment house for Mr. Louis Jacobs estimated to cost $40,000; a $40,000 brick residence for Mrs. George Dorman and a two-story reinforced concrete arcade, 100x200 for a corporation headed by Mr. L. A. Mills. The arcade building will cost $200,000.

Fraternity Building

Architect W. R. Yelland of Oakland, is preparing plans for a $25,000 two-story frame fraternity building for the Theta Chi Fraternity.



Interior and Exterior of Market and Jones Streets Branch Anglo-California Trust Building, San Francisco.

H. H. Winner Company
Designers and Builders

Electrical Engineering and Installation by Rex Electric & Engineering Company.

Tests of Road-Building Materials

An experiment to determine just how hard rock or gravel must be in order to be satisfactory for use in building concrete roads, is being carried on by the Bureau of Public Roads at the Arlington Experimental Farms of the United States Department of Agriculture. About 60 sections of experimental road are being constructed, in which practically every variety of stone, gravel and sand will be used. These sections will then be traveled over thousands of times by a machine automatically operated and which has the same effect on the pavement as a motor truck. This will continue until the wearing properties of all the sections are determined. The bureau believes that the results of these tests will show that many local materials heretofore deemed unsuitable may be used safely in building concrete roads, thereby saving the cost of importing stone, gravel, or sand from a distance.

Architects for Safety in Building

The Oregon State Board of Architect Examiners in conjunction with the office of the State Fire Marshal has made an appeal to the architects of the state to cooperate with them in enforcing the provisions of the state laws and orders of state officials relating to the regulation of building construction, which provide for greater safety to life and property from fire and accident. The State Board of Architect Examiners requests that all plans for buildings to be used wholly or in part as places of public assembly of any character, including schools, dormitories, hotels and apartment houses, be submitted to the State Board of Architect Examiners or to the office of the State Fire Marshal for suggestions as to public safety.

Standardizing Paving Brick

Elimination of 59 varieties of paving brick, reducing the styles and sizes from 66 to 7, is an illustration of what may be done in the way of standardization when a real effort is made. Through the division of simplified commercial practice of the Department of Commerce, which is helping manufacturers to eliminate waste in their business, the number of varieties of paving brick was reduced last fall from 66 to 11. A further reduction to 7 varieties has just been made. The last four types eliminated comprised 10 per cent of the total shipments of paving brick in 1921.

Removal Notice

Arthur Priddle, Public Quantity Surveyor and Estimator, has removed his offices to Room 606, Williams Building, San Francisco.

Automobiles Increased 1,000,000

With returns received from all states, the U. S. Bureau of Public Roads reports that the motor vehicle registration for the year 1921 totalled 10,448,632. This represents an increase of more than a million over the 1920 figures, or a number equal to the total number at the beginning of 1913. The greatest increases in registration were in industrial sections, the agricultural sections in general showing a smaller amount of increase. No state reported a registration less than the 1920 figures. The total amount collected as fees of various kinds amounted to $122,478,654. It has been expected that the registrations this year would show a greater falling off in the rate of increase than the figures reported show. The increase this year continues approximately the same average rate that has been maintained for the last seven years and shows no indication of the near approach of a condition of saturation in the supply of motor vehicles.

New Plant for Crittall Casement Window Company.

To take care of greatly increased production the Crittall Casement Window company has begun the erection of a new plant, at Hearn and Springnela streets, Detroit, Mich.

The plant is being built by Mr. A. A. Albrecht, contractor and will be ready for occupancy May 1. The plans are Crittall Casement Window Company's own.

This building is designed to be the central and larger of a group of three, the other two to be built later. The main building is 300 feet long by 100 in width, and will contain the general offices as well as the steel casement factory.

Will Design High School

Architects Roland F. Sauter and E. Keith Lockard of Santa Barbara, will be associated with architect W. H. Weeks of San Francisco. in designing the new Santa Barbara High school for which bonds amounting to $450,000 were noted March 31st.

Weeks & Day Move

Messrs. Weeks and Day announce the removal of their offices from the Phelan building to California Commercial Union building, 351 Montgomery street, San Francisco, where they will continue the practice of architecture and engineering.

Wallboard Plant

Mr. William B. Thurman, president of the California Cedar Products Company, announces that his firm has just established a new wallboard plant south of Stockton. The new enterprise entails a capital of $50,000.

Present Cost of Building Materials*

With Labor Wage Scale, Bonds, Etc.

THESE quotations are based on reliable information furnished by the San Francisco material houses. Date of quotations, April 20, 1922.

All prices f. o. b. cars San Francisco or Oakland. For country work add freight and cartage to prices given.

American Institute of Architects' Fees

New work—Usual rate, 6 per cent minimum charge recommended by the Institute.
Alterations—7 to 10 per cent as a minimum.
High class residence work—10 per cent as a minimum. Editor's Note—These rates not mandatory.

Bond—1½% amount of contract.

Brickwork—
- Common, $36.00 per 1000 laid.
- Face, $100.00 per 1000 laid.
- Common, f. o. b. cars, $15.50, plus cartage.
- Face, f. o. b. cars, $50.00 per 1000, carload lots.

HOLLOW TILE FIREPROOFING (Delivered to building in carload lots.)

12x12x3 in.	$112.00 per M
12x12x4 in.	128.50 per M
12x12x6 in.	184.50 per M
12x12x8 in.	288.50 per M

- Hod carriers, $6.00 per day.
- Bricklayers, $9.00 per day.
- Lime—$2.25 per bbl.; carload, $2.15 per bbl.

Composition Floors—30c per sq. ft.

Concrete Work (material at San Francisco bunkers)—

No. 3 rock	$2.50 per yd.
No. 4 rock	2.25 per yd.
Niles pea gravel	3.25 per yd.
Niles gravel	2.50 per yd.
Niles top gravel	3.00 per yd.
City gravel	2.00 per yd.
River sand	1.50 per yd.
Delivered bank sand	1.00 per yd.

SAND
- Del Monte.. $1.25 to $1.50 per ton
- Fan Shell Beach.. 2.50 to 3.00 per ton
- Car lots, f. o. b. Lake Majella.
- Cement (f. o. b. cars) $3.03 per bbl.
- Rebate for sacks, 10c each.
- Atlas "White" $12.50 per bbl.
- Medusa cement $12.50 per bbl.
- Forms $25.00 per M
- Wage—
- Concrete workers $5.00 per day
- Cement finishers 8.00 per day
- Laborers 6.00 per day

Dampproofing—
- Two-coat work, 25c per yard.
- Membrane waterproofing—4 layers of P. B. saturated felt, $5.25 per square.
- Hot coating work, $2.00 per square.
- Wage—Roofers, $7.50 per day.

Electric Wiring—$7.00 to $11.00 per outlet for conduit work (including switches).
Knob and tube average $3.25 to $6.00 per outlet.
Wage—Electricians, $8.00 per day.

Elevators—
Prices vary according to capacity, speed and type. Consult elevator companies. Average cost of installing an automatic elevator in 4-story bldg., $4,000; direct automatic, about $3,500.

Excavation—
- $1.50 per yard, if sand.
- Teams, $10.00 per day.
- Trucks, $21 to $30 per day.
- Above figures are an average without water. Steam shovel work in large quantities, less; hard material, such as rock, will run considerably more.

Fire Escapes—
Ten-foot balcony, with stairs, $100.00 per balcony.

Glass—(Consult with manufacturers.)
- 21 ounce, 20c per square foot.
- Plate, $1.20 per square foot.
- Art, $1.00 up per square foot.
- Wire (for skylights), 41c per square foot.
- Obscure glass, 28c per square foot.
- Note—Add extra for setting.
- Wage—Glaziers, $7.50 per day.

Heating—
- Average, $2.00 per sq. ft. of radiation, according to conditions.
- Wage—Steamfitters, $9.00 per day.

Iron—Cost of ornamental iron, cast iron, etc., depends on designs.
- Wage—Iron workers, bridge and structural, $9.00 per day.
- Architectural iron workers, $7.00 per day.

Lumber—(Prices delivered to bldg. site)
- Common, $32 per M (average).
- Com'n O.P. (select, avrg.,..$43.00 per M
- Flooring—

1x6 No. 3—Form lumber	$21.00 per M
1x4 No. 1 flooring	75.00 per M
1x4 No. 2 flooring	67.00 per M
1x4 No. 3 flooring	45.00 per M
1x6 No. 2 and better flooring	68.00 per M
1¼x4 and 6 No. 2 flooring	70.00 per M

Slash grain—

1x4 No. 2 flooring	$48.00 per M
1x4 No. 3 flooring	39.00 per M

No. 1 common run to

T. & G.	$35.00 per 1000
Lath	9.00 per 1000

Shingles—(Add cartage to prices quoted)

Redwood, No. 1	$1.00 per bdle.
Redwood, No. 2	.90 per bdle.
Red Cedar	1.00 per bdle.

Hardwood Floors—
- Maple floor (laid and finished), 25c per foot.
- Factory grade floors (laid and finished) 20c per foot.
- Oak (quartered, finished) 40c per foot
- ⅝ Oak (clear) 29c per foot (plain).
- ⅝ Oak (select), 27c per foot (plain).
- ⅝ Oak, quartered, sawed, clear, 35c.
- Wage—Floor layers, $9.35 per day.

Hardwood Floors (not laid)—

		per M ft.
5/16x2" sq. edge	Clear quartered oak	$173.50
	Select quartered oak	121.50
	Clear plain oak	119.00
	Select plain oak	95.00
13/16x2¼" face	Clear quartered oak	210.00
	Select quartered oak	144.00
	Clear plain oak	157.50
	Select plain oak	114.00
	Clear maple	134.50
	Clear maple—white	178.00
13/16x3¼" face	Clear maple	134.50
1⅛xx2¼"	face Clear maple	134 50
⅝x2"	face Clear quartered oak	158.00

*Skilled labor not plentiful, and difficult to get out of town. Above prices will increase accordingly.

Millwork—
O. P., $100 and up per 1000. R. W., $120 and up per 1000.
Double hung box window frames, average) with trim, $7.50 and up, each.
Doors, including trim (single panel), $10 and up, each.
Doors, including trim (five panel), $9.00 each.
Screen doors, $3.50 each.
Cases for kitchen pantries seven feet high, per lineal foot, $9 each.
Dining room cases, if not too elaborate, $10.00 each.
Labor—Rough carpentry, warehouse heavy framing, $13.00 per 1000.
For smaller work, average, $25.00 to $35.00 per 1000.
Wage—Carpenters, $8.00 per day.
Laborers—Common, $6.00 per day.

Marble—(Not set), add 60c up per ft. for setting.

Columbia	$1.90 sq. ft.
Alaska	1.90 sq. ft.
San Saba	3.25 sq. ft.
Tennessee	2.40 sq. ft.
Verde Antique	4.10 sq. ft.

Wages—Marble setters, $8.00 per day; helpers, $5.50 per day. Marble polishers and finishers, $6.00 per day.

Painting—

Two-coat work	35c per yard
Three-coat work	50c per yard
Whitewashing	5c per yard
Cold water painting	9c per yard

Turpentine, $1.08 per gal. in cases and 93c per gal. in tanks.
Raw Linseed oil.....95c per gal. in bbls.
Boiled Linseed oil....97c per gal. in bbls.
Pioneer white and red lead, 11¾c lb. in one ton purchases; 12½c lb. for less than 500 lbs.
Wage—Painters, $8.00 per day.
Note — Accessibility and conditions cause wide variance of costs.

Patent Chimneys—

6-inch	$1.50 lineal foot
8-inch	1.75 lineal foot
10-inch	2.25 lineal foot
12-inch	3.00 lineal foot

Pipe Casings—14″ (average), $7.50 each.

Plastering—
Interior, on wood lath, 65c per yard.
Interior, on metal lath, $1.30 per yard.
Exterior, on brick or concrete, $1.30 per yard.
Portland White, $1.75.
Interior on brick or terra cotta, 60c to 70c per yard.
Exterior, on metal lath, $1.85 to $2.25 per yard.
Wood lath, $7.00 at yard per 1000.
Metal studding, $1.25 to $1.50 per yard.
Suspended ceiling and walls (metal furring, lathing and plastering), $2.00 per yard.
Galv. metal lath, 33c and up per yard, according to gauge and weight.
Lime, f. o. b. warehouse, $2.15 per bbl.
Lime in less than carload lots, $2.25 per bbl.
Hardwall plaster. $22.00 per ton, f. o. b. warehouse. (Rebate on sacks, 15c.)
Hydrate of lime, $19.50 per ton, f. o. b. warehouse.
Wage—Plasterers, $10 per day.
Lathers, $8.00 per day.
Hod carriers, $7.00 per day.

Plumbing—
From $70.00 per fixture up, according to grade, quantity and runs.
Wage—Plumbers, $9.00 per day.

Reinforcing Steel—
Base price for car load lots, $2.70 per 100 lbs., f. o. b. cars on docks.
Average cost to install, $24 per ton.
Wage—Housesmiths, $7.85 per day.

Roofing—
Five ply tar and gravel, $6.25 per square for 30 squares or over.
Less than 30 squares, $6.75 per square.
Tile, $35.00 to $50.00 per square.
Redwood Shingle, $10.00 per square in place.
Cedar Shingle, $10.00 per sq. in. place.
Reinf'd Pabco, 7 yr. roof, $7.50 per sq.
Reinf'd Pabco, 10 yr. roof, $8.25 per sq.
Reinf'd Pabco, 20 yr. roof, $14 per sq.
Recoat, with Gravel, $3.00 per square.
Wage—Roofers, $7.50 per day.

Rough Hardware—
Nails, per keg, $4.25 base.
Deafening felt, $75.00 per ton.
Building paper, P. & B.:
1 ply, $3.25 per 1000 ft. roll.
2 ply, $5.00 per 1000 ft. roll.
3 ply, $7.50 per 1000 ft. roll.
Sash cord:
Sampson spot, $1.75 per hank 100 ft.
Common, $1.00 per hank 100 ft.
Sash weights, cast iron, $80.00 per ton.

Sheet Metal—
Windows—Metal, $2.00 a square foot.
Fire doors, (average), including hardware, $2.30 per sq. ft.

Skylights—
Copper,$1.25 a square foot (not glazed)
Galvanized iron, 35c a square foot (not glazed).
Wage—Sheet metal workers, $8.50 per day.

Stone—
Granite, average $10.00 sq. ft. in place.
Sandstone, average $7.00 sq.ft. in place.
Wage—Stone cutters, $8.00 per day.
Stone setters, $8.50 per day.

Store Fronts—
Zouri copper bars for store fronts, corner, center and around sides, will average $1.25 per lin. ft.
Zouri Underwriters' Specification sash, $1.60 per lin. foot.

Structural Steel—$105 per ton (erected
This quotation is an average for comparatively small quantities.
Light truss work higher; plain beam and column work in large quantities, less.
Cost of steel for average building (erected) $100 per ton.

Steel Sash—
All makes. from S. F. stock, 26c to 34c per sq. ft.
All makes. plant shipment, 28c to 34c per sq. ft.
(Includes mullions and hardware.)

Tile—White glazed, 80c per foot.
White floor, 80c per foot.
Colored floor tile, $1.00 per foot.
Promenade tile, $1.00 per sq. ft. laid.
Wage—Tilesetters, $8.00 per day.

The ARCHITECT & ENGINEER

MAY 1922

Published in San Francisco
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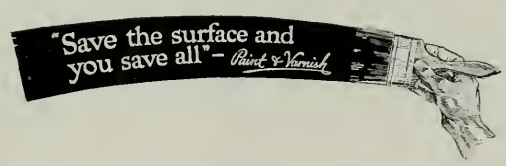

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R. A. Messmer & Bro., Milwaukee, Architects

VONNEGUT HARDWARE CO.
Indianapolis, Ind.

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ASBESTOS MATERIALS
Johns-Manville Inc., of California, 500 Post street, San Francisco.

ART METAL
Federal Ornamental Iron and Bronze Co., 16th St., and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
California Artistic Metal & Wire Co., 349 Seventh street, San Francisco.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Tropico Potteries, Inc., Glendale, Cal.

AUTOMATIC SPRINKLERS
Grinnell Co., of the Pacific, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Company, 72 Natoma street, San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

AUTOMOBILES
W. L. Hughson Co., Geary St., at Van Ness Ave., San Francisco.

BANK FIXTURES AND INTERIORS
Fink & Schindler, 218 13th St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.

BELTING AND PACKING
New York Belting and Packing Company, 519 Mission St., San Francisco.
H. N. Cook Belting Co., 401 Howard St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

BLACKBOARDS
C. F. Weber & Co., 985 Market St., San Francisco, Los Angeles and Reno, Nevada.
Beaver Blackboards and Greenboards — Coast Agents, Rucker-Fuller Desk Company, 677 Mission St., San Francisco; also Oakland and Los Angeles.
Steuart Sales Co., 247 Rialto Building, San Francisco.

BLINDS—VENETIAN AND DIFFUSELITE
J. G. Wilson Corporation, Metropolitan Bldg., Los Angeles; Waterhouse-Wilcox, Underwood Bldg., San Francisco.
Western Blind & Screen Co., Long Beach Ave., Los Angeles; C. F. Weber & Co., San Francisco, Los Angeles and Phoenix, Ariz.

BOILERS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
Kewanee Boiler Company, Factory Branch, Exposition Building, San Francisco.
Kewanee Water Supply System, Simonds Machinery Co., 117 New Montgomery St., San Francisco.

BONDS FOR CONTRACTORS
American Mutual Liability Insurance Co., Balboa Bldg., San Francisco.
Bonding Company of America, Kohl Bldg., San Francisco.
Bankers & Shippers Insurance Co. of New York, Insurance Exchange Bldg., San Francisco.
Globe Indemnity Co., 444 California St., San Francisco.
Fidelity & Casualty Co. of New York, Balfour Bldg., San Francisco.
National Surety Co. of New York, 105 Montgomery St., San Francisco.
William Healey & Son, 208 Crocker Building, San Francisco.

BRASS GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 635 Mission St., San Francisco.

BRICK, PRESSED, COMMON, ETC.
Richmond Pressed Brick Co., Sharon Bldg., San Francisco. Plant at Richmond, Cal.
United Materials Co., Sharon Bldg., San Francisco.
Cannon & Co., Sacramento; and 77 O'Farrell St., San Francisco.

BRICK & CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
The Paraffine Companies, Inc., 34 First St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn., Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Palace Hardware Company, Agents Corbin goods, 581 Market St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora; Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.

BUILDING MATERIALS, SUPPLIES, ETC.
Abeel-Jensen Co., Call Bldg., San Francisco.
Pacific Materials Co., Underwood Bldg., San Francisco.
Waterhouse-Wilcox Co., 523 Market St., San Francisco.

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CABINET MAKERS
Home Manufacturing Company, 543 Brannan St., San Francisco.
Fink & Schindler Co., 218-13th St., San Francisco.
Mullen Manufacturing Company, 64 Rausch St., San Francisco.
Lannom Bros. Mfg. Co., 5th and Magnolia Sts., Oakland.
Pacific Mfg. Co., San Francisco, Los Angeles and Oakland.

CARPETS
John Breuner Co., 281 Geary St., San Francisco.
D. N. & E. Walter, Mission near Second St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Francisco.
Edward J. Margett, 61 Ellis St., San Francisco.

CASEMENT WINDOW HARDWARE
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

CASTINGS
Victory Manufacturing Co., Monadnock Bldg., San Francisco.

CEMENT
Atlas Portland Cement Co., agencies in all principal Coast cities.
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.
Medusa White Portland Cement, manufactured by Sandusky Cement Co., represented in San Francisco by Pacific Materials Co., Underwood Bldg., San Francisco.
Old Mission Portland Cement Co., Mills Bldg., San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Armorite, soly by W. P. Fuller & Co., all principal Coast cities.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CLAY PRODUCTS
Cannon & Co., Sacramento, Cal.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Tropico Potteries, Inc., Glendale, Cal.
United Materials Co., Sharon Bldg., San Francisco.
S. & S. Tile Company, San Jose, Calif.

CLOCKS—ELECTRIC TIME
Pacific Electric Clock Co., 714 Wells-Fargo Bldg. San Francisco.
Standard Electric Time Co., 461 Market St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.
Cyclops Iron Works, 837 Folsom St., San Francisco.

COMPOSITION FLOORS
"Linotol" plastic flooring, Hill, Hubbell & Co., 115 Davis St., San Francisco; 410 San Fernando Bldg., Los Angeles.

CONCRETE OR CEMENT HARDENER
Gunn, Carle & Co., Inc., 444 Market St., San Francisco.

CONCRETE MIXERS
Foote and Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

CONCRETE REINFORCEMENT
Edw. L. Soule Co., Rialto Bldg., San Francisco.
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
Judson Mfg. Co., 817-821 Folsom St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Triangle Mesh Fabric. Sales agents, Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., 527 Tenth St., San Francisco.
Badt-Falk Co., Call-Post Bldg., San Francisco.

CONDUITS
Garnett Young & Co., 612 Howard St., San Francisco.

CONTRACTORS, GENERAL
Barrett & Hilp, 918 Harrison St., San Francisco.
Larsen-Siegrist Co., Inc., 807 Claus Spreckels Bldg., San Francisco.
R. W. Littlefield, 357-12th St., Oakland.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
Unit Construction Co., Phelan Bldg., San Francisco.
J. D. Hannah, 142 Sansome St., San Francisco.
Ruegg Bros., California Commercial Union Bldg., San Francisco

ARCHITECTS' SPECIFICATION INDEX—Continued

John M. Bartlett, 357 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.
Herbert Beckwith, Everson Bldg., Oakland.
Collman & Speidel, 546 Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Monson Bros., 251 Kearny St., San Francisco.
Fontanella & Teza, 1682 Eddy St., San Francisco.
Geo. Wagner, 251 Kearny St., San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.
McLeran & Co., R., Hearst Bldg., San Francisco.
Robert Trost, 26th and Howard Sts., San Francisco.
I. M. Sommer, 401 Balboa Bldg., San Francisco.
Jas. L. McLaughlin, 251 Kearny St., San Francisco.
Alfred H. Vogt, 185 Stevenson St., San Francisco.
Lange and Bergstrom, Sharon Bldg., San Francisco and Washington Bldg., Los Angeles.

CONTRACTORS' EQUIPMENT
Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Hearst Bldg., San Francisco.
Smith, Booth-Usher Co., 60 Fremont St., San Francisco; 228 Central Ave., Los Angeles.

CONVEYING MACHINERY
Messe & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CONVENIENCE OUTLETS
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard St.

CORK TILE
David E. Kennedy, Inc., 305 Crocker Bldg., San Francisco.
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

CRUSHED ROCK
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

CURTAINS—STEEL, ROLLING, FIREPROOF
J. G. Wilson Corp., 621 N. Broadway, Los Angeles.

DAMP-PROOFING AND WATERPROOFING
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Samuel Cabot Co., Boston; represented in San Francisco by Pacific Materials Co., Underwood Bldg., San Francisco.
"Pabco" Damp-Proofing Compound, sold by the Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

DOOR HANGERS
McCabe Door Hanger Company, leading hardware stores.
Pitcher Hanger, sold by National Mill & Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Waterhouse-Wilcox Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Oregon.
Stanley Works, New Britain, Conn... Monadnock Bldg., San Francisco.
Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Drinking Faucet Co., 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 166-7th St., San Francisco.
San Francisco Elevator Company, Inc., 860 Folsom St., San Francisco.

ELECTRICAL CONTRACTORS
Butte Electrical Equipment Company, 530 Folsom St., San Francisco.
Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.
Brown-Langlais Electrical Construction Co., 313 5th St., San Francisco.
Central Electric Company, 185 Stevenson St., San Francisco.
NePage, McKenny Co., 589 Howard St., San Francisco.
Newbery Electrical Co., 359 Sutter St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Globe Electric Works, 1959 Mission St., San Francisco.
M. E. Ryan, Redwood City, and 520 Clunie Bldg., San Francisco.
H. S. Tittle, 766 Folsom St., San Francisco.
Spott Electrical Co., Sixteenth and Clay Sts., Oakland.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.

ELECTRICAL SUPPLIES AND EQUIPMENT
Garnett Young & Co., 612 Howard St., San Francisco.
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard St.

ARCHITECTS' SPECIFICATION INDEX—Continued

Safety Electric Company, 56-65 Columbia Square, San Francisco.
Drendell Electrical & Mfg. Co., 1345 Howard St., San Francisco.
Western Electric Safety Mfg. Co., Inc., 247 Minna St., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 166-7th St., San Francisco.
San Francisco Elevator Co., 860 Folsom St., San Francisco.

ENGINEERS—CONSULTING, ELECTRICAL, MECHANICAL
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.
Ralph E. Dodge, 251 Kearny St., San Francisco.

ELEVATOR DOOR HARDWARE
Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

FAIENCE TILE
Tropico Potteries, Inc., Glendale, Cal.

FELT—ASPHALT, DEADENING
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FENCES—WIRE AND IRON
Standard Fence Construction Co., 245 Market St., San Francisco, and 316-12th St., Oakland; 320 Los Angeles St., Los Angeles.

FILLING STATION EQUIPMENT
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco, 830 S. Los Angeles St., Los Angeles.

FIRE EXIT LATCHES
Vonnegut Hardware Co., Indianapolis, Ind.

FIRE ESCAPES
Michel & Pfeffer Iron Works, 1415 Harrison St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE-PROOF DOORS
Forderer Cornice Works, 269 Potrero Ave., San Francisco.
U. S. Metal Products Co., 330-10th St., San Francisco.
Fire Protection Products Co., 3117-20th St., San Francisco.
Kinnear Mfg. Co., represented in San Francisco by Pacific Materials Co., Underwood Bldg.

FIRE SPRINKLERS—AUTOMATIC
Grinnell Company of the Pacific, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Co., 72 Natoma St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

FIRE RETARDING PAINT
The Paraffine Companies, Inc., 34 First St., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
The Fink & Schindler Co., 218-13th St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

FLOORS—TILE, CORK, ETC.
Mangrum & Otter, 827 Mission St., San Francisco.
S. & S. Tile Company, San Jose.
Van Fleet-Freear Co., 61 New Montgomery St., San Francisco, and 420 S. Spring St., Los Angeles.
David E. Kennedy, Inc., 305 Crocker Bldg., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLOORS—HARDWOOD
Oak Flooring Manufacturers' Association of the United States, Ashland Block, Chicago, Ill.
Cadwallader, Gibson Co., 234 Steuart St., San Francisco.
Parrott & Co., 320 California St., San Francisco.
Strable Hardwood Company, 511 First St., Oakland.
E. L. Bruce Co., Manufacturers, Memphis, Tenn.

FLOORS—MASTIC—FLOOR COVERING
Hill, Hubbell & Company, 115 Davis St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

ARCHITECTS' SPECIFICATION INDEX—Continued

FUEL OIL SYSTEMS
S. T. Johnson Co., 1337 Mission St., San Francisco.
S. F. Bowser & Co. Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco.

FURNACES—WARM AIR
Mangrum & Otter, 827 Mission St., San Francisco.
Montague Range and Furnace Co., 826 Mission St., San Francisco.
Pacific Heating Company, Second and Grove Sts., Oakland.

FURNITURE—BUILT-IN
Hoosier Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—SCHOOL, CHURCH, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
F. W. Wentworth & Co., 539 Market St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

GARAGE HARDWARE
The Stanley Works, New Britain, Conn., Coast sale offices, San Francisco, Los Angeles and Seattle, Wash.
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

GAS STEAM RADIATORS—FUMELESS, ETC.
Ra-Do Fumeless Gas Radiators, manufactured and sold by Baird-Bailache Co., 478 Sutter St., San Francisco.

GLASS
American Window Glass Co., represented by L. H. Butcher Co., 862 Mission St., San Francisco.
Cobbledick-Kibbe Glass Co., 175 Jessie St., San Francisco.
Fuller & Goepp, 32 Page St., San Francisco, and Syndicate Bldg., Oakland.
W. P. Fuller & Company, all principal Coast cities.

GRADING, WRECKING, ETC.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco.

GRANITE
California Granite Co., Builders' Exchange, San Francisco.
Raymond Granite Co., Potrero Ave., and Division St., San Francisco.

GRAVEL AND SAND
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.
Del Monte White Sand, sold by Del Monte Properties Co., Crocker Bldg., San Francisco.

GYMNASIUM EQUIPMENT
Ellery Arms Co., 583 Market St., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.
The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
Corbin hardware, sold by Palace Hardware Co., 581 Market St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora, Ill., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.
Vonnegut hardware, sold by Abeel-Jensen Co. Call Bldg., San Francisco.

HARDWDOD LUMBER—FINISH, ETC.
Parrott & Co., 320 California St., San Francisco.
Strable Hardwood Company, First St., near Broadway, Oakland.
E. L. Bruce Company, American oak flooring, Memphis, Tenn.

HEATERS—AUTOMATIC, GAS, ELECTRIC
Electric Sales Service Co., manufacturers of Therm-elect Water Heater, West Berkeley.
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.
Pure Air Gas Heating Co., 401 Battery St., San Francisco.
Ra-Do Fumeless Gas Heater, sold by Baird-Bailhache Company, 478 Sutter St., San Francisco.
Wm. J. Schwerin, Agent Hulbert Electric Steam Radiator, Rialto Bldg., San Francisco.

HEATING AND VENTILATING CONTRACTORS' EQUIPMENT, ETC.
Atlas Heating and Ventilating Company, Inc., Fourth and Freelon Sts., San Francisco.
Alex Coleman, 706 Ellis St., San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Hateley & Hateley, Mitau Bldg., Sacramento.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Lawson & Drucker, 450 Hayes St., San Francisco.
James A. Nelson, 517 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Mechanical Engineering & Supply Co. 908-7th St., Sacramento.

ARCHITECTS' SPECIFICATION INDEX—Continued

Scott Company, 243 Minna St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
Griffin Sheet Metal Works, Fresno.
W. H. Picard and F. J. Edwards, 5656 College Ave., Oakland.
Tiltz Engineering & Equipment Co., 479 Monadnock Bldg., San Francisco.

HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O'Farrell St., San Francisco.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 553 Mission St., San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

ICE MAKING MACHINERY
Cyclops Iron Works, 837 Folsom St., San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant Sts., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSULATION—CORK
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

INSURANCE BROKERS
William Healey & Son, Crocker Bldg., San Francisco.

INTERIOR DECORATORS
Martin & Frederick, 1374 Sutter St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero St., San Francisco.

JAIL EQUIPMENT
Ralston Iron Works, 20th and Indiana Sts., San Francisco.

KITCHEN CABINETS
Hoosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.

LANDSCAPE ARCHITECT
Emerson Knight, 704 Market St., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING AND PLASTERING
MacGruer & Simpson, 226 Tehama St., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.

LATHING MATERIAL
Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., Tenth St., near Bryant, San Francisco.

LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.
Pacific Gas & Electric Co., Sutter St., San Francisco.

LIGHTING FIXTURES
Thomas Day Company, Mission, near Third St., San Francisco, and Oakland.
Roberts Mfg. Co., 663 Mission St., San Francisco.
Electric Appliance Co., 807 Mission St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.
David E. Kennedy, Inc., Crocker Bldg., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
Pacific Manufacturing Company, San Francisco, Oakland, Los Angeles and Santa Clara.
Pope & Talbot, foot of Third St., San Francisco.
Santa Fe Lumber Co., 16 California St., San Francisco.
Sunset Lumber Company, First and Oak Sts., Oakland.

MAGNESITE FLOORING, STUCCO, ETC.
Dorite Mfg. Co., 116 Utah St., San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

MANTELS—WOOD, TILE, ETC.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Fink & Schindler, 218-12th St., San Francisco.

MANUAL TRAINING EQUIPMENT
Richards-Wilcox Mfg. Co., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Ray Cook Marble Company, foot of Powell St., Oakland.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
Tompkins-Kiel Marble Company, 505 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117-20th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Cornice Works, 269 Potrero Ave., San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218-13th St., San Francisco.
Lannom Bros. Mfg. Co., 5th and Magnolia Sts., Oakland.

NOTARY PUBLIC
William Healey & Son, 208 Crocker Bldg., San Francisco.

OIL BURNERS
Bunting Iron Works, 1215 First Nat. Bank Bldg., San Francisco.
Fess System Co., 220 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
T. P. Jarvis Manufacturing Co., 275 Connecticut St., San Francisco.
G. E. Witt Co., 862 Howard St., San Francisco.
W. S. Ray Manufacturing Co., 29 Spear St., San Francisco.
F. L. Warner, 696-20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 16th St., and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

PANIC DOORS
Vonnegut hardware, sold by Abeel-Jensen Co. Call Bldg., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.
Hill, Hubbell & Company, 115 Davis St., San Francisco.

PAINTING—SPRAY EQUIPMENT
Pneumatic Painting Machinery Co., 1046 Monadnock Bldg., San Francisco.

PAINTING, TINTING, ETC.
Atherly Bros., 2032 Polk St., San Francisco.
Wayne & Williams, 1621 Eddy St., San Francisco.
I. R. Kissel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
The Tormey Co., 681 Geary St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
A. Quandt & Son, 374 Guerrero St., San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 414-424 Ninth St., San Francisco.
Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco and all principal Coast cities.
R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
W. P. Fuller & Co., all principal Coast cities.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PARTITIONS—FOLDING AND ROLLING
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Farncisco.

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS
Victory Manufacturing Co., Monadnock Bldg., San Francisco.

PLASTER
"Arden" brand, A. C. Robertson, Builders' Exchange, San Francisco. U. S. Gypsum Co.

PLASTERING CONTRACTORS
A. Knowles, Call Bldg., San Francisco.
MacGruer & Simpson, 266 Tehama St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Doell, Carl T., 467 21st St., Oakland.
Hateley & Hateley, Mitau Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College Ave., Oakland.

PLUMBING FIXTURES, MATERIALS, ETC.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 553 Mission St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
Standard Metals Mfg. Co., 1300 N. Main St., Los Angeles; 216 Hobart Bldg., San Francisco.
Victory Mfg. Co., 423 Monadnock Bldg., San Francisco.
West Coast Porcelain Manufacturers, Oceanic Bldg., San Francisco.

POLES AND PILING
Santa Fe Lumber Co., 16 California St., San Francisco.

POWER TRANSMITTING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PRELIMINARY ESTIMATES, VALUATIONS
Arthur Priddle, Williams Bldg., Third and Mission Sts., San Francisco.

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—HAND OR POWER, FOR OIL AND GASOLINE
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS
Arthur Priddle, Williams Bldg., Third and Mission Sts., San Francisco.

RADIATORS—ELECTRIC STEAM
William J. Schwerin, 217 Rialto Bldg., San Francisco.

REINFORCING STEEL
Edward L. Soule, Rialto Bldg., San Francisco.
Badt-Falk & Co., Call Bldg., San Francisco.
Judson Iron Works, San Francisco and Oakland.
Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Pacific Coast Steel Co., Rialto Bldg., San Francisco.
Truscon Steel Co., 527-10th St., San Francisco.

RERIGERATORS
McCray Refrigerator Company San Francisco office, 765 Mission St.

ROCK AND GRAVEL
Coast Rock & Gravel Co., Call Bldg., San Francisco.

ROOFING AND ROOFING MATERIALS
"Malthoid" and 'Ruberoid," also 'Pabco" ten and twenty year roofs, manufactured by the Paraffine Companies, Inc., San Francisco.
United Materials Co., Sharon Bldg., San Francisco.
H. H. Robertson Co., Hobart Bldg., San Francisco.
Jones Brothers Asbestos Supply Co., 512 Second St., San Francisco.
Johns-Manville Inc., of California, 500 Post St., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

RUGS & CARPETS
Edw. J. Margett, 61 Ellis St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAND
Coast Rock & Gravel Co., Call Bldg., San Francisco.
Dele Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, San Francisco and Los Angeles.

SAFES AND VAULTS
Hermann Safe Company, 216 Fremont St., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles, and 17th and Mission Sts., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The Paraffine Companies, Inc., 34 First St., San Francisco.

SHEET METAL WORK
Forderer Cornice Works, 269 Potrero Ave., San Francisco.
Griffin Sheet Metal Works, Fresno, Cal.
Pacific Heating Company, Second and Grove Sts., Oakland.
U. S. Metal Products Co., 330-10th St., San Francisco.
Fire Protection Products Co., 3117-20th St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

SHINGLE STAINS
Bass-Hueter Paint Company, all principal Coast cities.
Cabot's Creosote Stains, sold by Pacific Bldg. Materials Co., 525 Market St., San Francisco.
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—COMPOSITION, UNIT AND STRIP
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

SHUTTERS—ROLLING, FIRE, STEEL, WOOD
J. G. Wilson Corp, 621 North Broadway, Los Angeles.

SINKS—COMPOSITION
Petrium Sanitary Sink Co., Fifth and Page Sts., Berkeley.

STEEL HEATING BOILERS
Kewanee Boiler, factory branch, Exposition Building, San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 55 Eighth St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Western Pipe and Steel Co., 444 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Judson Mfg. Co., 817-821 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Ralston Iron Works, 20th and Indiana streets, San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco and Key Route Fell, Oakland.
Western Iron Works, 141 Beale St., San Francisco.

STEEL ROLLING DOORS
Kinnear Rolling Steel Doors, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco.
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles. Waterhouse-Wilcox Co., San Francisco.
Rolph, Mills & Co., San Francisco, Los Angeles, Portland and Seattle.

STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 525 Market St., San Francisco.
"Lupton" steel sash, Waterhouse-Wilcox Co., agts., San Francisco, Los Angeles and San Diego.
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich. Direct factory sales office, Foxcroft Bldg., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS
Zouri Safety Sash Bars—Cobbledick-Kibbe Glass Company, 175 Jessie St., San Francisco.

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SUMP AND BILGE PUMPS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco.

SWITCHES AND SWITCHBOARDS
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer's Safety Switch Co., 575 Howard Street, San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market street, San Francisco.
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannon & Co., Sacramento; and 77 O'Farrell St. San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.
United Materials Co., Sharon Bldg., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

TILE—STONE—CEMENT
National Stone Tile Company, Inc., Merchants National Bank Building, San Francisco.

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los Angeles, Portland and Seattle.

TRAVELING CRANES
Cyclops Iron Works, 837 Folsom St., San Francisco.

VALVES—PIPES AND FITTINGS
Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
H. Mueller Mfg. Co., 635 Mission street, San Francisco.
Kennedy Valve Mfg. Co., 23-25 Minna street, San Francisco.
Victory Manufacturing Co., Monadnock building, San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.
Everlasting Blow-off Valves. General Machinery and Supply Co., 39 Stevenson street, San Francisco.

VARNISHES
Bass-Hueter Paint Company, Mission, near 4th street, San Francisco, and all principal Coast cities.
W. P. Fuller Co., all principal Coast cities.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, 55 Stevenson St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
C. F. Weber & Co., 985 Market St., San Francisco.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, Rialto Building, San Francisco.

WALL BEDS, SEATS, ETC.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.
California Wall Bed Company, Inc, 714 Market St., San Francisco.

WALL BOARD
"Amiwud" and "Pahco," manufactured by The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.

WALL PAPER AND DRAPERIES
The Tormey Co., 681 Geary St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Francisco.
Uhl Bros., San Francisco.

WARDROBES—HYGENIC, SCHOOL
J. G. Wilson Corp, 621 North Broadway, Los Angeles.

WATERPROOFING (see Damp-proofing)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

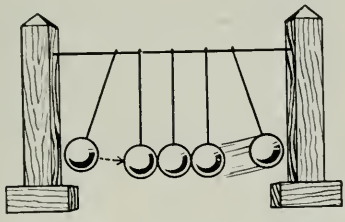
WHITE ENAMEL
"Gold Seal," manufactured and sold by Bass-Hueter Paint Co. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.
The Paraffine Companies, Inc., 34 First St., San Francisco, Los Angeles, Portland and Seattle.

WINDOW SASH CHAIN
The Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, 507 Mission street, San Francisco, and I. W. Hellman Bldg., Los Angeles.

WINDOW SHADES
W. & J. Sloane, 216 Sutter street, San Francisco.
D. N. & E. Walter, 562 Mission street, San Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Waterhouse & Wilcox, San Francisco, representatives.
Hauser Window Co., 157 Minna St., San Francisco.
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Francisco.

WIRE FENCE
Standard Fence Co., 245 Market street, San Francisco; and 310 12th street, Oakland. .....



"To every action there is an equal and contrary reaction."

Newton's Laws of Motion.

EVERY SCHOOL BOY knows the above law, quotes it glibly, demonstrates it knowingly. Its applications are many and varied.

Sunday Morning Thoughts

ONE of our men who lives down the Peninsula was inspecting his home this last Sunday. It was a new bungalow, stucco, well-designed and pleasing to the eye. When he bought it a year ago the paint was scarcely dry. It looked good.

MUCH to his disgust and chagrin he found the paint peeling, blistering, checking. He knew the answer,—camouflaged paint. "To every action there is an equal and contrary reaction." Moral: The negligent parties in this transaction have lost the owner's good will and further business.

Our Message to Architects

YOU are commissioned to plan, supervise and construct a public edifice, a modern office building, a hotel, theatre, or home. Your specifications call for Fuller's paints or equal. When the building is constructed and the opening day is a matter of history, when two or three years have passed, what is going to be the owner's opinion of you and the painting contractor? Is it going to be valuable because dependable paints were used? Is the owner going to be pleased with the building because his redecorating costs are negligible? We repeat, "To every action there is an equal and contrary reaction." Avoid these contrary reactions by specifying Fuller's.

A FEW FULLER DEPENDABLE PRODUCTS

FULLER'S PIONEER WHITE LEAD — FULLER'S CONCRETA
FULLER'S PURE COLORS IN OIL — FULLERWEAR VARNISH
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FULLER'S FIFTEEN FOR FLOORS VARNISH
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SACRAMENTO	SAN DIEGO		SEATTLE	WALLA WALLA
FRESNO	SANTA MONICA		TACOMA	SALT LAKE CITY
STOCKTON	HOLLYWOOD		SPOKANE	LOS ANGELES
LONG BEACH	YAKIMA		BOISE	OAKLAND

"Little Orchard Farm," residence of Mr. Samuel Heller, White Plains, N Y. Mr. Frank J. Forster, New York, Architect.

A Pleasing Application of White Cement Stucco

THE above photographs of Mr. Samuel Heller's "Little Orchard Farm" at White Plains, N. Y., reveal a dignified simplicity of wall treatment, together with a correct proportioning of detail, which command unusual interest. The Architect specified stucco made with Medusa Stainless White Cement, applied over metal lath. The finish coat was rough cast, showing sweeping marks left by the trowel.

These pictures suggest the unique and interesting possibilities of stucco work done in Medusa White, a true Non-Staining White Portland Cement. In its original whiteness, or tinted to any desired shade, it offers unlimited opportunities to obtain distinctive effects in stucco textures.

Architects may specify Medusa White Cement, plain, or with Medusa Waterproofing added at the mill in just the right proportions to make the work permanently damp-proof.

Attractive booklets, just out, describing Medusa White Cement and Medusa Waterproofing, give explicit specifications for use, along with interesting illustrations. We shall be pleased to send them.

Medusa White Cement and Medusa Waterproofing are carried in stock and sold by leading building-supply dealers in California, Oregon and Washington.

THE SANDUSKY CEMENT COMPANY, Department P, Cleveland, Ohio

Manufacturers of Medusa Stainless White Cement (Plain and Waterproofed); Medusa Gray Portland Cement (Plain and Waterproofed); and Medusa Waterproofing (Powder or Paste).

MEDUSA

WHITE CEMENT

Waterproofed or Plain

The PETRIUM

SNOW WHITE

NON-POROUS

A Real Sanitary Sink

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AGENCIES

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Patterson—E. L. Fink
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Visalia—Visalia Plumbing Co.
Vallejo—Winchell Hdwe. Co.
Venice Hill—March Lumber Co.
Watsonville—P. J. Freiremuth
Walnut Creek—W. L. Mauzy

PETRIUM SANITARY SINK COMPANY

Factory and Office, West Berkeley, Cal.

THE ARCHITECT AND ENGINEER

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ENTRANCE, HOUSE OF MR. C. L. HIBBARD, SEATTLE, WASHINGTON JOSEPH S. COTE, ARCHITECT

THE
ARCHITECT
AND
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MAY
1922

Vol. LXIX
No. 2

BIENNIAL EXHIBIT OF THE WASHINGTON CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS

By CARL F. GOULD, President

ON Saturday night, April first, the biennial exhibit of the Washington State Chapter of the American Institute of Architects was formally opened with a reception in the rooms of the Seattle Fine Arts Society.

The gallery presented an appearance on entering which aroused a surprised interest among the several hundred invited guests. Announcing the entrance two large plaster fauns stood as sentinels. Within, the first wing of the gallery gave the impression of a Roman atrium, the center of which was marked with a rectangular bed of planted grass, brick bordered and box-hedged, a gold mosaic bird bath in the center. At the base of the walls about the room were banked plants and cypress trees marked each pilaster division.

Above and trailing down were festoons of the greens. Upon the walls of this portion of the gallery were placed exhibits of gardens and residences. Perspectives of work executed and that proposed, as well as many photographs of gardens and residences recently completed were here hung. It was interesting to note that well-rendered perspectives in color appeared better and commanded the attention of the public more than did the actual photographs, and seemed more in harmony with the scheme of the room.

A canopied drapery, green and yellow in color, covered the ceiling through which the reduced light percolated by day, and artificial light by night, giving a fresh, springlike atmosphere to the room.

Opening in the form of an ell from the entrance gallery through an arched trellis, were the exhibits of a more institutional character in the larger space. Against the wall terminating the entrance axis was an elevated fountain, the back portion in bas relief, in front of which two graceful figures leaned forward with the tips of the fingers dipping into the pool; this by Alice Carr.

Several well presented perspective drawings of commercial buildings were shown at the far end enframed among palms which tended to soften their academic appearance. The interesting work of important

school buildings erected through the state, and private school buildings and the University of Washington, indicated the importance attached by the public to education in this northwest section of the United States.

There were several very excellent churches shown. A hydraulic power plant showing the potential importance of hydro-electric energy was dramatically presented in a drawing by the former City Architect Mr. Daniel R. Huntington. A series of drawings by the students of the department of Architecture of the University of Washington gave evidence of their ability, several of which were mentioned projects judged by the Society of Beaux Arts Architects of New York City. Student work of high schools, showing the orders, etc., was also in evidence.

HOUSE OF MR. O. W. FISHER, JR., SEATTLE
J. Lister Holmes, Architect

It was quite apparent throughout the exhibits that there is a tendency toward larger window areas in both residences and institutional work. At the same time a vertical tendency is apparent, and possibly a reversion from classic characteristics to a type suggested by late English Gothic. Especially is this noticeable among educational buildings. Nevertheless some of the most interesting exhibits shown suggested Spanish characteristics, with large plastered wall areas and flat roofs, with interesting parapet walls. Such buildings as the new ones at the Olympia Capital by Messrs. Wilder & White, and the new Seattle National Bank by Messrs Doyle & Merriam were conspicuous by their absence.

Among the out-of-town members exhibiting were Messrs. Sutton & Whitney, A. J. Russell, R. E. Borheck, Heath & Cove and Bell of Tacoma.

Mr. J S. Cote, chairman of the exhibition committee, deserves much credit for the attractive manner in which the exhibit was presented.

He was ably assisted by Messrs. J. Lister Holmes, A. F. Curtiss and Marcus B. Priteca. Credit must be given to Mr. Charles Alden for presenting an informing exhibit of farmers' residences and small houses by the Northwest Division of the Small House Bureau.

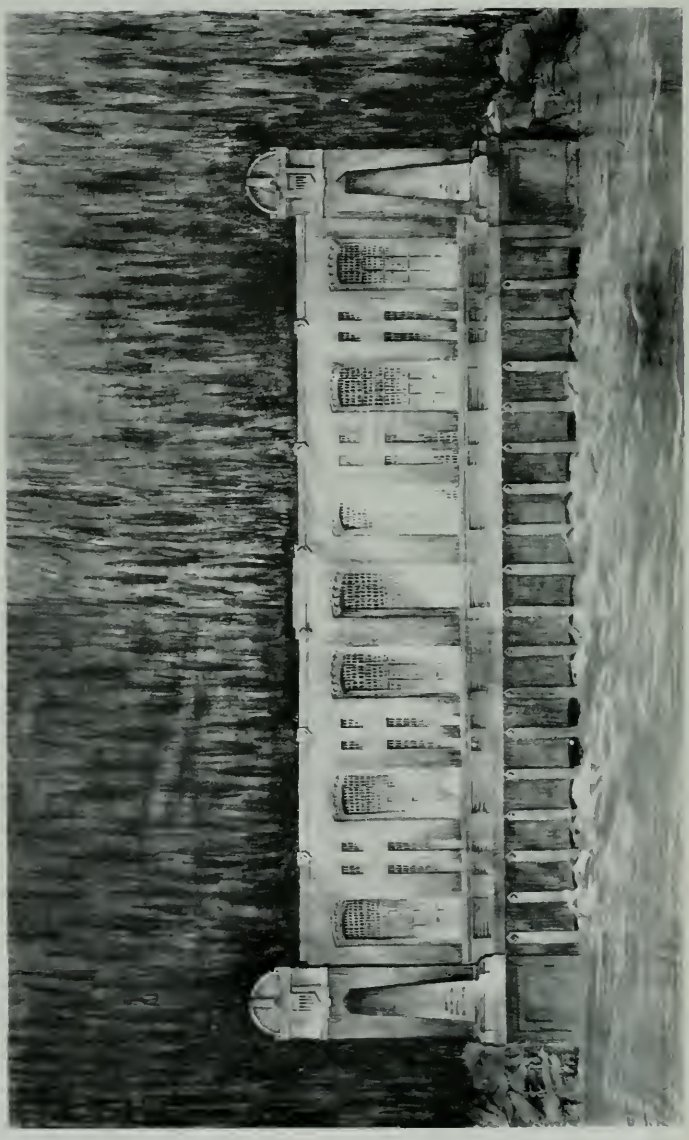
The Seattle architects exhibiting were Messrs. Shack, Myers and Young; Arthur L. Loveless; Louis Baeder; E. Frere Champney; Howard Riley; F. A. Naramore; H. C. Sexsmith; Carl Siebrand, J. S. Cote, W. E. Dyer, Charles Alden, E. J. Ivey, C. H. Bebb and C. F. Gould, R. F. McClelland, W. M. Wallis, Harlan Thomas, E. P. Storey, John Graham, W. R. B. Wilcox, D. R. Huntington, Sherwood Ford, M. B. Priteca, J. Lister Holmes, A. H. Albertson and G. C. Field, Joe W. Wilson and D. P. Richardson, H. A. Blogg, E. N. Dugan, Lawton & Moldenhour, Louis Macomber (del) and Sam Chamberlain.

LIVING ROOM, HOUSE OF MR. O. W. FISHER, JR., SEATTLE
J. Lister Holmes, Architect

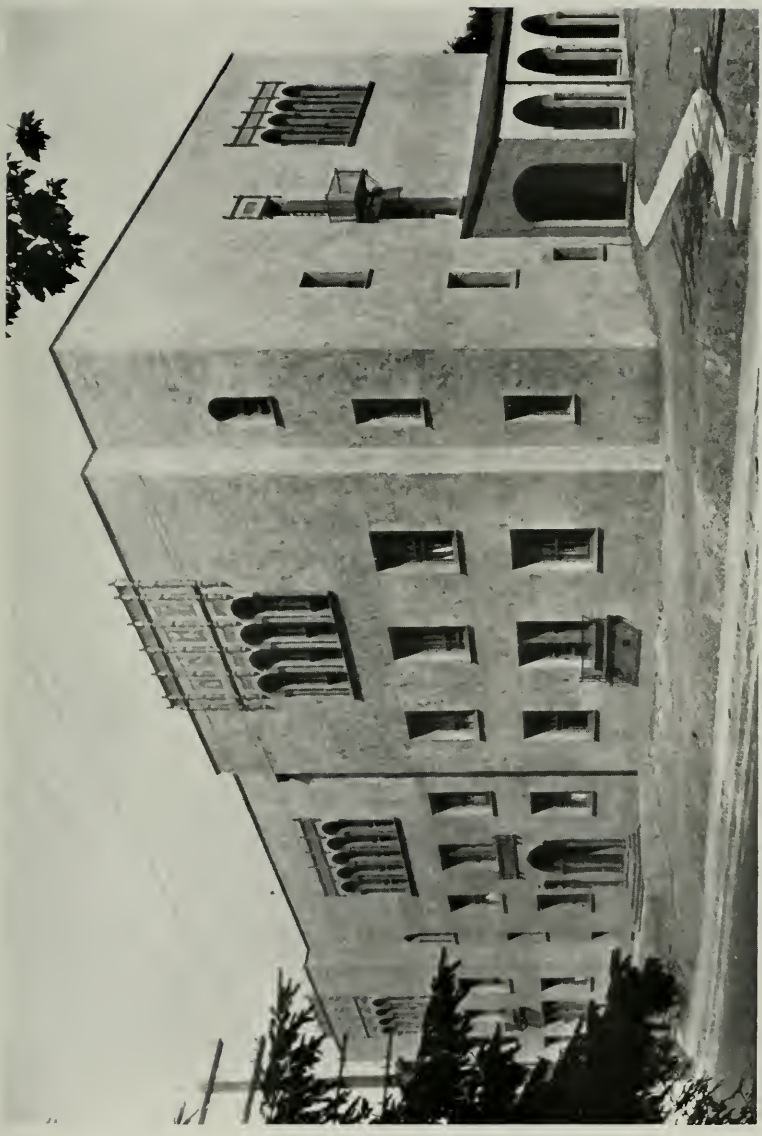
By presenting to the public their work, and offering it in a picturesque and attractive form, the architects hope thereby to create a wider interest in better building, both as to its construction and its beauty of appearance. The architect's contact with the public is difficult of attainment due to the fact that a client is a client in most cases but once. Neither is advertising in the ordinary sense a medium which he has employed to bring before the public the important service which he performs. We trust that the effort put into such an exhibition may be justified, not necessarily by any direct return in the form of work but by a more widespread public appreciation of the value of improvement in the physical condition of buildings as well as of the attractiveness of their appearance.

As Dr. Henry Suzzalo, president of the University of Washington, aptly said at the annual meeting of the Chapter:

"You architects are above all the guardians of beauty."



SKAGIT RIVER HYDRO-ELECTRIC POWER HOUSE FOR CITY OF SEATTLE, WASH. DANIEL R. HUNTINGTON, ARCHITECT



CORNISH SCHOOL, SEATTLE, WASH.
A. H. ALBERTSON ARCHITECT

CORNISH SCHOOL, SEATTLE, WASH.
A. H. ALBERTSON ARCHITECT

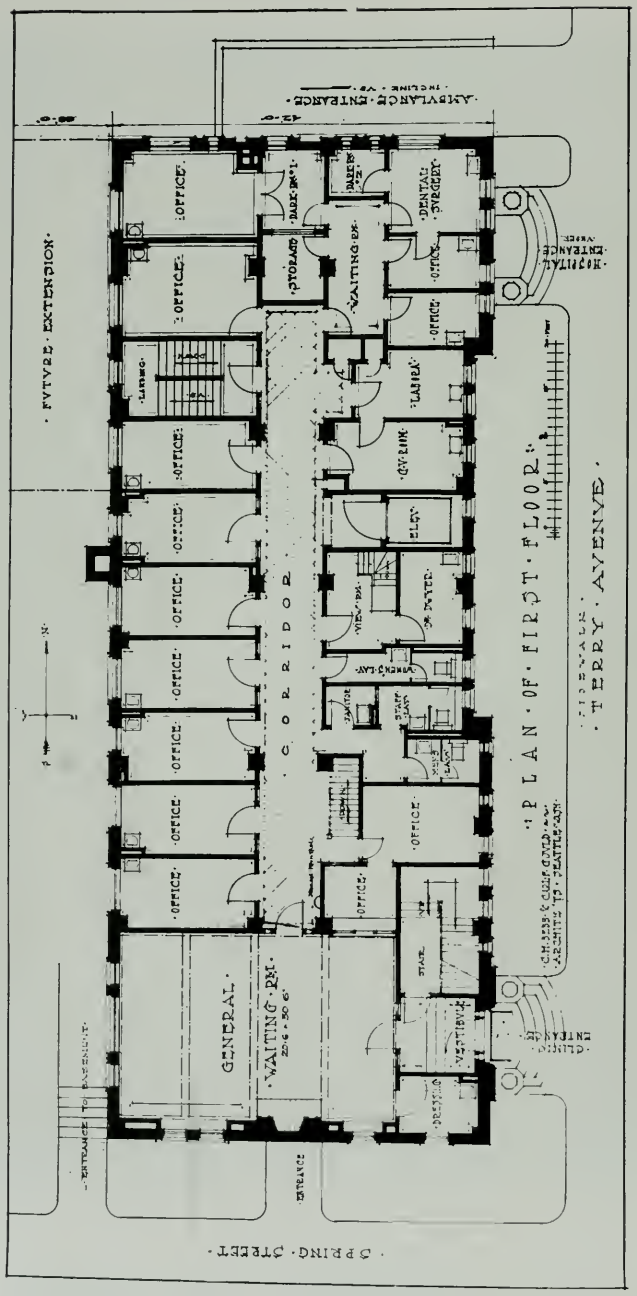
NATIONAL BANK OF COMMERCE, SEATTLE, WASH.
DOYLE & MERRIMAN ARCHITECTS

STAIRHALL, HOUSE OF MR. CARL F. GOULD, SEATTLE WASHINGTON
BEBB & GOULD, ARCHITECTS

DINING ROOM, HOUSE OF MR. CARL F. GOULD, SEATTLE, WASHINGTON
BEBB & GOULD, ARCHITECTS

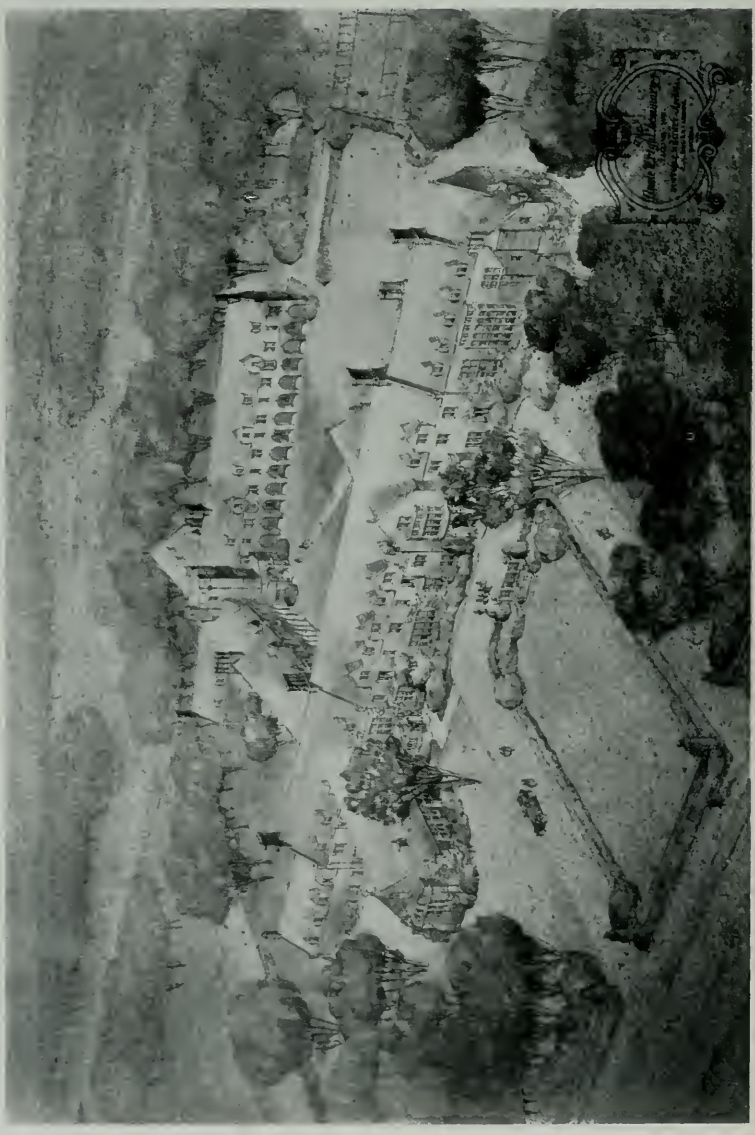
VIRGINIA MASON HOSPITAL, SEATTLE, WASH.
BEBB & GOULD ARCHITECTS

DOORWAY, VIRGINIA MASON HOSPITAL, SEATTLE
WASHINGTON BEBB & GOULD, ARCHITECTS

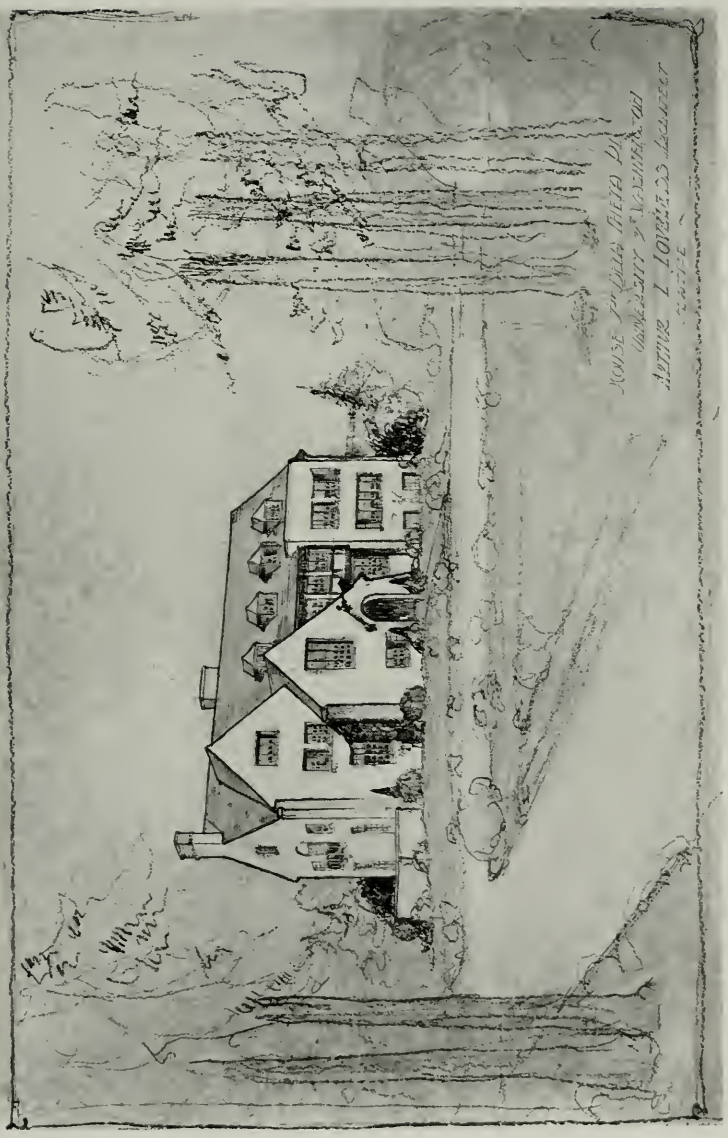


FIRST FLOOR PLAN VIRGINIA MASON HOSPITAL, SEATTLE, WASH. BEBB & GOULD, ARCHITECTS

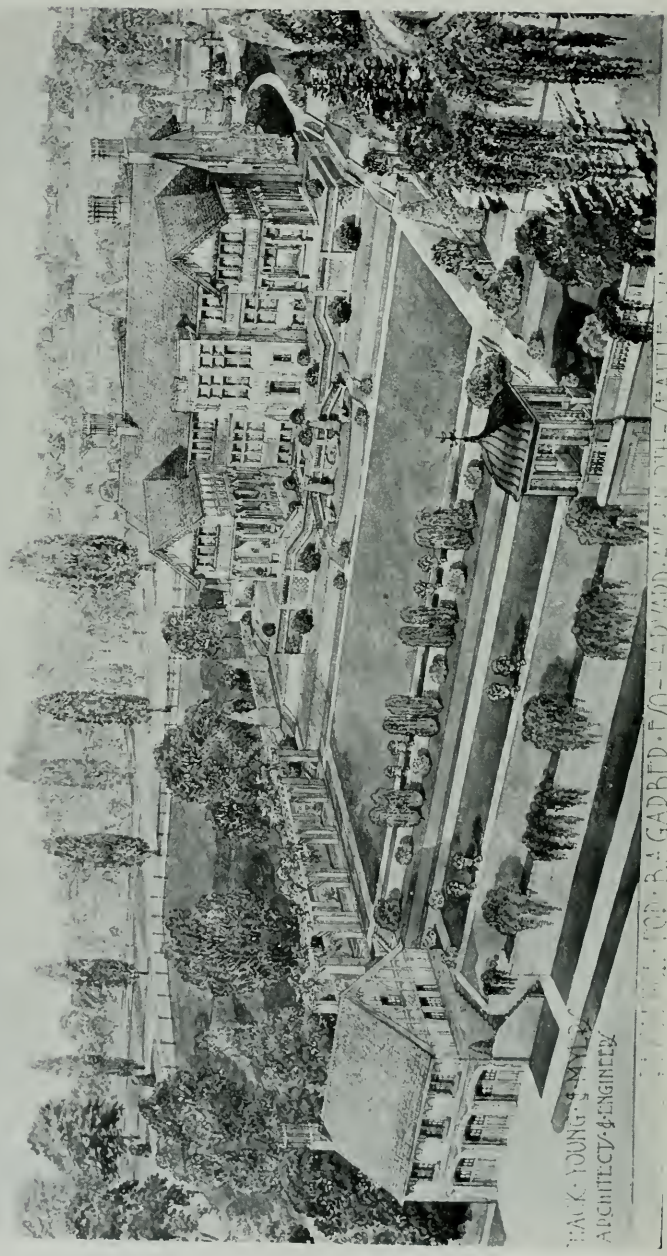
SOUTH PORCH PHILOSOPHY HALL, UNIVERSITY OF WASHINGTON, SEATTLE, WASH. BEBB & GOULD, ARCHITECTS



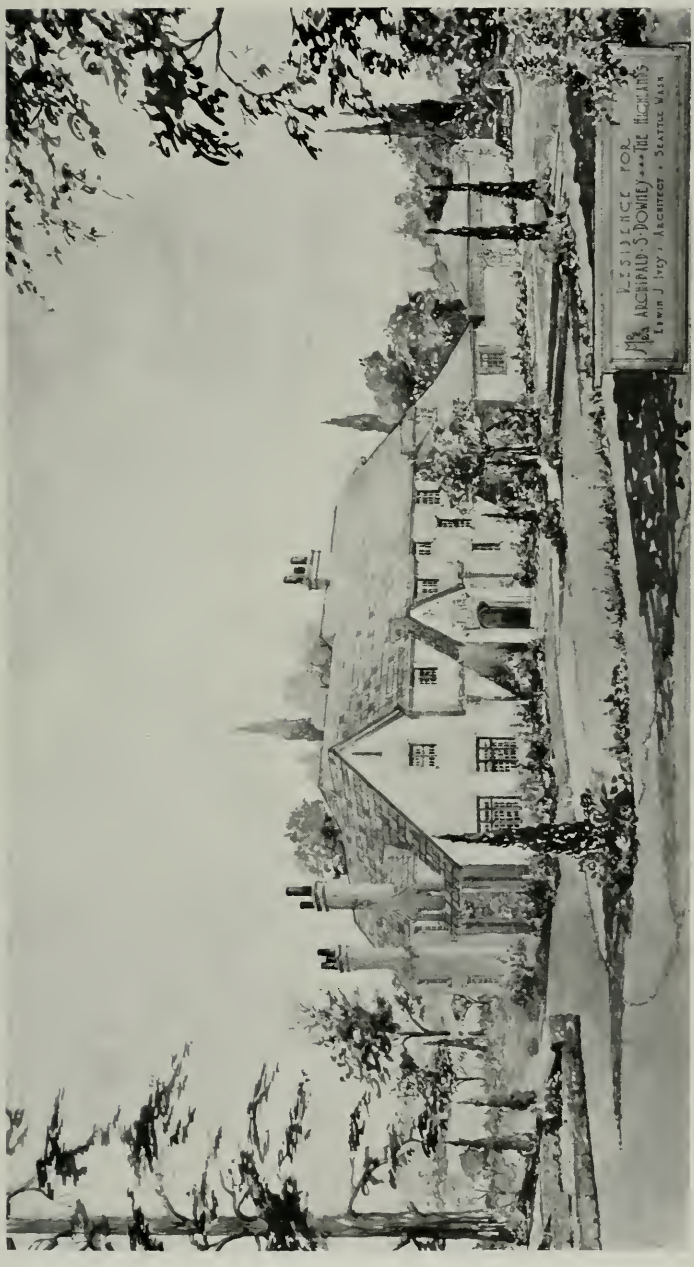
ANNIE WRIGHT SEMINARY, TACOMA, WASH.
SUTTON & WHITNEY ARCHITECTS



BETA THETA PI FRATERNITY HOUSE, UNIVERSITY OF WASHINGTON, SEATTLE, WASH.,
ARTHUR L. LOVELESS, ARCHITECT



HOUSE OF MR. B. A. GARBER, SEATTLE, WASH.
SCHACK, YOUNG & MYERS ARCHITECTS

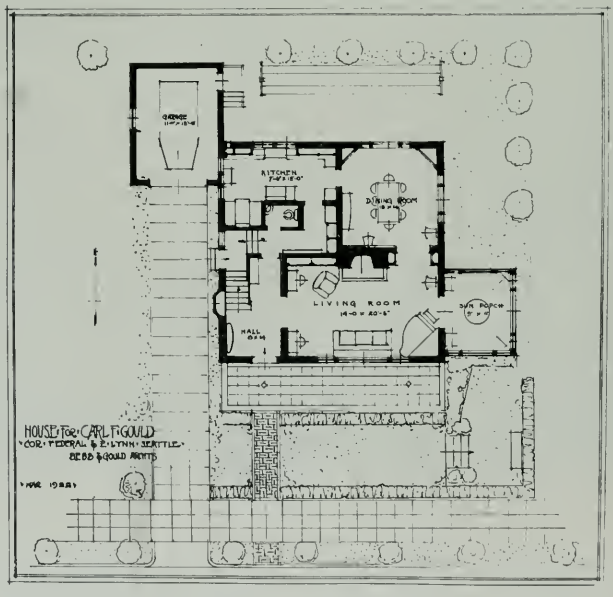


HOUSE OF MR. ARCHIBALD S. DOWNEY, SEATTLE, WASHINGTON
EDWIN JOHN IVEY, ARCHITECT

TRINITY CHURCH, EVERETT, WASH.
E. T. OSBORN ARCHITECT

TRINITY CHURCH, EVERETT, WASH.
E. T. OSBORN ARCHITECT

HOUSE OF MR. CARL F. GOULD, SEATTLE
Bebb & Gould, Architects



FIRST FLOOR PLAN, HOUSE OF MR. CARL F. GOULD, SEATTLE
Bebb & Gould, Architects

BEDROOM, HOUSE OF MR. CARL F. GOULD, SEATTLE
Bebb & Gould, Architects

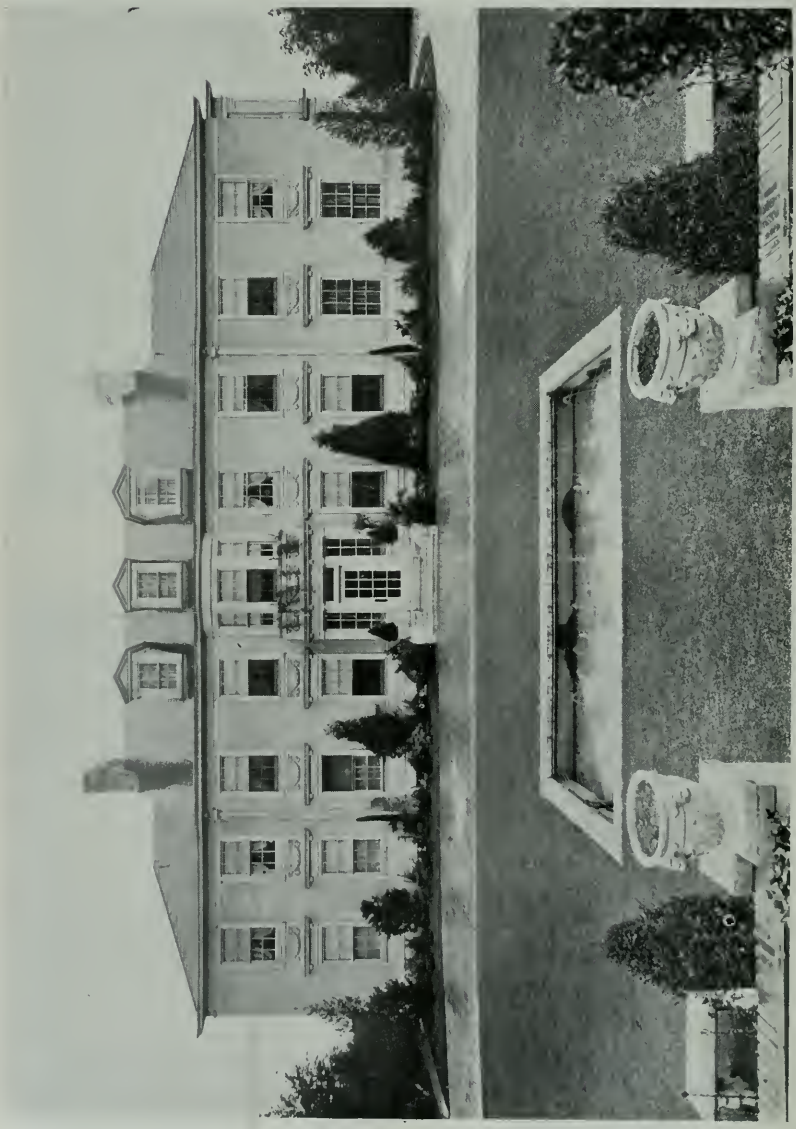
LIVING ROOM, HOUSE OF MR. CARL F. GOULD, SEATTLE.
Bebb & Gould, Architects

HOUSE OF MR. WILLIAM PIGOTT, SEATTLE
Joseph S. Cote, Architect

DRAWING ROOM, HOUSE OF MR. WILLIAM PIGOTT, SEATTLE
Joseph S. Cote, Architect

STAIRHALL, HOUSE OF MR. WILLIAM PIGOTT, SEATTLE, WASH.
Joseph S. Cote, Architect

DINING ROOM, HOUSE OF MRS. JAMES H. CALVERT, SEATTLE
Joseph S. Cote, Architect



HOUSE OF MR. JOHN W. EDDY, SEATTLE, WASH.
E. F. CHAMPNEY
ARCHITECT

Howard E. Andrews & Co., Landscape Architects.

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DANIEL R. HUNTINGTON
ARCHITECT

FREMONT BRANCH, SEATTLE PUBLIC LIBRARY, SEATTLE, WASH.
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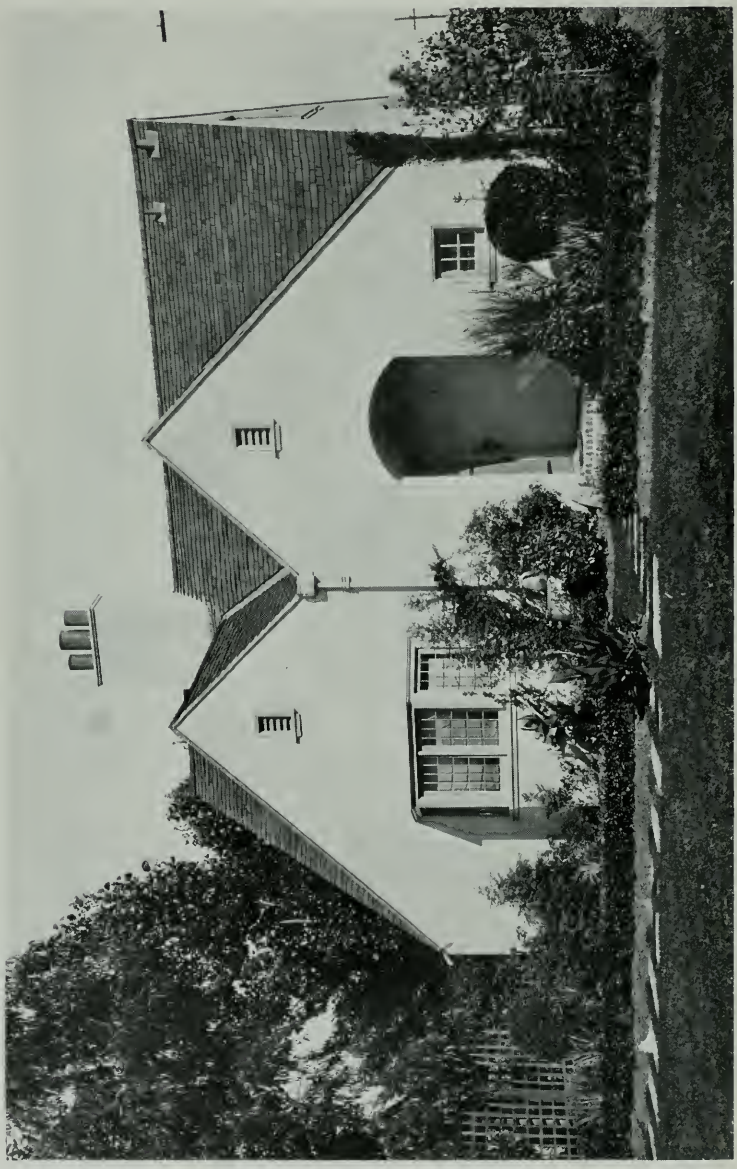
PANTAGES THEATRE, MEMPHIS, TENN.
MARCUS B. PRITECA ARCHITECT



HOUSE FOR MR. E. A. SOMERVILLE, SACRAMENTO
DEAN & DEAN
ARCHITECTS

WHAT SHALL WE DO WITH OUR CLIENTS?

By IRVING F. MORROW, Architect.

POSSIBLY the most neglected influence in the development of architecture is the client. It is commonly assumed that his sole function is the paying of bills; and in many cases this may be literally true. What is less distinctly realized is that even in this purely financial capacity he may be an indirect but none the less potent influence for good or evil. Yet when we reflect in how many ways his intervention may become direct and even aggressive, we begin to appreciate the far-reaching influence which he wields. The first choice a prospective builder is called upon to make is one of the largest significance. Who shall design his building? He is at liberty to select indifferently a good architect or a poor one, accountable for his choice to nothing but his intelligence or his conscience.

To the man in the street this is only as it should be. Does not the client furnish the money? and has not a man a right to what he wants for his money? If he happen to have money but lack intelligence or conscience or both, it may be a misfortune for the community; but only such a misfortune as communities have become apt in adapting themselves to through long practice, without definite expectation of redress. This attitude is a relic of the laissez faire conception of economics. I say a relic, not because that conception has been superseded, but because it at least recognizes the necessity for an aggressive defense; and anyway, most popular opinions or attitudes proceed from origins which are archaic, irrelevant, and even discredited. One of the most disheartening reflections attendant upon the achievement of any item in the program of mankind's spiritual emancipation is the practical certainty that, once accepted as just and reasonable, it will in a future age become an object of an oppressive veneration, and be cited as an obstacle to further advance.

But to get back a little closer to clients and their money—which, in the long run, must always be among the architect's chief concerns. From the point of view of pure theory the proposition that a man has a right to build what he wants with his money will not stand examination* If practice accords him that right, it is only because practice is not fully or equally abreast of theory in all of life's relationships. Theory advances like a portly gentleman out for a leisurely Sunday stroll with the family, with all the little tykes of practical applications toddling beside and at various distances ahead and in the rear. Ordinary police powers are competent to impose certain restrictions on what a man may perform on his own property with his own money. An operation creating offensive smells may be declared a nuisance and restrained. Our noses are still more sensitively developed than our eyes; nobody who owns the land and has the money can be prevented from erecting an unsightly edifice, even on Main Street or Liberty Square. In many economic relations the "public-be-damned" attitude is a thing of the past. Nobody is required to operate a railroad or a theatre or a hospital, etc.; but anybody choosing to do one of these or a hundred other things must conform to certain well defined restrictions, designed not for his own benefit, but for that of the public with whom he comes into contact. Is it, therefore, unreasonable to urge that, in theory, a man who elects to erect a building incurs

* I am sreaking of aesthetic values only. Of course it is accepted without question by everybody but real-estate speculators that, in so far as the safety of occupants or passers-by is concerned, it is reasonable that freedom should be limited by building laws.

an obligation to the public at large? even though we may admit that the public temper and intelligence of the day are little likely to formulate and impose such an obligation.

Of all artists the architect is, from the point of view of realization, the most unfortunately situated. While it is commonly realized that a certain degree of public appreciation must form the background for a fruitful output, yet, within reasonable limits, (and with certain exceptional characters even beyond them) the painter or writer or composer may paint or write or compose what he pleases. For the architect it is impossible to realize his conception until he has found somebody to finance it. This has tended to make the architect unduly subservient to his client; many clients, on their own merits, are not entitled to such deference. The successful practice of architecture requires a native aptitude and a high degree of training. The deficiency of the average layman in each of these requirements leaves him quite unqualified even to express an intelligent opinion, let alone dictate, on the questions at issue. If he is allowed the upper hand, not only his own building, but possibly the larger cause of architecture, may be the sufferer. To accord the client the right to build what he wants is tantamount to consigning the expression of the country's spiritual life to the hands of money-grubbers and speculators.**

For it must be realized that no number of trained architects, or no degree of efficiency in training, is going to avail if people who are unqualified are to possess a veto power over their conceptions. The reason that possibly four-fifths of our achitecture are mediocre or worse is not because the architectural profession is unequal to the problems before it. Leaving out some three-fifths deliberately awarded to parties unqualified to execute them, at least a half of the remainder, although done by competent designers, is blighted by meddlesome clients.† It is not only that large numbers of our buildings have to be erected with funds inadequate to the purpose. Within reasonable limits that is a deficiency which insight and ingenuity can minimize. More serious is deliberate tampering with design—the insstance on certan features or the proscription of others, against the advice of the architect. The people who "don't know anything about art, but know what they like" would never dream of telling their physicians that they don't know anything about medicine, but know what they like to take. I have known a man who sought successive physicians until he found one in whose diagnosis he acquiesced, but at least when an acceptable ailment was hit upon, he submitted to his physician's treatment with due humility. Now a prospective builder is at liberty to choose his architect in the light of his own prepossessions, and the result of an intelligent choice should be accepted with humility. If by inadvertence the choice prove to have been from, his point of view, a mistaken one, he is at liberty to try another architect.††

But the most serious obstacle in the way of vital architectural development is not a client's penchant for or against this or that style or feature of design. These in the long run may be little more serious than similar prejudices on the part of the architect, except in so far as they are generally less well informed. The heaviest hand which falls on the

** Possibly this is where it belongs.

† My figures are only assumptions; in the face of accurate statistics they would probably be found to be conservative. But I prefer not to seem too unreasonable.

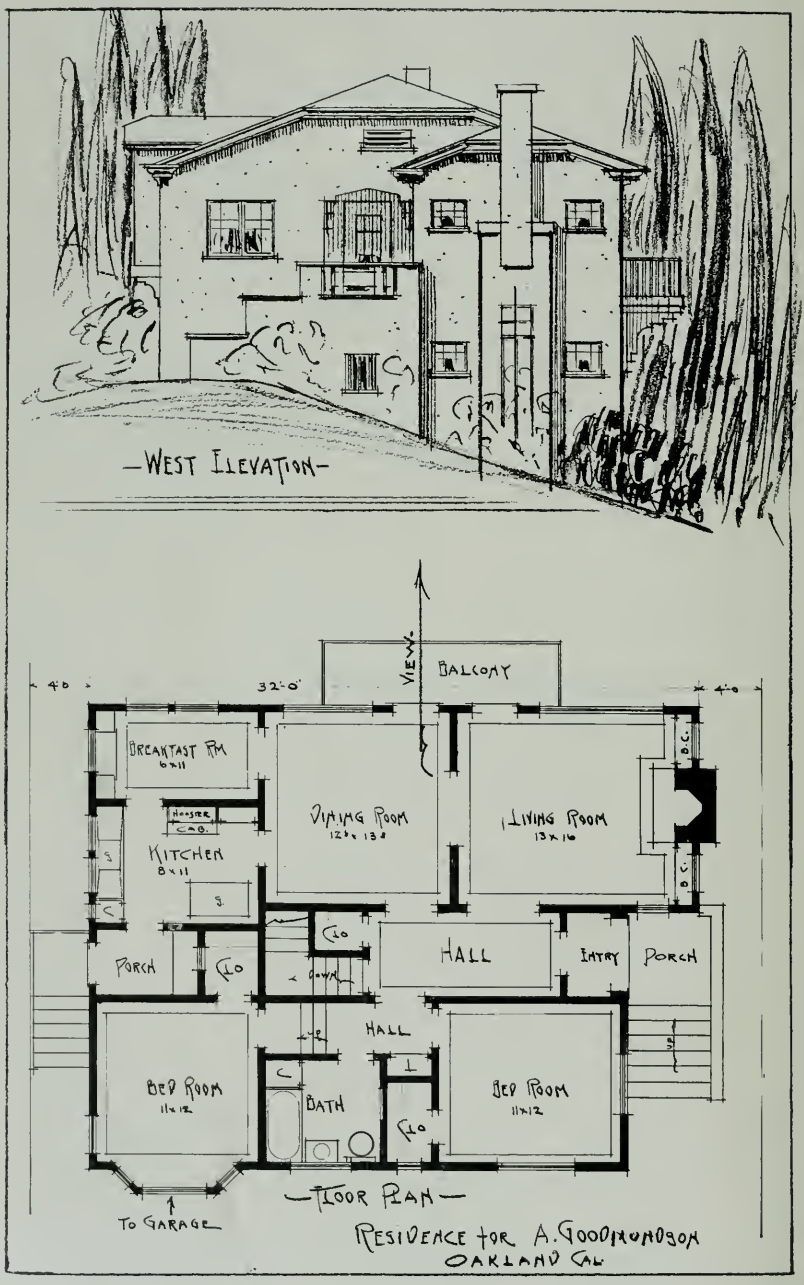
†† The great obstacle to so straightforward a course is that the first architect generally insists on payment for his services; and the average layman "can't see" paying an architect for plans he has not built, even though he would never dream of ordering a meal from a restaurant keeper and denying payment because he decided not to eat.

cause of architecture is that of stupid conservatism in the face of enlightened parties and policies. When the architect—who is ideally no mere scratcher of plans and elevations, but a constructor and philosopher of life in the larger sense—conceives a building embodying new or unusual, but none the less logical and beautiful, arrangements and interrelations of parts, consider the loss incurred by life and art just because one unenlightened client "can't see it"! How are we ever to develop living architecture, buildings responsive to and expressive of the best vision our civilization affords, if the people for whom we try to design them do not know how to use them and live in them? People who lead stupid lives will not tolerate intelligent surroundings. Argument is useless; are they not building their own buildings with their own money?—a right, as I said before, which society has not yet questioned.

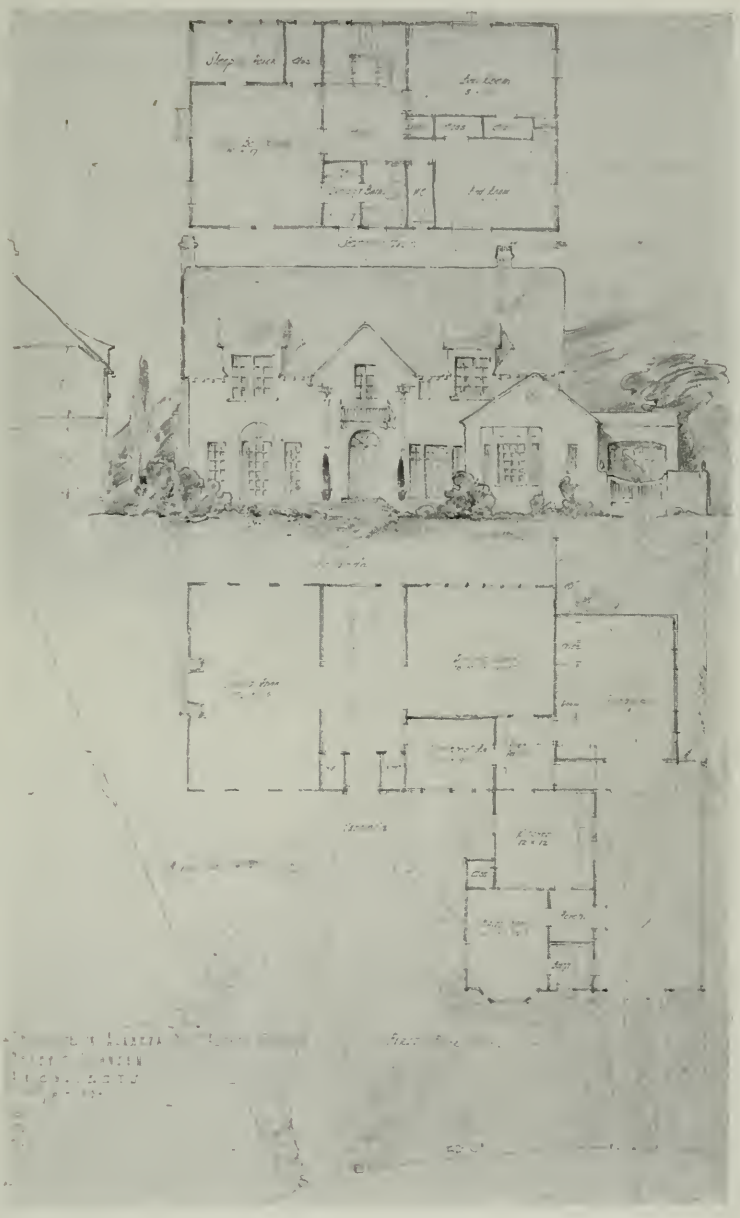
There arises then a problem as fundamental and as serious as any occupying our best minds. It is all well and good to ask what are we going to do about the heathen in Manchuria, and the Russian debt and oil concessions in Mexico; but in the meantime, what are we going to do about our clients? A Tag Day or a Clients' Week, the recognized devices for getting ordinary domestic problems quietly and harmlessly out of the mind, would scarcely scratch the surface of the difficulty. Yet any architect who has ever known the rare inspiration of a truly receptive and, I might say, creative client, will realize the possibilities foreshadowed.

Nothing which I have said, of course, should be understood as advocating compulsion. There is no method of furthering an ideal so stupid as censorship of conflicting ideals. If the work of stupid clients can be circumvented only by according architects dictatorial powers in spite of them, then indeed is the cause for a living architecture a rather hopeless one. The prospective builder may be under a moral obligation to society, but it is an obligation which only his own intelligence and conscience can successfully enforce. Getting good architecture is a game at which two must play; it requires a client intelligent enough to desire it and recognize it when he sees it, and an architect intelligent enough to conceive it. I have already indicated my belief that the architectural profession, is by and large, equal to its job.

As to the client, if he must show equal intelligence, and must do so as a free agent, it comes down to the simple fact that he must be educated. The architect sometimes tries it. At times it works and everybody is happy; at other times he loses his client for his pains, although this may often be chargeable to faulty diplomacy. Oftenest he struggles until patience is exhausted, loses all interest, and does anything to get the job out of the way. After all, training clients, at least in any fundamental sense, should not be part of the architect's services. It is arduous, distracting, and not covered by any recompense—as a matter of fact, clients are apt to grudge payments to architects at all in exactly the proportion that they require training themselves. No, the client should come to the architect substantially trained. It is a matter of general eductaion. How? In the schools? In the home?—I have heard discussions among educators, and I am going to stop right here. Anyway, if I insist that the architect prevail in his field, I suppose logic requires an admission of the right of the educator to do the same in his, much as it hurts to accord it. But I will say before relinquishing the floor that it is going to be a long up-hill process; and in the meantime we shall have to sit tight, grin, and bear a good deal.



ELEVATION AND PLAN OF HOUSE IN OAKLAND
L. H. FORD ARCHITECT



RESIDENCE FOR MRS. ALFRED COOGAN, ALAMEDA
MEYER & JOHNSON ARCHITECTS

DESIGN FOR PLASTER BUNGALOW
H. C. Baumann, Architect

FRAME HOUSES AND THE FIRE HAZARD

By WILLIAM BAYLESS.

FRAME construction has been the target of unjust criticism quite long enough, in the opinion of the lumber industry. As a type of construction it has been subjected to the most intemperate attack by those who sponsor substitute materials. In a country where so many frame dwellings are soon to be built it seems a matter of great consequence, therefore, that inaccurate statements or unsound deductions bearing upon this subject should not be suffered to pass unanswered.

Reports containing figures giving the number of buildings of various types together with the number of fires occuring during the year 1920 in each of the types for 83 cities (of 20,000 population and over) of the United States, have just been examined and summarized by the Technical and Research Department of the National Lumber Manufacturers Association. The first discovery was that there were only two-thirds as many fires per hundred frame buildings as there were fires per hundred buildings of other types, although frame buildings outnumbered all other types of buildings more than three to one.

There were sixteen fires per thousand frame buildings and in buildings of other types there were twenty-five fires per thousand buildings. It has been stated over and over again that frame buildings with shingle roofs were the principal cause of communicated fires and that communicated fires represented the major percent of annual fires and fire losses in this country. Yet in 83 of our cities (in the year 1920)

98.7 per cent of all fires were confined to the building or place in which they originated. Communicated or exposure fires were reported as including some fires that did not have their origin in building fires. The communicated fires represented 1.3 per cent of the total number of fires, and only one-fifth of one per cent of the total number of fires extended beyond the buildings immediately adjoining the places of origin. The loss from communicated fires was 7,34% of the total loss. No figures are available for the number of fires communicated to or from frame buildings but it is well known that the majority of exposure fires occur in business and mercantile districts where frame construction does not predominate. And then, even if all exposure fires were from frame building to frame building, they would represent only 2.8 per cent of the frame building fires. Our greatest losses occur in those districts where other types of construction prevail.

In presenting these figures the Technical and Research Department of the National Lumber Manufacturers Association wishes to emphasize the fact that the information is not presented for the purpose of creating an impression that frame construction is superior to all other types for all purposes. It does wish to show, however, and to show conclusively, that for the uses to which frame construction is now commonly put, it is the best form of construction. That is use wood where wood is best.

At the present time, however, even with the ratio of fires in frame buildings so much less than in other types, there are cases where frame construction is used for purposes for which it is totally unsuited—where, for instance, it accommodates occupancies that are serious fire hazards. But even under such conditions it has been more generally satisfactory than other types of buildings.

The methods of constructing supposedly fire-proof buildings have been constantly improved. It is true that the hazard of occupancies has become greater at the same time (though not at the same rate as improvements in methods have taken place). In the face of all this, the per capita fire loss has not been reduced. In fact it has steadily increased.

As far as reduction of losses is concerned the facts herein set forth clearly indicate that it is useless to replace wood where it is now used, with other materials. Attention should rather be given to ways of providing for the very hazardous occupancies and the carelessness of occupants. Attention to these matters will go further to reduce the great annual fire loss than all the efforts of those who are making such a strenuous attempt to replace wood with their pet materials.

Looking back over the years the degree of carelessness of the occupants of buildings seems to have increased in proportion to the added degree of fire protection. A residence built of materials that will not readily burn increases the occupant's negligence and general carelessness. In this connection, the opinion of one whose daily contact with the fire problem in a mid-western city should be interesting. Daniel F. Shire, Chief of the Fire Department at the Rock Island Arsenal, Rock Island, Ill., in a statement which appeared in the March, 1922, issue of "Fire and Water Engineering" said:

"The only persons who can prevent loss by fire are the owners and occupants of the premises—upon them rests the responsibility of loss in nearly every fire."

The high esteem in which wood as a building material is held by those who have a thorough knowledge of the conditions, is shown in another statement by Mr. Shire in the same magazine. He says: "Fireproof construction means nothing to you if it is not safe construction. I would rather go up against good safe mill construction than the so-called fire-proof building any time, and so would you."

The following summary based on figures appearing in the 1921 report of the Committee on Statistics and Origin of Fires of the National Board of Fire Underwriters, should be of interest to all those who have been bombarded with literature and other forms of propaganda, eminating from interests whose sole object seems to be to discredit frame construction:

Summary of Report.

Type of Building	Number of each type in cities	Number of fires in each type
Reinforced Concrete	2589	163
Fire Proof (Steel Frame)	3421	92
Brick and Stone	283432	6877
Iron-Clad	2809	136
FRAME	944494	15637
Concrete Block	5305	148
Buildings not classified	12112	336
Total Buildings	1254192 Total Bldg. Fires	
	Other than Bldg. Fires	11108
	Total Fires	34497

75.3% of all buildings were frame.
1.65 fires per 100 frame Buildings.
2.43 fires per 100 brick and stone Buildings.
250 fires per 100 of all buildings other than frame.
330 fires extended to the adjoining building only.
70 fires extended beyond the adjoining building.
1.1% of all fires extended to the adjoining building.
.2% or 1/5 of 1% of all fires extended beyond the adjoining building.
98.7% of all fires were confined to the building or place or origin.
Ratio of frame buildings to brick and stone buildings 3.33 to 1.
Ratio of frame buildings to all buildings other than frame 3.27 to 1.
Total loss to buildings and contents.....$23,707,411
Loss caused by communicated fires—7.34 per cent of total.....$1,741,108

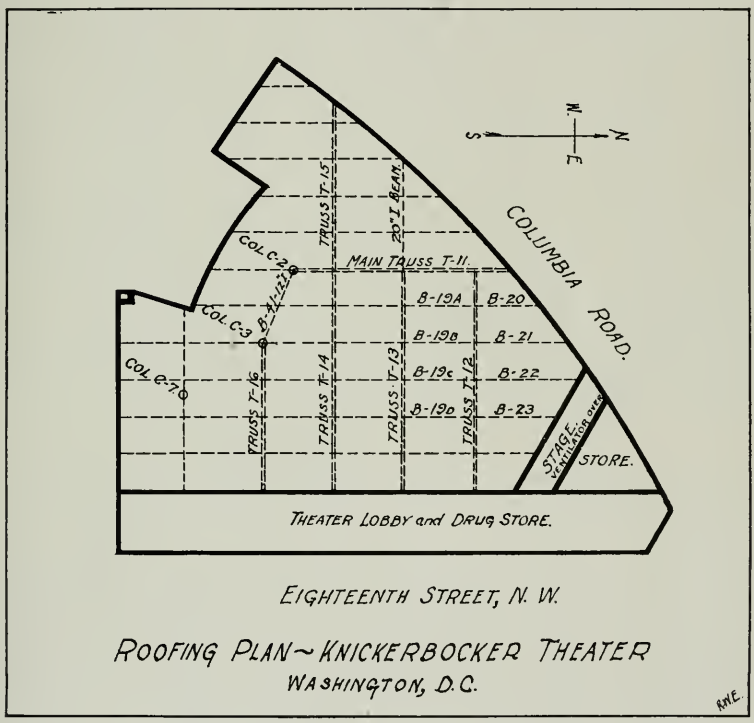
NOTE.—Communicated fires include some fires that did not originate in buildings.

TILE WALL CONSTRUCTION NOT SAFE WHEN CELLS ARE VERTICALLY PLACED

By EDWARD GODFREY, C. E.

IN your March issue Mr. Ross Wilton Edminson gives an account of the Knickerbocker Theater failure. Unfortunately, for your reader's information, the one great fault, or combination of faults, with the construction of that theater, and the one that is without doubt the sole cause of the disaster, was not mentioned.

I refer to the support of Main Truss T11, as shown in Mr. Edminson's plan in your March issue. This truss was supported on a wall having an inner shell of tile built with the cells vertical and an outer



[Reprinted from the March Number of The Architect and Engineer]

shell of brick. Ten years ago I called public attention to the error of this type of building walls carrying loads. It is faulty in two ways, as described in the following two paragraphs:

First, a tile wall cannot be commercially built strong when the cells are placed vertical. The reason is that there is no surface to receive the mortar for a horizontal joint. No tile layer is going to putter around laying mortar on the thin ribs of a tile. In any event these ribs may not "register" in two tiles placed one above the other. The workman will put on just enough mortar to steady the tile and furnish a joint on the face of the wall. If a close steel mesh were laid in each hori-

zontal joint, a good joint could be effected, but this is laboratory stuff.

Second, a combination of a yielding shell, such as the tile backing in a wall, and a rigid shell, such as the brick facing, does not make a proper wall for support of loads. Many cases of this have come under my observation. Some of the combinations are: Face brick with thin joints and common absorbent brick with thick joints (shrinkage in the thick mortar joints); cast or cut stone facing with thin joints and concrete or rubble stone backing; brick facing and tile backing. The improper character of the walls has manifested itself in bulging and in spalling or cracking of the outer shell, and in one case disastrous failure of the reinforced concrete construction supported by the piers and walls.

In the Knickerbocker Theater Main Truss T11 was supported on a wall (the Columbia Road curved wall) composed of an outer shell of unyielding brick and an inner shell of yielding tile, laid with the cells vertical. There is no doubt that this inner shell yielded enough to give the truss support a slope. This truss had only to work off laterally in order to become unseated, for there were no anchor bolts into the wall, and there was no connection of steel work near the end of the truss, as will be seen by reference to the plan.

Any jarring, as of street car traffic, and any expansion and contraction would help to move this truss off its sloping seat. The lateral motion would not crack the ceiling, for the ceiling was not attached to this truss. When the last jar occurred and the truss slipped off the wall, the great weight gave the wall a final shove, causing the cracks at the corners and the outward leaning of the wall.

There were no doubt other weak features in the design and construction, but weakness that causes such utter ruin must be more deep seated than merely relative weakness.

"TOO LATE," THE SADDEST WORDS IN CITY BUILDING

A prominent real estate operator of Kansas City recently made the following timely utterance:

"The words "too late" are the saddest words in city building. Particularly in our small cities, of a hundred thousand to two hundred thousand, it is not too late to correct many of the abuses of the past. When you erect a light office building do you realize that the intensive use of automobiles today regulates the height of your building, or do you go ahead and build it as high as you can under the ordinance of your city? Do you realize that values are going to be rendered unstable in our cities if we continue to crowd buildings on the down-town streets making business conditions impossible? The automobile always selects a through street. It selects well paved streets, thereby increasing the expense on certain highways.

"It is in the haste of things that we plan only for today in our cities and forget the needs of tomorrow. For example, in Oakland they have been working on a plan for years of a municipal railway, and there had come up the matter of location of a large private shipbuilding plant that would block forever that city accomplishment, yet it was just as possible to place this plant at another point and not interfere with this municipal railway. It is the things done without thinking of tomorrow that injure our cities in the future.

CONCRETE BUILDING ERECTED WITHOUT FORMS OR SCAFFOLDING

THE erection of a concrete building in a single afternoon by means of giant screw jacks that raise a solid wall at one time is accomplished through a scientific system of construction invented by Col. Robert H. Aiken of Washington, D. C., and executed by Messrs. Snowden Ashford and Carroll Beale of the same city. The work is completed without the use of forms and scaffolding, and without "pouring" the concrete in the customary way. This is how it is done, as explained in the March issue of Popular Science Monthly:

The basement floor is laid in the usual manner and finished smooth to a level. The hoisting-jacks and trusslike girders are aligned in front of this floor, and upon the girders loose planks are laid transversely, until a platform the size of a side wall has been built. All the windows and door frames are laid on the platform, and concrete is poured around them.

At the same time all the details of the completed wall are cast in place, either by nailing an insert or print-block to the platform, or by carving a design into it, according to whether the ornament is to project from the wall or not. The four walls of a concrete house of ordinary size can be molded in about two hours. The concrete on the platform for each wall is then allowed to set for three days, until it becomes thoroughly dry and hard.

Next comes the hoisting of the walls. By means of a common driving-shaft, all the jacks are connected with a low-power gasoline engine, and as this is started the platform and wall, pivoting on one edge, rise slowly into place without any risk of breaking during the ascent or of rising past the vertical and falling in the other direction. Such mishaps are made impossible by the careful designing of the jacks and guides.

Once erected, the walls are united at the corners by casting pillars of concrete at the joints.

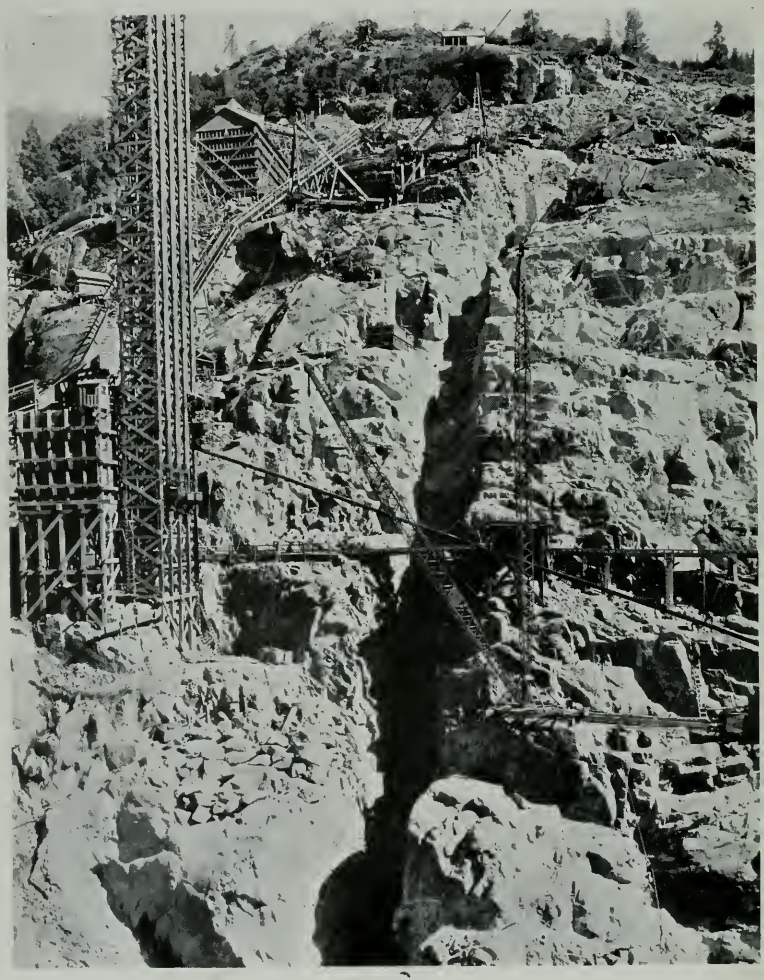
With this method it is possible to raise an entire factory in a day, or to build an entire row of houses at one time. In the latter case, three or more fronts are raised one after another during one working day, with one crew using the same equipment.

APARTMENT HOUSES BEING EQUIPPED WITH RADIO PHONES

Several of the large real estate companies in New York report that so many requests have been received from tenants desiring to erect aerials that they are planning to wire a number of the larger houses along Park street and Fifth avenue and equip them with radio telephone service. It will be much less expensive and far more satisfactory to have one large aerial for the house than to have a number constructed by individual tenants.

The demand seems to be strongest where there are children, especially those of the high school age. Radio instructions are being given in all schools and undoubtedly wireless phones will become a household convenience in the near future.

Philadelphia also includes wireless equipment in its specifications for a number of new apartment buildings now under construction, and in San Francisco and Los Angeles, several architects are reported to have made provision for radio equipment in new buildings in course of study. In Piedmont the new High school, designed by Architect W. H. Weeks, is to have one of the most complete radio plants on the Coast.



HETCH-HETCHY DAM CONSTRUCTION, SOUTH ABUTMENT AND CONCRETING PLANT AUGUST, 1921

CONSTRUCTION FEATURES OF HETCH HETCHY DAM*

CONSTRUCTION is now well advanced on the Hetch Hetchy dam of the new water supply development of San Francisco.

The dam is to be of the gravity type, arched in plan, with the radius of the up-stream face at the crest 700 ft. The principal dimensions are as follows:

	Initial.	Ultimate.
Total length on crest, in feet	600	900
Height of crest above stream level, in feet	226	312
Depth from stream level to bed-rock, at toe of dam, maximum, in feet	101	101
Total height of dam, above bed-rock, in feet	327	413
Width at top, in feet	15	25
Width at base, maximum, in feet	298	298
Volume of masonry, in cu. yd.	375,000	660,000

Most of the dam will be of 1:3:6 concrete embedded with large stones. For the concrete against the foundation, the cut-off trench, the up-stream face, and the down-stream face in the spillway section, a 1:2½:5 mixture is to be used to give greater impermeability.

The limiting working stresses in the design were as follows:

	Tons per sq. ft.
Pressure normal to joint, up-stream toe:	
Reservoir empty	25
Reservoir full	16
Maximum pressure in section, under worst combination of conditions and lasting for comparitively short periods of time	27.5

No tension was permitted in the concrete. On each joint, upward water pressure was considered as acting at the up-stream face with an intensity of two-thirds the total hydrostatic head and diminishing uniformly to zero at the down-stream face. On the foundation joint, an upward pressure of two-thirds the hydrostatic head due to the backwater was also considered.

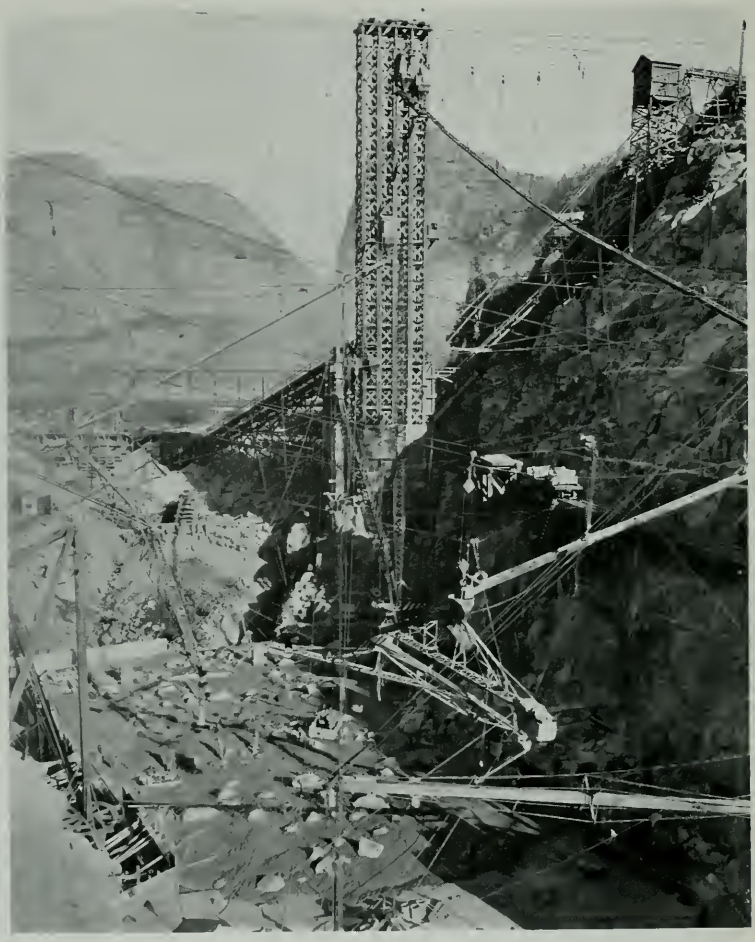
The dam is to be penetrated by a system of inspection tunnels, inspection wells, and drainage wells. The inspection wells will be lined with dense concrete blocks and equipped with ladders. The drainage wells will be in porous concrete blocks and will be 15 in. square.

Radial contraction joints, sealed by bent copper waterstops, are provided at intervals of about 100 ft., measured along the up-stream face. Each contraction joint bisects an inspection well. The crest of the dam will be used as a roadway, in both the initial and ultimate developments.

The ultimate dam will have a spillway of the weir type, with a channel to carry the waste water around one end of the dam. A siphon spillway has been adopted for the initial dam, and will be in eighteen sections, staggered in elevation to obviate vacuum effects, with a total length of clear openings of 180 ft. 6 in. Each section will be 8 ft. high at the entrance, tapering to 4 ft. at the crest of the siphon, and will have two air vents, each 12 by 24 in.

There will be twelve outlet conduits, six of which will be each 5 ft. in diameter, and arranged in pairs at three levels. These will discharge water (in quantities up to 3,000 sec.-ft.) which under certain conditions of river flow is to be permitted to pass the dam for the use of irrigation districts in the lower reaches of the Tuolumne River. Each of the other six outlets will be 3 f. 6 in. in diameter, in two groups of three, and will discharge the water for the city supply. The smaller outlets will ultimately discharge directly into the acqueduct tunnel to be constructed in

*Old Mission Portland Cement used on this project.



POURING CONCRETE IN HETCH-HETCHY DAM, NOVEMBER, 1921

connection with the future power development at Early Intake, whereas the water for irrigation may flow directly down the bed of the river.

The discharge in each conduit will be regulated by balanced needle-valves with the Larner-Johnson type of control. At the entrance to the conduit there will be a slide-gate with hydraulic cylinder operation. A heavy reinforced concrete shutter may be lowered through a slot in the wall of the outlet structure to close the opening on the up-stream side of the slide-gate, thus providing access to the gate for inspection or repairs.

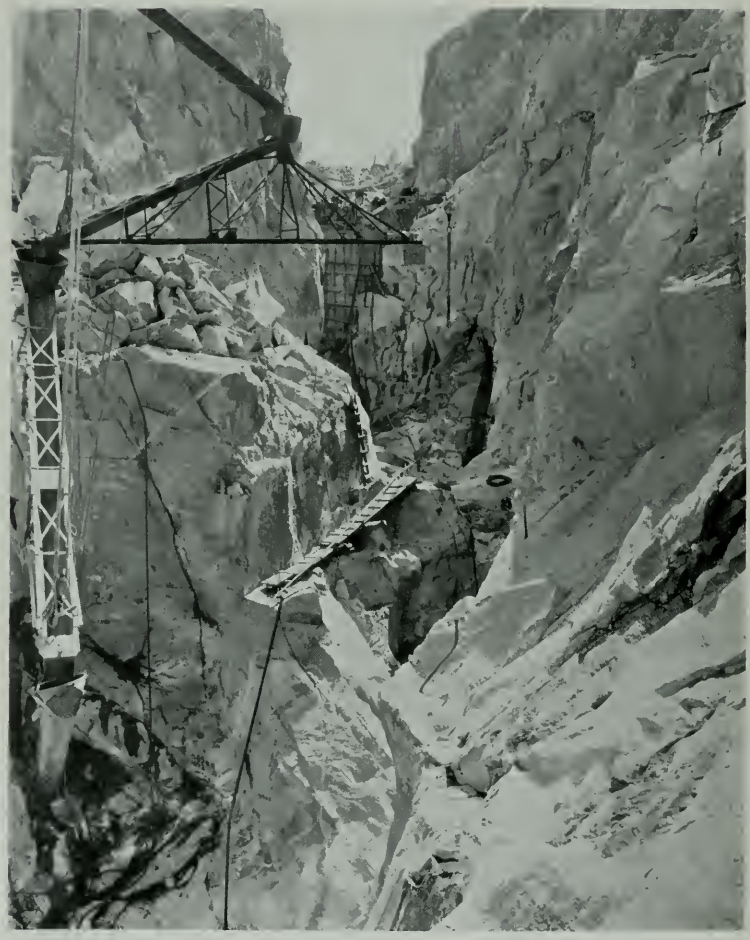
The maximum measured flood flow of the Tuolumne River at the dam site, during the ten years for which records are available, was 12,700 sec.-ft., and the stream-control works were planned for approximately that quantity of water.

GENERAL VIEW OF SOUTH SIDE AND BOTTOM OF DAM SITE

The river is by-passed around the dam site through a tunnel 23 ft. high, 25 ft. wide and 900 ft. long. The lower group of three 3 ft. 6 in. outlet conduits will be placed later in this tunnel.

The diversion dam is a rock-filled crib 321 ft. long, of 12 by 12 in. timbers. The up-stream face is sheathed with a double layer of 2 in. plank, with a layer of tarred burlap between. A maximum head of 13 ft. over the top of the tunnel was provided to dispose of the flood waters.

A concrete dam was built just up-stream from the lower portal of the diversion tunnel, to prevent water discharged through the tunnel from backing up into the dam site. This dam was founded on boulders and course gravel, and is 51 ft. long on top. Its foundation was grouted to secure water-tightness.

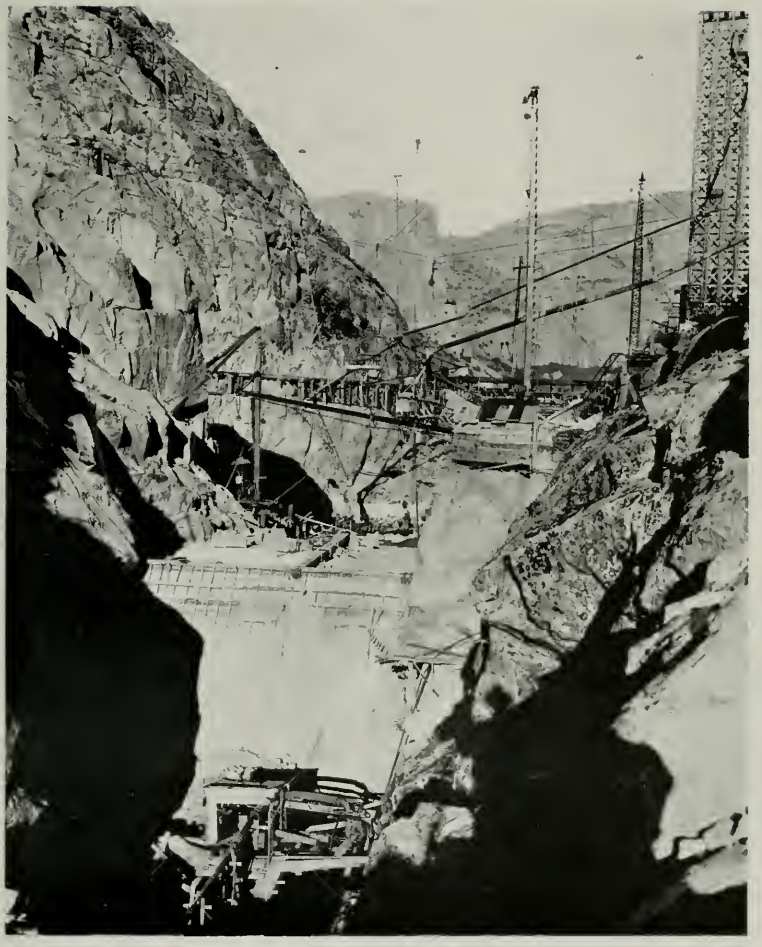


HETCH-HETCHY DAM CONSTRUCTION, SHOWING BOTTOM OF FOUNDATION

The contract for the construction of the initial development of the Hetch Hetchy dam was awarded on Aug. 1, 1919, to the Utah Construction Co., at a total estimated price of $5,447,972. The principal items were:

	Approximate quantities	Unit prices: Below original stream bed	Unit prices: Above original stream bed
Excavation in dam foundation:	in cu. yds.		
Earth and loose rock	65,000	$ 8.00	$ 1.50
Solid rock	100,000	11.20	3.00
Cyclopean masonry, 1:3:6: concrete with at least 10% of plumbs	300,000	11.80	11.00
Mass concrete, 1:2½:5	75,000	15.00	14.30

A steam shovel was used for the greater part of the excavation in the dam site, loading directly into dump cars. When the space became too cramped to permit steam shovel operation, the final 20,000 yds. were



POURING CONCRETE IN HETCH-HETCHY DAM, NOVEMBER, 1921

loaded into the skips by hand. The skips were emptied into trains running on trestles along the north and south walls of the gorge.

Excavation on the sidewalls and in the cutoff trench above the stream bed level was carried on by drilling with jack-hammers and shooting and barring down the material to the river bed, where it was loaded into trains of narrow gauge 4-yd. side-dump cars by a Marion No. 36 steam shovel on crawler treads. The trains were hauled by 18-ton saddle-tank locomotives to a waste bank near the crusher plant and the excavated material was dumped there, where it can be readily re-excavated to be screened and crushed for concrete aggregation.

On reaching the river bed level the steam shovel was used in excavating the foundation pit for a depth of 65 ft. to elevation 3,435. In the lower part of the steam shovel excavation, the trains operated on

a very steep incline, with a maximum grade of 20 per cent. The trains were worked on a counter-balanced system, the empty train entering the pit helping the loaded train up the steep grade.

The total excavation for foundations was 165,000 cu. yd., of which 100,000 cu. yd. was solid rock. The trains dumped the material on the floor of the valley and much of the dumped rock will be used for concrete aggregate. Large rock fragments and boulders were placed by derricks on convenient corners and ledges for storage until required for plumbs in the cyclopean masonry. The lowest point in the foundation is 118 ft. below the original stream bed.

Nearly all the surface rock in the foundation above the stream level was removed, leaving a newly broken granite surface to receive the concrete, but below that level, where the rock had not been exposed to weathering, the trimming covers a much smaller proportion of the whole surface. The underlying formation is very tight. The foundation below the former stream level is being prepared to receive the concrete, largely by sand blasting, which removes scale and soft pits satisfactorily and roughens the polished surfaces. Loose sand and dust are removed by washing and brushing with wire brushes.

Excavation to bed-rock was completed in August, 1921, and immediately afterward the pouring of the concrete was commenced. The dam is expected to be completed by March 1, 1922.

To handle the material from the deep excavation, one steel derrick with 100 ft. boom, one with 110 ft. boom, one wooden guy derrick with 70 ft. boom and one with 60 ft. boom were used overlaping to cover all points in the lower portion of the dam. In connection with the derricks a high railroad line was built on the south abutment at elevation 3,540, connecting with the valley railroad system by crossing on the diversion dam, and a railroad track was placed at the same elevation on the north abutment. Dumping platforms were arranged on these railroads, enabling the derricks to unload 3-yard skips directly into the dump cars. the derricks are now used in connection with the concrete work, to handle loaded skips of plumb rock from the flat cars to the cyclopean masonry without interfering with the pouring operations.

A 15-ton Lidgerwood cableway with a span of 903 ft. of 2¼ in. cable, supported on towers 528 ft. above the bottom of the foundation pit, and having a speed of 900 ft. per minute, is in use. The cableway is so placed as to permit handling the 5-ft. balanced valves on the face of the dam and the three-foot valves down the shaft to the diversion tunnel.

Machinery, industrial locomotives and other heavy equipment, lumber and timbers, etc., are handled by this cableway from cars standing on the track of the Hetch Hetchy R. R. to the narrow-gauge cars of the contractor's industrial railroad on the valley floor level. The drop from one track to the other is over 300 feet.

Employees quartered at the main camp are lowered to and raised from the work in a skip suspended from the cableway. It requires but four minutes time to transport 55 men from the foundation pit to the camp level.

A narrow-guage valley railroad was built to haul the excavated material from the dam foundation to the dump in the valley, to bring sand and rock from natural deposits and from the dump and quarries to the crusher plant for washing, screening and crushing, and to haul the crushed rock and clean sand to the concrete mixing plant at the dam.

A rock crushing plant to produce aggregate for concrete has been erected on the valley floor. The material, ranging from sand up to boulders and rock fragments about 1 cu. ft. in volume, is brought to the plant in trains of 4-yd dump cars. It is passed over a grizzly with bars spaced six inches apart. The rock which does not fall through the grizzly is crushed by a 26 in. by 42 in. primary jaw crusher.

From this crusher a 30-in. belt conveyor carries the crusher-run rock and the material that passes through the grizzly to a ¼ in. mesh revolving screen. The fine material or sand passing through this screen goes to a log washer, and the coarser material is run through a 2½ in. revolving screen, the rejects continuing to a No. 6 McCully gyratory crusher and a No. 49 gearless, belt driven Kennedy-Van Saun crusher, set for producing 2-in. rock. The re-crushed rock is carried to a revolving ¼ in. manganese steel screen into which jets of water under high pressure are sprayed, separating all crusher dust and diverting it to the sand washer.

After the final crushing of the rock and washing of the sand, these materials are elevated on belt conveyors to a trestle 38 ft. high and discharged into storage piles, one for rock and one for sand, under which are two trap tunnels with mining dump doors, spaced 14 ft. on centers. This storage has a capacity of 8,000 cu. yd. of sand and crushed rock. From the storage piles 4-yd. side dump cars are loaded with aggregates by gravity, the spacing of the trap doors permitting all the cars of a train to be loaded without moving the train.

The concrete mixing plant, with a capacity of 100 cu. yd. per hour, is located near the up-stream face of the dam on the south abutment, at 3,540 elevation, 158 feet above the lowest point in the foundation pit and 187 ft. below the crest of the dam.

This plant consists of two 2-yd motor-driven Ransome mixers, with a charging bin of 300 cu. yd. capacity elevated above the mixers. The sand and rock brought in the dinky trains from the crusher plant are dumped into small receiving bins and elevated by motor-driven belt conveyors to the charging bin. Immediately below the charging bin are measuring bins, with a fixed choke feed and inlet gates operated by hydraulic cylinders. The gates from the measuring bins are also operated by hydraulic cylinders, the mixer man manipulating a 3-way valve to move both gates. Adjacent to the receiving hoppers of the mixers are the cement measuring bins, which are filled from the weigher house, 180 ft. above, through two 8-in. riveted steel pipes. Water for the mixers is pumped from the river into a 10,000 gal. tank on the adjacent hillside and the quantity for each charge measured in a steel drum mounted on the mixer.

The spouting system is used for placing concrete. A four-compartment elevating tower, 10 ft. by 27 ft. in horizontal dimensions, and 150 ft. high, has been built of Oregon pine timber. Each compartment is equipped with a self-dumping 1-yd. steel skip. The skips are operated independently by single drum hoists driven by 75 h. p. motors and are capable of a speed of 300 ft. per minute. The tower is designed to have an ultimate height of 340 ft. It is built up of four 10 in. by 12 in. and four 10 in. by 10 in. timbers, thoroughly sway-braced, and guyed with ¾ in. cables at every 40 ft. of its height. The concrete will be distributed from the tower through two lines of 15-in. Insley chutes, with 50-ft. counter-balance sections.

All cement, except the relatively small quantity required for concrete blocks and miscellaneous small jobs, is delivered to the job in bulk. The box cars in which the cement is brought to the dam site over the Hetch Hetchy R. R. are emptied by means of an unloader consisting of a small motor driven winch which drags a flat board scraper. The cement falls from the car doorway into a hopper, from which a 12 in. screw conveyor takes it to a storage bin 150 ft. away, which bin is 60 ft. long, 32 ft. wide and 34 ft. deep, built with a V-shaped bottom, making the entire 13,000 bbl. capacity (about 60 carloads) live storage. From the bin a 12-in. screw conveyor 120 ft. in length carries the cement to a weigher house. This conveyor runs through a 4 ft. by 6 ft. tunnel beneath the storage bin. Slide trap doors are arranged along the sides of the tunnel to release the cement from the bin.

The weigher house is equipped with two 1,200 lb. capacity scales with automatic feed and cutoff arrangements. Electrically operated signals, consisting of flash lights and horn sounders, and an independent telephone line provide means of communication between the weigher house and the mixer house 180 ft. below. Two 8-in. steel pipes on a 1-to-1 slope carry the cement from the weigher house to the cement measuring bins near the mixers. The Hetch Hetchy Water Supply Department is being carried out under the direction of an engineering staff of which Mr. M. M. O'Shaughnessy, city engineer of San Francisco, is chief engineer, and N. A. Eckert is project engineer.

The foregoing article was prepared from a paper, "Construction Progress of Hetch Hetchy Water Supply," by Mr. O'Shaughnessy, in the February Proceedings of the American Society of Civil Engineers, and from the annual report of the Bureau of Engineering of the Department of Public Works of the city and county of San Francisco, from Engineering and Contracting and from revisions by Mr. L. W. Stockes, assistant to Mr. O'Shaughnessy.

POMPEII CRAFT PRODUCED FINE ADAMS TYPE

From a study of Pompeii, which was made by Robert Adam during a tour of Italy made in 1754, is due the revival of interest in classic design brought about by him and by his brother, James Adam. Unlike other furniture designers of the Georgian period, the brothers Adam were architects and decorators, not cabinet makers, and it was through their architectural developments that the interest was evolved which gave to them a very definite place in the development of furniture design in England.

In the furniture which they designed to fit their houses rococo, Dutch and Chinese elements were completely abandoned. The cabriole leg was superseded by the straight, tapering leg, and lighter construction became the rule.

Carving when used was in low relief, and was rich in inlay of tulipwood, satinwood and ebony. Carving and inlay were in classic details—the urn, the laurel wreath, the oval sunburst, the acanthus leaf arabesques, ribbon bands, festoons and garlands. Painted decoration was utilized by them.

PAGEANTRY AND ITS RELATION TO ARCHITECTURE

By HOWARD GREENLEY

Presented to the New York Alumni of the University of Pennsylvania.

I HAVE always maintained the existence of a practical relationship between Architecture and the art of the theater in which pageantry must be included. If, in the opinion of the cognoscenti the productions of the architect may be considerately referred to as architecture we can then hopefully assume on my hypothesis that the architect is qualified to effect an easy transition into the realm of the theater and to develop his contact with pageantry, and, I further maintain, to the infinite advantage of both.

We are, therefore, gentlemen, attempting to develop the theme of the relation of one great art to another equally great art. If the definition of unity can be applied as a term in the final resolution of all the arts, then the relationship is at least theoretically established. Perhaps to establish this relationship of Pageantry to Architecture by indirection, I might say that Pageantry is directly what Architecture ought to be and too frequently, alas, is not, the art of self expression. And this is one of the great dangers associated with the profession of architecture that so many fall into; its conception merely as a study of archæology translated into terms of expediency and with the harassing accompaniment of an eternal routine of difficulties to be resolved or of compromises to be anticipated.

I am consciously drawing the worst side of the picture so as to stimulate you to a revolt against a situation which some of you have experienced, and to prevent, if possible, others of you from experiencing by suggesting various alternatives of self expression as a remedy against discouragement.

For as Mæterlink says in one of his plays—I think it is "Aglavaine and Selysette": "By dint of concealing that which is best in you from others you will end by not recognizing it yourself."

Nothing that I know of contains a greater degree of truth than this observation and this is the theme which I want to discuss and develop as the remedy which I have referred to. You may wonder how I shall ultimately get away with it when I describe this remedy as being nothing more nor less than pageantry. Pageantry viewed in its broadest sense.

We have referred to pageantry as an art of self expression. Let us see if it be taken periodically in accordance with the capacity of the individual who accepts it as a remedy, whether it is practical in the sense of a mode of self expression. Will it furnish an outlet for that which is best in you; for all those stored up creative energies which are not only going to bring satisfaction and efficiency to you in your work but also a corresponding measure of joy and satisfaction within the larger circle of the community? Of course, what I have said is predicated on your inclination to do a day's work. There is little advantage to be gained in talking to anyone who doesn't regard it as a heaven sent opportunity or to the class who consider it vulgar. Let us proceed on the supposition that we do not belong to these classes and continue. It is a fact that all of you will average seven hours of leisure daily over and above office, meal and sleeping hours. Potentially there is a lot of energy going to waste in those seven hours if you do not use some of them creatively and constructively. For many of you, a part of the time is devoted to golf or riding or swimming, or dancing as the case may be—

excellent and essential activities to whatever extent indulged in, but superlatively valuable if you undertake them with mind and muscle consciously co-ordinated toward the attainment of perfect style and form and rhythmical action. Now put a little of this same effort and resultant style into your work and see what happens as a result. More quality, more speed and more time at your disposal.

What I am getting at is this; the greater and more varied your activities, the more you can do, and the more opportunity you will have to exercise your creative faculties along varied lines of self expression. Some of the spare time you have unscheduled you can use to advantage in discovering the latent talents and aspirations within yourselves and developing them. That they will be along lines of artistic endeavor is more than probable in view of the training and education you have been privileged to receive.

Art has been described as the quality of being able to express an emotion beautifully. Now if we get to the point of applying this principle to as many of our activities as we can we become after awhile able to inject beauty into our own lives and into the lives of others as well. We become all of us potential figures in the pageant of the world's progress. It makes no difference what we are doing, so long as we do it well and understandingly, for without that understanding, we are little better than slaves. Now all of this is preparatory to this subject of pageantry and its architectural relation. If art is the quality in the individual of being able to express an emotion beautifully, pageantry is nothing more, nor less, than a collective expression of the same thing. The word pageant comes from a late Latin word "pagina" meaning a stage, and pageantry is described as a spectacle, or a kind of continuous performance.

Since Shakespere has said that all the world's a stage, he had a fairly clear notion of pageantry.In the largest sense it is the theater of life, and the theater is an all comprehensive art. It has by assimiliating the inner rhythms of many arts into the service of a new structure created new beauty.

The applicability of the definition to architecture must be apparent to you, and further examination will develop additional conformity. The same elements enter into the structure of a stage production, or of a pageant as in an architectural construction. Both must proceed with a plan, call it a scenario or a program as you like; the plan must be derived from it.

You have the periods of history covered by the Pageant parallel in the historic style of your architectural design. The stage settings, embellishments, accessories and properties required in the presentation of a pageant, correspond to the decoration, the furnishings and other equipment of a building, and furthermore are all architectural in source of design. Again the composition of your pageant groups and the design and color of the costumes are all reflected in the composition, ornamentation and color treatment of your building.

But you may accept this and still say that after all, architecture is static as compared with the rhythmic movement and kaleidescopic color changes in your pageant. What then? Let me ask if you have observed what the life of the majority of buildings is in New York. Due to changing conditions of zoning, trade centers, occupancy or of many other demands one can say that twenty years is a fair average. Is there not something of a passing spectacle or a fleeting show about this com-

parable to pageantry? But let us disregard this impermanency and look at it from another angle. Is there nothing rhythmic about a tremendous colonnade in the orderly spacing and dimensions of its columns and the swing and sweep of its soaring mass. Have none of you observed the color changes in a building under various conditions of light or of darkness or of other atmospheric effects? Of course you have, but you may never have been impressed by its relation to pageantry. A magnificient building is not only the background of a pageant; in itself it represents the pageant of architecture. Look at it not merely as a mass of stone and steel, but visualize it as living and filled with color. Observe the dramatic dominance of its scale, and then you get within your imagination something of the relation between these two expressions of pageantry and architecture, and something of its emotional appeal.

And no other group of men in the world today is so singularly well equipped as you architects. You are trained in all of the things which the art of the theater in the larger sense of pageantry implies. You have the knowledge of design, of composition and of color. You are susceptible to qualify of rhythm whether expressed musically or in the orderly sequence of architectural plan and elevation. You bring to bear on the subject resourcefulness, ingenuity and a systematic procedure into the working out of a project from its inception to its completion and in my own experience, gentlemen, I have found this my most valuable asset as compared with others outside of our profession who are engaged in this kind of work. And last but most important, you have the knowledge of suitability and of taste and of scale and there is where you are triumphant.

Now I do not tell you to all go out and become masters of pageantry or of decoration, but I do say this; that if there is anything I have told you that makes an appeal to your imagination go to it. Put in some of your spare hours thinking about these things. Put some of them in practice on any scale you may select. It is not necessarily a question of dimension. Spread the information. Carry the torch. You have had the advantage of education that many others have not enjoyed. Watch them absorb it. No other factor in the lives of individuals is as psychologically profound.

Grace of mind and of body go together and the desire for better things. And I have the firm conviction that any community or group of individuals which has watched or participated in pageantry production must react in a very definite way to the appeal to its beauty and formulate a creative desire to make its own surroundings approach the ideals which have been set before it in the pageant.—Pencil Points.

A DESIRABLE COLOR SCHEME FOR HOSPITALS

In one of its recent issues The Modern Hospital, replying to the query of an architect, states that the most desirable color scheme for walls and ceilings in a hospital appears to be a cream or buff shade or light green. In localities where there are many dark or rainy days, the light buff or cream for walls and ceilings is the most generally used.

HOME OUR BEST SECURITY FOR CIVILIZATION

The English statesman, Disraeli, said:

"I have always felt that the best security for civilization is in the dwelling; and that upon properly appointed and becoming dwellings depends more than anything else the improvement of mankind."

SOME HINTS ON PAINT MIXING

By E. O. JOHNSON, National Lead Co.

A FEW weeks ago, while in one of lower Broadway's finest office buildings, some redecorating was going on in the big foyer and I stopped to chat with one of the men on the job.

As I stood there, my painter acquaintance removed the lid from a can of paint and started to stir.

"What are you doing?" I asked in amazement. "Can you mix up that paint that way?"

"Why, that's the way I always do," was the indifferent reply.

A week later, when I talked with the superintendent of the building, he pointed out to me the shiny spots here and there on that wall and I told him how the paint had been stirred up. The superintendent knew a good deal about painting himself and I didn't have to tell him that the oil should have been poured off and mixed a little at a time into the paint which had settled; "boxing" the paint from one receptacle to the other and using every precaution to get a uniform and homogeneous mixture of paint and oil.

SHOULD HAVE BEEN THINNED

Not long after the incident just related, I stood watching a workman mixing paint for the window sashes of the new Cunard building a little further down the street. He had some light green paint and he had to match it to a darker green. He took a can of paste lampblack and dumped it in and began to stir. He pulled his paddle out of the paint and looked at it. The paint on it didn't show much change, so in went some more lampblack. Still the same result. The painter didn't stop to think that the black was lighter in weight than the green and so stayed at the top of the mixture, adding little depth to the tone—also probably in comparatively large particles.

Straining the paint would probably have mixed the color in, but it would have left it a different shade than the painter figured on. If he had thinned his color with some turps before putting it on the paints, the black would have mixed in and straining it would not have changed the shade from that desired.

Now these two instances may seem surprising, because painters are supposed to know how to mix paint as well as apply it. Some of them do. Some of them, however, do not even know how to properly stir up a prepared paint. I think that if I were a building superintendent or a boss painter, I'd give every painter in my employ a little course of lessons to be sure he understood the fundamentals.

TRICKS TO ALL TRADES

There are "tricks of the trade" for mixed paint and others for thinning paste to painting consistency.

Keg white-lead is a fairly heavy paste and the first thing that must be done therefore is to thin it with more of the pure linseed oil which has already been used to transform it from a powder to a paste.

Let us suppose that we have a hundred pounds of white-lead and we want to add to it two gallons of oil and two gallons of turpentine. If we should mix the oil and turpentine and then put the entire hundred pounds of paste in and try to stir it up in that quantity we would find that the paste would probably remain in lumps; stir as we would, it would not mix properly with the liquid.

Consequently, as every painter knows, we first pour into a receptacle a very little of the oil and then put in the paste white-lead. With a

strong wooden paddle stir and mix, thus working the paste lead and the oil together. A small quantity of oil added in this way softens the paste somewhat and when it has been thoroughly mixed and made uniform throughout we add a little more oil and stir again. We keep on adding oil a little at a time until the paste is sufficiently fluid to be easily stirred, but still is like a thin paste similar to colors in oil and not thin like a paint ready for application.

COLOR TINTS

If any tinting color is to be added, thin the tinting color to about the same consistency as the semi-paste described above by adding oil or turpentine as required and adding to the white-lead a little at a time, stirring each application in thoroughly. Different makes of colors differ in tinting strength, and if we were to add all the color at one tme we might get our mixture too deep. It is far better to add a little at a time, bringing it up to the color gradually. If this is done a perfect match is not difficult. A good scheme is to dip out from the white mass a small quantity before adding the colors to be used to lighten the tint in case to much color has been added. This will save making too much paint.

ADDING DRIER

A favored practice is to add the drier next. As it is very essential that this be well mixed through the paste, the method used should be as in the case of the oil and colors—that is, a little at a time, each lot being well stirred in. After the drier has been added then add the turpentine by the same methods as already described. Bear in mind that drier acts only on oil and should be proportioned to the oil—not to the total volume of the paint, nor even to the volume of the oil and turpentine.

To test the color spread a drop of the mixture on a piece of clean glass, turn the glass over and look at the paint through the glass. The side of the paint film that is in contact with the glass will be perfectly smooth and may therefore be easily compared with another batch of paint by spreading a drop of the second batch alongside the sample from the first lot. The slightest difference between the two will be shown up by this method.

Paint is always improved by being allowed to stand a day before using. It should always be strained through a cheese cloth or a fine sieve shortly before it is needed for the job. This process eliminates the paint skins as well as any paint lumps or dirt that may have gotten into the mixture, and it also adds the final touch to a perfect job of mixing.

A good painter will follow these methods as a matter of habit. Good mixing is the foundation of any good paint job. Good work is impossible without good mixing. Keep in mind that turpentine is a thinner and evaporates—and that one quart of it in a batch of paint will thin the mixture about as much as two quarts of oil.

TURPENTINE HAS TWO USES

Turpentine in paint has two uses. First, it penetrates the pores of the wood or plaster much better than does the linseed oil and thus enables more of the pigment to be carried into the pores of the surface. That is why some turpentine is nearly always used in priming coats. Second, it is frequently desirable to have more pigment in a paint film than would be obtained in a workable mixture in which the only vehicle was the linseed oil. Turpentine serves as a very handy agent in this case because after the paint has been applied the turpentine evaporates out and leaves on the wall the desired proportion of pigment and oil.

THE SKYSCRAPER

By F. W. FITZPATRICK
Consulting Architect.

THE earliest aspiration heavenward for building in this country was in the mind of the real estate man who a couple of generations ago awoke to the great fact that a one story building had to pay all the ground rent or cost and that each additional story reduced that ground rent or cost just so much. Hungry for profits he naturally wanted to build upward rather than spread out upon the ground.

Of course, in ages far back they built a few things pretty well up in the air, monuments, pyramids, towers and what not, but for sentimental or monumental not economic reasons and most of them, reasons and towers, led but to confusion.

But to get back to the skyscraper—the American institution. Engineers and architects could not satisfy those early real estate cravings for height. The only way to build was with masonry walls and every story superposed required just that much greater thickness, so that a very tall building would mean pretty much all the ground space taken up with brick and stone and just a bit of a hole inside for use! The pyramids are such great masses surrounding a tomb.

Then came the elevator, which was the real creator of the skyscraper, a means of traveling upward, but no place to go. The machine was perfected and it was figured it could travel to a considerable height without necessarily breaking cables. That was quite a feat. That breaking business was no theory either. In 1881 I had the pleasure of coming down six stories in a run-away elevator (not a particularly pleasant sensation).

Well, the demand, the need, the hope for a tall building scheme existed and there was the elevator at hand, the means of making the topmost story as accessible as the ground floor. And no doubt many engineers and others dreamed dreams and perhaps talked about it, but you will find nothing printed nor any record of actual plans being made until 1883.

Early in 1884 I had the temerity—still being young and foolish— to publish the results of a lot of study and figuring and experimenting a Swedish engineer named Strom and I had been doing until we were finally convinced we could go up 25 stories. A scheme of cast iron columns and iron beams forming the skeleton frame of the building and each story's outer wall, nothing but a shell or curtain wall to keep out the weather, supported on each story's beams, bracketed out on the outer columns. There was a glorious anvil-chorus: we were crazy, we were dangerous young lunatics, no one with any sense would listen to us. But I was sure of the scheme and of Strom's figures. As a mathematician I have never known his superior. Three things he could do well—a huge man with a fist on him like a sledge hammer. He could everlastingly figure, he could and did fight for his convictions—woe to him who said we were crazy in Strom's hearing—and he could consume more red-eye than any human being I have ever known.

We were in Minneapolis, in a leading architect's office, and we persuaded the latter and the Tribune folks to build, as we planned, a 16-story structure. All was well until the foundations were started and then the owners and the architect got cold feet. They used the scheme but went up only eight stories. The architect later on got some sort of patent, (his ethics were peculiar), and finally sued tall building owners right and left, but was eventually squelched. Meantime Colonel Janney

of Chicago, in 1885, had gotten the steel people to roll certain forms of steel beams and he actually put up a 12-story structure, the first bona fide skyscraper of which we have record. Then came the Masonic Temple in Chicago and hundreds of other buildings in New York and other big cities. The progress of the Art from that point on was rapid, refinement of parts, exectitude of details and endless improvements, but the old column and beam frame still remains the basic, fundamental form of construction, and its has become so sanctioned by usage that we may be justified in averring that the kids of '83 were on the right track anyway.

Today people think nothing of thirty and forty storied building. How quickly we grow accustomed to things that were deemed wonderful. Think of it, '83 is only forty years back. Why, as late as 1902, only twenty years ago, we were building the first tall building in Canada—the Security Bank in Montreal. As usual the terra cotta for the upper stories was completed before that for the first story—an intelligent habit building supply people have. So to save time I ordered the seventh story walls to be built first, each story, of course, being self supporting as to masonry. The building department looked cross-eyed at us, people in adjoining buildings protested, the police forbade us to go on in so dangerous a manner and finally the city enjoined us. The owners, however, backed us up, we gave bond and went on, but the police barricaded the street at the block and diverted traffic while a crow was always gaping—at a safe distance—waiting to see the whole contraption fall down, hoping undoubtedly to witness the mangled remains of the fool architect carried down with the debris.

There is an attraction about building up and a temptation, additional rents. One will walk up to a third story but object strenuously to four, so, presto, in a four story building one must have an elevator. But it seems too bad to be forced to put in an elevator for the one additional story. It will serve a seven storied building at but little added cost. So with the heating and other mechanical plants, the difference between what is needed for four stories and seven is trifling, likewise the upkeep, janitor and so on. There is no comparison between the cost of original installation for four and the extra for the upper three, so that a seven storied building is infinitely more profitable than a four, paying a far greater proportionate return on the additional investment. But after seven stories, more elevators are needed, more boiler, more janitor equipment, but if that is installed one might just as well go up to eleven, then fifteen, then seventeen, then twenty.

At twenty you get into a new order of things, almost a distinct class. You are beginning to wrestle with wind pressure, vibration, counterbalancing of elevators, all that sort of thing. Only in the larger cities, especially where some geographical or other barrier reduces the business section to a small area is one justified in going above that.

I have had much to do with the writing of building laws in our cities and though more or less of a crank on tall buildings I have always sought to keep the limit down to 20 except in a handful of our cities.

In Chicago there is a great temptation to run the "loop" buildings up, but it is only a sentiment, one that has gotten us into a fix with our transportation and such details, for we have unnecessarily croweded everything into the loop. Lately however, we notice a healthy tendency to spread the business district out beyond the loop.

It is in New York that the real demand exists for skyscrapers. In

Chicago we can grow in three directions; in New York but one. So the tendency is to put everything on that narrow strip "down town." Naturally, if you cannot spread laterally you try to go up or down. We do go down five and six stories in New York, easy enough, but there are difficulties on account of light, air, etc., so, perforce, we go up. There is a reasonable limit there too, in the thirty stories. The super skyscrapers, The Woolworth, for instance, a very beautiful tower, add some attraction to the sky-line, but are chiefly advertisement, so is the Wrigley tower of Chicago. When you climb to such great heights you are geting into complicated construction and so costly that the return in rental on those upper stories doesn't justify the expenditure.

Chicago has a limit of height generally to one and a half times the width of the street in front and nothing beyony 260 feet at that. There is an itch in European cities to break out and climb on upward, but so far the conservative element has been strong enough to fix the laws permitting eight and ten stories at most. But I expect London to break out of bonds within the next four years. Paris may come later. She is objecting officially just now; things American are in bad odor there—skyscrapers, American treaties, finance and all. In Berlin they have "projected" a skyscraper already, talking about putting it up near the Bourse or Stock Exchange. It is to be an American skyscraper all of thirteen or fourteen stories. But instead of having an American do it they have invited Berlin architects to compete. Heaven forgive them for calling the result reminiscent of American architecture. It is awful. German pre-war architecture was distressing, but this post-war effort is appalling.

New York has built upward so much that she has made her narrow streets veritable chasms, dark trenches. This is all wrong. It is harmful, affects the health and spirits of people, unhygienic, unjust to the citizens and complicates the traffic.

Some skyscrapers, for example, cast a shadow covering nearly eight acres. The Adams Express building, New York, which is 424 feet high, casts a shadow 875 feet in length; the Equitable building, which is 493 feet high, casts a shadow 1,018 feet in length; the Singer Tower, which is 540 feet high, casts a shadow 1,127 feet in length, and the Woolworth Tower, which is 791 feet high, casts a shadow 1,635 feet in length.

Some skyscrapers cast shadows from a sixth to a third of a mile in length, on surrounding property. Thus the Equitable building's shadow at noon on December 21st, is about one fifth of a mile in length; it completely envelopes an area of 7.59 acres. In some cases not a single window within 447 feet of the street level would receive a ray of direct sunshine.

Twenty years ago it was manifest that the tendency to go upward would result in just such a condition in time, but frankly I didn't think it would be for forty or fifty years, but began agitating in the engineering press a plan to permit one's going up as high as he wanted but doing it sanely and without injustice to neighbors, the streets and his own tenants. A simple enough plan, just stepping the building back from the streets at certain heights, making your tall buildings pyramidal so that the surrounding streets on each block would have light, sunshine, and abundance of air.

Engineers, architects, most everyone it seemed, took a fling at the idiotic notion, calling it wasteful of space, costly, ugly, etc., etc. But

a few converts were made and we kept everlastingly pounding, newspapers, propaganda, laboring with the city officers, the banks and other loan agents—and these were first to realize the general improvement to property it would be—and finally two years ago New York passed the desired regulation and all tall buildings since then conform to that stepping back notion, some mighty fine buildings too, such as the Cunard of twenty-five stories, Ambassador Hotel, Standard Oil, Hide & Leather and similar structures.

Just now certain architects and engineers are vieing with each other to see who will do the loudest shouting for the stepped-back building. They grow quite enthusiastic about it. Just a few days ago I noticed an effusion in a New York magazine, says the author:

"When the United States supports the 500,000,000 inhabitants predicted by statisticians, and our cities have become more vast and crowded than they are now, it will be more necessary than ever to build skyscrapers so that light and air can reach office-workers and people in the streets below.

"Already laws passed in some cities require that the upper stories of all such buildings shall have "set-backs" at an angle determined by each particular section of a city. This angle is found by drawing an imaginary line from the center of the street to the height allowed the first "terrace" in that building zone. All other stories added to the structure must not extend beyond that line. Suppose for instance, that the street is one hundred feet in width, the building laws require that no shall be higher than the street is wide, unless the front is terraced. Then the diagonal line of an imaginary triangle constructed with a base of fifty feet and a vertical leg of one hundred feet, would dictate the slope of the pyramidal front.

"It will be seen, therefore, that in cities having many high buildings, the latter will mount step by step, always receding from the street. These aerial terraces will suggest the construction of roof-gardens, tennis-courts in the clouds, open-air theaters, Greek temples in the sky, and green terraces encircling apartment houses. New York, Chicago, San Francisco, and other great cities will look like Babylon with its hanging gardens.

"Architects are now picturing the probability of each city block being taken up with an enormous pyramid of marble, granite, or terra cotta. In the immense buttresses at the corners, defining the lines of the edifice, would run escalators that would take the place of the usual elevators.

"These radical changes are not so far-fetched as they may at first seem. Equally as phonomenal architectural changes have come in the past twenty years. Scarcely a well-known building standing in New York today was here twenty years ago. Even modern skyscrapers are sacrificed to the movement of business, and a significant thing about twentieth century architecture in this country is that it is not meant to be permanent. "I believe that American cities will gain in architectural harmony and our business districts will be far more restful to the eye and nerves as a result of the uniform height of the terraced structures that I predict, will become familiar in every metropolis."

How high can we go? Well, that's something interesting for our younger engineers to figure out and dream about. I may not be as ventures as I was forty years ago, but here, one of the last years I

was in the Government Service at Washington, my chief assistant Lepper, (an engineer of splendid calibre, who has done wonders in shipbuilding as well as terrestrial construction) and I were off on a bit of a vacation. It rained most of the time so we played chess and figured up wind strain, torsion, foundations and what not along a certain line of progression and assuming certain what might be called standard conditions of subsoil and all that. And we got a building up to 4000 feet, 400 stories about, on a base the size of an ordinary city block 384 feet square, the base which would be a rock foundation.

But if it were in a land of earthquakes I'd want to be far, far away from that town, when the shaking began. I put the result of our profound cogitations into an article that was published first in the Popular Science Monthly of December, 1917, and several other journals since, much to the amusement and perhaps disgust of the same old conservative element in our honored profession that formed the anvil-chorus in the early '80's.

SOME NOTES ON INTERIOR DECORATION

By BERNARD C. JAKWAY

Extension Lecturer on Interior Decoration, University of California

TWENTY years ago the term Interior Decoration, newly arrived from France and not yet naturalized, was to most Americans vague and meaningless, while an interior decorator was a man who hung wall papers or painted ceilings and friezes in a manner heavily Teutonic. Today both terms are commonly employed and everywhere understood, the one as comprehending the sum of all the processes by which a house is made comfortable and beautiful to live in; the other as designating an individual equipped by training and experience to initiate and carry out those processes.

One may not like these terms—indeed, I heartily dislike them both —but they are here; and they would not be here had not the ideas for which they stand become within the last two decades tremendously important in American life.

It may be doubted whether any peaceful revolution has ever come about so quickly as the revolutionary change in the general attitude of our people toward their homes and toward the home-making processes. The reasons for this change need not concern us here. The fact is enough. And the fact is that we have all come to desire a greater measure of comfort, beauty and comeliness in our homes. In short, we all want better homes.

It is clear that better homes demand better sites, better planning, better construction, and a better equipment of those mechanical, labor savers which now add so greatly to our comfort and convenience. These factors are, however, of immediate concern only to those who are about to build new homes. For most of us better homes mean better-furnished homes, and these in turn mean homes in which the furnishings have been so chosen and arranged as better to meet our needs, satisfy our tastes and aspirations, and fit our purses. Interior decoration is a real creative art, but it is in a peculiar sense an art of selection and arrangement. We can make our homes better only by means of such things as we can find in the shops and can afford to pay for.

Here we arrive at the great illusion of the layman, and the great stumbling block in the way of better homes. The housewife thinks in

terms of individual decorative units, rather than in terms of the completed room as a unit. If she has a living room to furnish she thinks of the rug, the sofa, the chairs, lamps, tables and so on that she desires to use in it. When she goes to the stores to look for these things she finds that those individual pieces which seem particularly beautiful are also particularly costly. Quite naturally, she concludes that if she can afford to purchase these costly pieces her room will be beautiful, and that if she cannot afford to purchase them, but must content herself with cheaper things individually far less attractive, beauty will be beyond attainment.

These conclusions are, however, wholly false. It is, of course, a pleasant thing to be surrounded by elaborate and costly furnishings, provided that such furnishings fit one's house and accurately reflect one's way of living; but it is no less a pleasant thing to be surrounded by simple and inexpensive furnishings. So far as beauty, comfort and distinction are concerned, it does not matter whether the things we use are costly or cheap, or in what shop we buy them. All that really matters is the taste and artistic judgment with which these things, whatever their price, are chosen, combined, and arranged in a complete and perfect whole. Twenty Carusoes, singing different scores ,would make an intolerable racket; but an artist can get music out of an accordion.

There is another great illusion, and a second stumbling block in the way of better homes. This is the idea that interior decoration is a sort of black art, or at any rate an art demanding faculties possessed by few, and employing processes esoteric and beyond rational explanation. It is true that work of the very highest order demands, here as in the other arts, that power of imagination and of vast artistic synthesis to which we give the name of genius, and that the ways of genius must remain forever hidden to the common man. But it is also true that interior decoration, apart from its masterpieces, is a matter of rational and essentially simple processes, based upon clearly established principles and definable general ideas. We can all learn these principles, and we can all go far toward mastering the processes based upon them. Once we have done so the question of a full or lean purse will cease to trouble us. We shall go to the shops that we desire to patronize, ask for the necessary guidance in technical matters, and then select, assuredly and with no fear of costly disappointment, such things as meet our needs and suit our tastes, and, properly combined, invest our rooms with comfort and with beauty. Here lies the way to better homes.

COMBINATION CHURCH AND MODERN HOTEL

A COMBINATION church and seventeen-story modern hotel is to be New York's latest novelty in buildings. The structure, providing Sunday-school space in the basement, a church in the first three floors and a missionary school on the roof, will be erected on the site of the Metropolitan tabernacle, Broadway and 104th street.

A strict censorship will be exercised over hotel guests and card playing and dancing will be prohibited. The estimated cost is $1,500,000.

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Weakest Point of Modern Office Building

The recent big fire in the business section of Chicago demonstrated, according to engineers, that the window is the weakest point of the modern office building and that to retard the spread of fire in a structure of this class precautionary measures must be taken more efficient than heretofore. It appears that on two sides of the sixteen story Chicago, Burlington and Quincy Railroad building, steel sash and wire glass were used on the windows while the street sides had wooden sash and plate glass except in front of the fire escapes. This alone was enough to condemn the building as a fire proof structure. No matter how fire resisting the floors or partitions, if windows and doors are left unprotected it is an easy matter for the flames to jump from one story to another which was apparently the case in the Chicago, Burlington & Quincy building.

According to investigators the fire seemed to leap from window to window. The Burlington building was not equipped with an automatic sprinkler system and experts maintain that sprinklers would have done much to save the contents of the upper floors. From the eighth floor up there was almost unbelievable destruction by fire, and this in a so-called "fire-proof" building constructed at a cost of $1,500,000!

Asking Bids from the Architect

The trustees of the Siskiyou Union High school district recently called for competitive bids from "pursuant to the provision of Article 1612 of the Political Code of the State of California." There may be some excuse for this isolated mountain community following an obsolete practice entirely out of keeping with modern business and professional ideas, but what of a progressive metropolitan community, like the city of Los Angeles, that does it?

Most architects are emphatically opposed to this sort of thing and it is a pity they are not all of the same opinion, thereby making it impossible for a public board to obtain competent architectural advise except through the recognized legitimate channels. The architect should not be placed in the same class as the contractor who secures his work through competitive bidding. Architects should be paid for services rendered just as other professional men are paid and he should not be asked to cut his fees.

Notes and Comments

Newspapers and Their Indifferent Attitude Towards the Architect

The American Contractor.

Newspapers, as a rule, have been slow to realize the possibilities in the construction industry as an advertising field. Perhaps the various elements in the construction industry are as much to blame for this as are the newspapers. Looking at it from the counting room, the building and construction activities of a modern city offer a greater source of advertising revenue than does the automobile industry. Almost every metropolitan newspaper donates columns of its space to automobile news. Most of this material has no news value. Much of it is foam and froth of the trade puff variety, yet because the automobile industry has the advertising habit also every newspaper in the country gives it free publicity without applying the rules of news to the material published.

Building and construction is more intimately connected with general prosperity and the welfare of the nation than is the automobile industry. A comparatively few papers open their columns to the real news of the building business on anything like the scale with which the automobile industry is favored. Perhaps the most conspicuous example of a newspaper that has come to realize the importance of the building field is the Philadelphia North American. It has been publishing for some time a Construction and Engineering Department, edited by J. A. Githens. Its exhibit during the conference of the National Federation of Construction Industries, in Chicago, was one of the most interesting displays on the convention floor. It was decidely valuable advertising for Philadelphia and equally valuable for the construction interest of the east.

Architects feel that it is not ethical to pay for advertising. Architects do not object to free advertising. As a rule they rather like it. Engineers, pretty much, share this attitude. The contractor, material dealer, the real estate man and the manufacturer recognizes that his activities are straight business activities and advertising is an important adjunct to every modern business. More advertising in local newspapers is bound to stimulate the interest of that paper in the news developments in the building field; it is bound to open the way for publicity on the fundamental facts and conditions in the building business. That is most desirable.

Many city papers confine their news reports to the real estate field and handle building news from the realtors' point of view. It seems that the public viewpoint ought to be maintained by the newspapers and the various elements in the building field ought to encourage the newspaper that maintains that point of view.

Los Angeles Troubled With Irresponsible Contractors

Southwest Builder and Contractor.

Complaints of those who have been defrauded by irresponsible persons posing as building contractors are still common, despite the warnings issued to the public by the district attorney's office some time ago. These complaints not only cover losses sustained by owners by reason of self-styled "contractors" abandoning jobs with bills unpaid after receiving one or two payments, but also shoddy and careless construction.

Irresponsible persons who pose as building contractors are usually shrewd enough to keep within the law in fleecing the innocent and unsuspecting, and hence cannot be prosecuted. Under the law a "contractor" who pockets the payments received on a job and abandons it is guilty only of a breach of trust, and the person defrauded has no recourse except in the civil courts. A judgment may be secured and recorded, but this avails nothing if it cannot be satisfied; and these irresponsibles are careful not to have any tangible assets that can be attached. However, each case must rest on its own merits, and persons who have been defrauded should not hesitate to tell their stories to the district attorney's office. The cleverest rogue will sometimes slip, and the district attorney will gladly prosecute if grounds can be la for it.

While the building industry may rightly disclaim responsibility for the "fly-by-night" contractor, it must suffer from the odium of his operations. Responsible builders cannot prevent unscrupulous persons trading on the good name of their business; nor can they alone suppress the "fly-by-night" contractor, but if all branches of the building industry co-operate they can make it so uncomfortable for him that he will not get very far in his operations. It may be contended that it is the owner's place to see that he lets his work to a responsible contractor; but, admitting that may be so, it is not a sufficient reason for the building industry failing to take cognizance of the fact that owners are imposed upon in the name of the contracting business.

A British View of American Architecture

Editorial in Concrete and Constructional Engineering, London.

Whether it was coincidence or fore-

thought—we suspect a combination of the two—that synchronized the exhibition of American architecture at the Royal Institute of British Architects with the disarmament conference at Washington, the incident affords a happy augury for future relationships between the great countries; a fact that Lady Astor, M. P., was quick to realize when, in the course of performing the opening ceremony, she said, "I think America and England should remember that it is taste that unites countries, not treaties." There is a very close parallel between the relationship of the American to the Englishman, and of American architecture to English architecture. It is no rare event for Americans of more thoughtful disposition to experience, on arriving in England for the first time, a strange feeling of kinship; the visit assumes the aspect of a familiar return rather than a new adventure. So, too, the American architect is at once aware that he is amongst the prototypes of his own great national architecture, for the French influence that is now so marked in American architecture is a comparatively modern growth and dates from the World's Fair of 1893, from which date the great name of McKim emerges, and from thence onwards the influence of the Beaux Arts tradition becomes more prominent. America has assimilated the best from Europe, and, the intervention of the Atlantic giving just that distance of vision necessary for freedom from sentiment, has boldly and splendidly converted it to her own ends. Thus it is that we find in some of the smaller works of domestic architecture a delightful harmony between French and English elements that would be impossible in either of the countries of origin. The transplantation of Gothic, however, does not seem to have met with such success. The reason may be that the beauty of Gothic is so largely the result of its very definite structural limitations, and in its history the gradual surmounting of these limitations is to be traced. Today they have been entirely transcended, owing to the development of new materials, so that to build a Gothic structure, retaining these limitations, becomes an anachronism, to build and to ignore them is a sham.

The Englishman, visiting the exhibition, must have been impressed by the greatness of conception, by the scope, and by the opportunity; for architects are limited by the attitude of their age towards architecture. There is, it is true, a certain interaction; opportunities make architects, and architects make opportunities, nevertheless, it must not be overlooked that in America the commercial asset of a fine building is understood; moreover, there exists among the people what may be termed an architectural consciousness which is gradually being created in England, but the process is slow and laborious, and until it is effected we shall continue to have meanness and ugliness in our midst. Meanwhile, we look with envy and admiration at American work, we are astounded at its scale and its prodigality and at that elusive quality which applies equally to architecture as to mankind, and which, in the latter connection, is referred to as good form. An aspect of this quality is revealed in the extreme refinement of detail. Particularly is this noticeable in domestic work. Care is expended on such details as the exact texture of brickwork and in its pointing, in the moulding of the smallest architrave, and the graining of a door. Everything assumes a proper degree of importance and receives a proper degree of attention. It must not be assumed that the English and the French are the only European influences to be found in American work, often the inspiration can be traced direct to the source of the Italian Renaissance or, as in the Pennsylvania Railroad Station at New York, one of the greatest achievements of McKim, Mead & White, to Imperial Rome, and here and there Spanish elements are to be observed. The rich diversity of treatment is largely the result of climatic conditions which vary immensely in different parts of the country. It is difficult to appreciate the significance of this influence, accustomed as we are to our own so very limited variations, and viewing work gathered together from all quarters of half a vast continent within the confines of a small gallery.

Yet over all there is a spirit of modernity. The European elements are made to live again because they are synthesized into something new, virile and expressive of a great architecture-loving people. And this boldness of attack is not limited to the designs, but extends also to the handling of materials. No prejudices are allowed to stand in the way of the use of a material if its efficiency be proved. Architecture is, after all, subservient to humanity, and must therefore be subjected to a never-ceasing change. It cannot live in the past and serve the present. Thus we find that the American architect is quick to realize the possibilities of concrete as a material for every class of building, and quick to discover and exploit its aesthetic possibilities. Assuredly we have lessons to learn from America, and we shall be helped in our instruction by exhibitions such as the one recently displayed upon the walls of the Royal Institute of British Architects.—Engineering and Contracting.

With the Architects

Building Reports and Personal Mention of Interest to the Profession

Scottish Rite Cathedral

Messrs. Weeks and Day, architects in the California Commercial Union building, San Francisco, have been commissioned to prepare plans for the new Scottish Rite Cathedral to be built in San Francisco for the California Body, at an estimated cost of $900,000. Messrs. Weeks and Day have also been appointed architects for the new $500,000 market building to be erected on the block bounded by Market, Eighth and Mission streets, San Francisco. It will be the largest market building west of Chicago.

Salvation Army Building

A contract has been let by Architect Norman R. Coulter of San Francisco, to Vukicevich & Bagge, 180 Jessie street, San Francisco, to construct a nine-story reinforced concrete building for the Salvation Army on McAllister street, adjoining the Hibernia bank, for approximately $250,000. The same contractors have been awarded a contract to build a one-story Class "C" store building and undertaking establishment on California street, east of Polk, San Francisco, for Mr. B. Getz, from plans by Architects Morrow & Garren.

Oakland Physicians' Building

Plans are being completed by Architect Willis Lowe, Monadnock building, San Francisco, for a nine-story reinforced concrete physician's building for Dr. Robert Dunn and associates, at the corner of 19th and Franklin streets, Oakland. Ground will be broken June 1st and construction will be in charge of Mr. P. A. Palmer. Mr. Lowe is also making plans for a $10,000 home for himself in Lakeshore Highlands.

$100,000 Apartment House

Architect Albert Farr, San Francisco, is preparing plans for an apartment house, 123x127, to be built on Jackson street, between Broderick and Divisadero streets, San Francisco, for Mrs. James W. Ward of 2821 Jackson street.

Theatre Alterations

Extensive alterations are to be made this summer to the Portola theatre, San Francisco, and the plans are now in the hands of Architect Alfred Henry Jacobs, 110 Sutter street.

Apartments and Hotel

Architect Louis Mastropasqua, 580 Washington street, San Francisco, has completed plans for five residence apartments for Mrs. L. Liati on Larkin street, south of Greenwich, San Francisco. The estimated cost of the improvements is $40,000. Mr. Mastropasqua is also preparing drawings for a three-story brick hotel of forty rooms to be built in Pittsburg, Contra Costa county, for S. Garusa & Bros.

Architect to Build Apartments

A three-story and basement concrete, frame and stucco apartment house is to be built at once on the north side of Sacramento street, between Franklin and Gough streets, San Francisco, for Mr. Milton Latham, San Francisco architect, from his own plans. The building which is to cost $50,000 will contain six residence apartments of six rooms each, two baths, servant's quarters and garage accommodations.

Designing Costly Homes

Three large residences varying in cost from $25,000 to $45,000 are being designed by Architect Louis M. Upton, 454 Montgomery street, San Francisco. One of these houses is for Margaret E. Wilson, whose home will occupy a marine-view lot on Lake street, San Francisco. A second house will be in Burlingame, and a third in Alameda county.

Richmond Architect Busy

New work in the office of Architect James T. Narbett, 910 MacDonald avenue, Richmond, includes a $35,000 addition to the Brentwood Grammar school, a memorial hall for the town of Brentwood, a memorial building costing $100,000 for the city of Richmond, and a bank building at Calistoga, Napa county, for the Bank of Calistoga.

San Jose Architect Busy

New work in the office of Chas. S. McKenzie, Bank of San Jose building, San Jose, includes a reinforced concrete store building at Mountain View to cost $20,000; an addition to the Cupertino Grammer school: and residences, varying in cost from $8,000 to $15,000 for Messrs. Frank King, Dr. A. McMillan and Herbert Jones.

Architect W. H. Weeks Busy

New work in the office of Architect William H. Weeks, 369 Pine street, San Francisco, includes completion of working drawings for an addition to the Orland High school, costing $60,000; addition to the First National Bank building, Exeter; shop building for the Willows High school; two-story brick high school building at Turlock to cost $175,000; a $50,000 addition to the Los Altos Grammer school; a two-story reinforced concrete high school building at Napa, to cost $300,000; a one-story reinforced concrete garage at Gilroy, for Mrs. Annabelle Ellis; a $20,000 auditorium for the Fruitvale Christian church; and a $12,000 addition to the Grace Methodist Episcopal church at Palo Alto. Architect Robert H. Orr of Los Angeles is associated with Mr. Weeks on the two last-named buildings.

Designs Many Buildings

Architect S. Heiman, 57 Post street, San Francisco, has recently completed plans for a number of new buildings to be erected in San Francisco, Oakland and Los Angeles, including a six-story department store for Dunn-Williams & Company, Los Angeles, to cost $550,000; a three-story apartment house on Scott street, north of Hayes, San Francisco, for Mr. H. Cohen, to cost $30 000; a one-story machine shop for Mr. Louis R. Lurie on Folsom street, San Francisco and a one-story brick store building for Mr. Emil E. Kahn on San Pablo avenue, Oakland.

Prof. Gregg Going Abroad

Professor John William Gregg, landscape architect and head of that division in the University of California, has just been granted sabbatical leave and will spend the year in travel through Europe for the purpose of studying old and new examples of landscape architecture, city and town planning.

Professor Gregg is a member of the American Society of Landscape Architects, and besides being on the Faculty of the University of California is landscape architect for the California State land Settlement board and the designer of the two model agricultural towns at Delhi and Ballico, California.

Stanford University Buildings

Plans are being completed by Architects Bakewell & Brown of San Francisco for a reinforced concrete dormitory with accommodations for 120 students and a dining room of the same type of construction at Stanford University. the two to cost in the neighborhood of $500,000.

Will Travel Abroad

Architect John P. Krempel and Mr. Carl Leonardt, president of the Southwestern Portland Cement Co., Los Angeles, have departed for an extended European tour. They will tour through England, France, Italy, Switzerland, Belgium, Germany and possibly other countries. They expect to return to Los Angeles in November.

Architects Move

Architect Elwin P. Norberg formerly of 6034 Hollywood boulevard, will move his offices immediately to 704 Union Bank building, Eighth and Hill streets, Los Angeles. In the new location, Mr. Norberg will have as his associate Charles E. Norberg, his father, who will move his office from Pasadena.

Opens Los Angeles Office

Mr. Joseph L. Roberts, one of the oldest practicing architects in California, has established an office at 702 South Spring street, Los Angeles. Mr. Roberts was formerly located in San Francisco and began the practice of architecture in that city in 1877. Mr. A. H. deWaard, formerly engineer for Wurster Construction Co., is associated with Mr. Roberts.

Personal

Mr. W. S. Hebbard, architect, formerly of San Diego, announces that he has resumed the practice of architecture after an absence of several years spent as assistant superintendent engineer U. S. Army Transport service and has opened offices at 664-5 I. W. Hellman building, Los Angeles.

Mr. William H. Wheeler will be associated with Mr. Hebbard.

Santa Rosa Elks Building

Messrs. Will D. and Frank Shea, San Francisco architects, have been commissioned to prepare plans for a three-story reinforced concrete lodge and office building for the Santa Rosa Lodge of Elks. About $200,000 will be expended on the improvements.

Vallejo Lodge Building

Architect Chas. E. Perry of Vallejo, has been commissioned to prepare plans for a three-story store and lodge building for Somoset Tribe, No. 22, Order of Redmen. The estimated cost is $60,000.

Architectural Examination

Examinations for architectural designer, grade V, salary $285 to $350 a month, and grade IV, salary $235 to $280 a month, to be held at Los Angeles and San Francisco, May 27, are announced by the California State civil service commission.

Branch Bank Buildings

The American National Bank of San Francisco and Oakland, will build three branch bank buildings in Alameda county, one on Fruitvale avenue, Diamond; one on East 14th street, and one in Piedmont near the Key Route station. The plans for these buildings are being prepared by Architect Edward T. Foulkes, Crocker building, San Francisco.

Bank and Office Building

Contracts have been let for the construction of a twelve-story class "A" bank and office building at Broadway and American avenue, Long Beach, for Mr. Edward John. Building will cost $850,000. Mr. W. Horace Austin is the architect.

Reedley High School

Plans are being completed by Architect Norman F. Marsh, Broadway Central Bank building, Los Angeles, for a group of high school buildings at Reedley, to cost $450,000.

Stockton Architect Busy

New work in the office of Architect Ralph P. Morrell, 41 South Sutter street, Stockton, includes a three-story frame apartment house for Julia O. Zerweck to cost $38,000; a frame residence for Dr. Nelson Katz to cost $9000; ward building at the county hospital to cost $85,000; an $18,000 residence for Mr. Thomas E. Connelly and a $15,000 house for Mr. Samuel Zimmermann.

Gas and Electric Building

Architects Bakewell & Brown of San Francisco, have been commissioned to prepare plans for the new office building of the Pacific Gas & Electric Company at Market and Beale streets, San Francisco. The structure will adjoin the new Matson building now under construction and will probably be sixteen stories in height. It will cost $1,250,000.

Federal Bank Building

Architect James W. Plachek of Berkeley is preparing plans for a two-story reinforced concrete bank building, 100x130, for the Federal Land Bank of the College City. It will be erected at the corner of Kittredge and Fulton streets, Berkeley, at an outlay of $100,000.

Crocker Oaks Residences

Three houses have been designed for Crocker Highlands and Crocker Oaks by Mr. A. Merrill Bowser, Hearst building, San Francisco. They will cost from $8500 to $15,000 each and are for Messrs. Irving Magnes, Albert Claassen and Dr. H. J. Samuels.

Returns From Abroad

Mr. Donald B. Parkinson, junior member of the firm of Messrs. John Parkinson and Donald B. Parkinson, architects, has returned from a European trip which was taken both as a wedding trip and for the purpose of studying architecture. Most of the time was spent in England, France, Italy, Sicily and Northern Africa. Mr. Parkinson was away seven months and brought back many water color drawings and sketches of interesting examples of European architecture.

Berkeley Parochial School

Plans have been completed by Architect J. O. Lofquist, 2149 Broadway, Oakland, for a two-story and basement frame and brick veneer parochial school for the Archbishop of San Francisco diocese. The building will be 60x150 feet and will contain auditorium, classrooms and library. Construction will be in charge of Mr. Henry McCullough, Berkeley contractor, and will cost $65,000.

Berkeley Fraternal Houses

Two new fraternity houses are to be constructed this spring in Berkeley, one on Piedmont avenue for the Kapa Sigma Fraternity, from plans by Architect C. C. Dakin, and the other on Durant street, near College avenue, for the Phi Mu Society, from plans by Architect W. H. Ratcliff, Jr..

Store and Loft Building

Two buildings have been designed by Architect A. G. Headman, Call building, San Francisco, for Mr. Mortimer S. Samuel. One will be built on Turk street, west of Taylor, and will contain stores, bowling alley and lofts, and the other will be a studio building on Sutter street.

Addition to Factory

Contract has been let to Lawton & Vezey to build a two-story reinforced concrete and brick addition, 200x60, to the Magnovox factory on East 14th street, Oakland. The production of this company has more than doubled since the radio came into popular use. The plans for the addition were made by Architect B. J. S. Cahill.

Pasadena Planning Commission

An ordinance creating a city planning commission for Pasadena has been passed, the commission to consist of twelve members, nine of which shall not be officers or employes of the city. Three are to be appointed by the board of directors from its own membership. The city engineer is authorized to attend and participate in the meetings of the commission but will not be entitled to a vote.

Engineer Declines Directorship

Mr. C. A. Heinze, former president of Los Angeles Chapter, American Association of Engineers, has withdrawn from the nomination for director of the national organization for the second district, comprising California and Nevada. Business duties prevent him accepting the position. Mr. Hubert P. Ferry, first vice-president of Los Angeles Chapter, has been nominated for national director, and members of the A. A. E. may write his name on the ballot which has been printed with a blank for the second district.

Hoover for Federal Development

Secretary of Commerce Herbert Hoover, is quoted as having said to Congressman Lineberger of California, that "If a Pacific Coast power company through James P. Girand, or anyone else, is able to persuade the Federal power commission to allow it to secure a permanent permit to develop Diamond creek, above Boulder Canyon, I think the time has come for me to resign as head of the commission. I am for government development of that project, and I always have been."

American Society of Civil Engineers

The proposed "Water and Power Act" which is to be submitted to the people of California at the November election was the topic for discussion at the regular meeting of Los Angeles Section, American Society of Civil Engineers, at the Los Angeles City Club, May 10. Mr. William Mulholland led the discussion in favor of the act and Mr. George F. Binckley led the discussion against it. Copies of the act are furnished through courtesy of the People's Economy League of all California Engineers.

Landscape Work

Mr. Emerson Knight, landscape architect, is preparing plans for Allen & Company for the gardens of four houses on Lake street, extending 240 feet from 29th to 30th avenues in Sea Cliff, San Francisco. Careful study is being made for a comprehensive and unified treatment of these places such as now characterizes the gardens of the three homes opposite for which the landscape work has just been completed by Mr. Knight.

Elected President

Honor recently was conferred upon a San Francisco architect, Mr. William Arthur Newman, by the Society of Constructors of Federal buildings in session at Washington, D. C., Mr. Newman being elected to the presidency of the Society by unanimous vote. Mr. Newman is assistant to Mr. J. W. Roberts, Superintendent of Construction and Repairs, U. S. Public buildings, San Francisco. An invitation has been extended to the National Society to hold its next convention in California.

Mr. Winslow the Architect

The full page half tone plate published on page 92 in the April number of The Architect and Engineer over the caption, "Entrance to Home in Monterey," was erroniously worded, being the entrace to the Adobe Flores in South Pasadena, an old restored adobe belonging to Mrs. C. E. Noyes. Mr. Carleton Monro Winslow of Los Angeles was the architect. It is a pleasure to give Mr. Winslow due credit for this very lovely picture.

The "Electric Towel"

One of the modern Electrical Appliances making rapid progress in new installations is "Airdry," the electric towel.

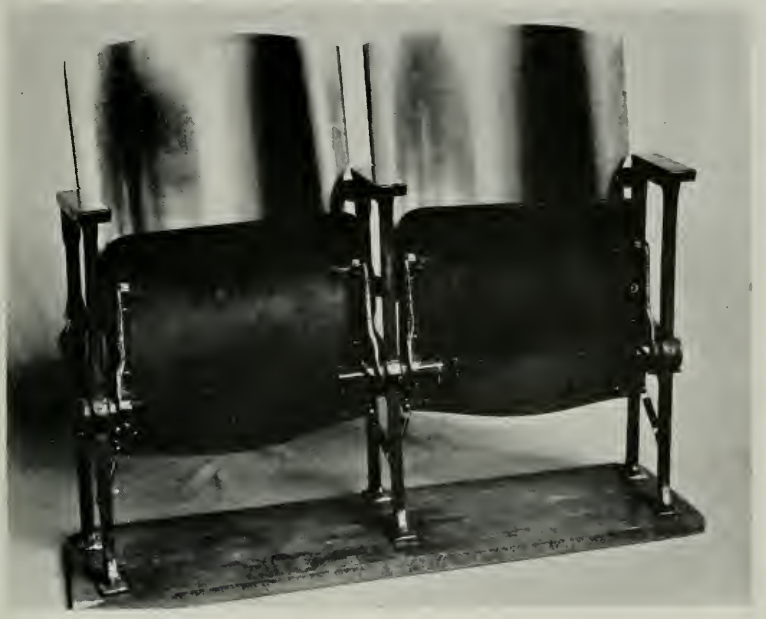
Press a pedal with the foot and warm air does the rest. That tells the story of "Airdry," an electrical appliance designed to eliminate towels in schools, hospitals, factories, public buildings, hotels, department stores, office buildings, etc. It consists of a white iron standard, containing a motor, a fan, heating element, and an adjustable nozzle for directing the flow of electrically heated air. The warm air discharged from the nozzle, causes evaporation and dries the skin thoroughly, preventing chapping. One of the greatest advantages to be found in the use of the "electric towel" is that no one touches what has been used by another.

"Airdry" thoroughly evaporates the water from the face or hands in twenty-eight to thirty-six seconds. It consumes 1 k. w. per hour, or per 100 operations. This is far less than the cost of towels of any description.

The "Airdry" is easily installed by providing a circuit of not smaller than No. 12 b. & s. Ga., wire to the nearest junction box. "Airdry" overcomes the unsightly condition of the lavoratory floor being littered with used towels, and reduces the fire hazard and janitor service. It also eliminates the possibility of clogged waste pipes. There are two models, a pedestal that is movable and a recess wall model for permanent installation.

The "electric towel" is manufactured by the Corona Airdry Corporation of Groton, N. Y., and is sold and distributed in California by the Airdry Co., of California, with offices at 155 Montgomery street, San Francisco.

With the Engineers



GENERAL VIEW SHOWING INTERLOCKING HINGE JOINT

Interlocking Device for Opera Chairs

An interlocking device for opera chairs has been invented by Mr. O. F. Wasmandorff of Lewistown Montana. Two photographs of models are shown, one being a general view and the other a detail picture. The new device is considered an improvement on present seating for auditorium, baseball park and moving picture theater chairs. Some of the advantages of the new device are given as follows:

To prevent pre-emption of aisle seats.

To prevent loss by undiscovered vacant seats in middle of audience.

To prevent annoyance of late comers squeezing past patrons already seated.

To prevent annoyance of those having witnessed performance squeezing past late comers in endeavoring to get out.

To turn up all vacant seats, making aisles of all vacant groups of seats.

To make all vacant seats readily visible and accessible.

To cut down number of ushers now necessary.

To increase seating capacity by re-arrangement of seats.

To make aisles of all rows of seats when audience arises.

To prevent accidents during possible panics which might have been caused by seats left down when unoccupied.

To facilitate sweeping out of auditorium as all seats are automatically turned up when not in use.

To prevent interference of incoming audiences with outgoing audiences.

To facilitate the emptying of theaters by new arrangement of aisles and exists suggested by the use of this device.

To cause the public to use certain aisles for entrance and certain other aisles for exit.

The model shown in the general view has been prepared to illustrate an interlocking hinge joint only. This picture does not present any particular style of chair, as any form of back or upholstered seat of any desired quality may be used with this interlocking device.

Points of interest in this picture are as follows: These chairs have been mounted on a base, the center standard being pushed back more than two inches from a straight line drawn between the two outer standards to demonstrate that this device will work perfectly where chairs are set on a radius as sharp as eight feet. The seat brackets are standard right and left brackets with a cam cast on each one to move an interlocking bolt as the chair is depressed. They are all interchangeable throughout the entire auditorium. Upper portion of the seat

DETAIL OF MAIN STANDARD

bracket slides sideways, where seats are placed on a decided radius, as seat is depressed, but the slides shown in this model are built out from the seat because the seat selected by the model maker is curved veneer. Where straight bottom chairs are used with upholstery this slide is much simplified. The end of seats have the same kind of tubing for hinge center as intermediate seats, but are shorter and need not be slotted.

Tubing of hinge is fitted loosely into the main chair standard, and is held in place by two flush set screws on top which are difficult to see in this picture.

The detail picture shows a portion of the main standard. Note that the standard is thickened for the slotted tubing to slip through. Two flush set screws hold the pipe in place after insertion. The center hole in front is for the wing nut. The latter, shown below, is given one-half turn after controlling chair seat is depressed, when it is desired to hold interlocking bolt out to keep chair from locking when not in use. The lower hole shown in main standard need not be there in the finished product. Cams cast on seat brackets show plainly here, also travel of seat bracket on clip above is easily detected by wear of paint on clip. This travel occurs when chairs are set on very short radius only.

Tubing inserted through brackets and main standard, forms the main journal bearing of hinges and is unbreakable. The parts which travel inside the tubing are shown below, consisting of cotter pin, compression spring, interlocking bolt, rubber bumper to make bolt noiseless, and another cotter pin. To reverse action of chairs reverse order of inserting moveable parts; then the opposite chair will control.

National Board of Engineers Defines Future Policy

THE national board of directors, American Association of Engineers,has issued a statement of policy which is to be pursued during the year. The declaration of the future policy of the board comes as a surprise and will undoubtedly be welcomed by every member of the California chapters. It is strictly in line with the policy which has been advocated for the past year by the local chapters.

The national board has struck upon a plan which, it is believed, will receive the unanimous approval and support of every chapter throughout the country.

The declaration follows:

The board of directors keenly appreciates the need of additional service on the part of the American Association of Engineers to its members and to the profession, and as such enlarged service can be obtained only by adopting and following a constructive program, therefore to this end the board of directors approves the following statement of policies:

(a) The employment service should be greatly extended and made more comprehensive and so organized that the benefits accruing therefrom may be more nearly equalized to members residing close to and far from Chicago.

(b) A determined effort should be made to render real service not only to all members, but to very large groups, such as railroad, Federal, practicing and in public service. The assistance extended to such groups should be from funds derived from fees and dues received from the entire membership.

(c) Continued efforts should be made to perfect the system in use at national headquarters to the end that the number of even occasional mistakes may be still further reduced.

(d) An exhaustive and unprejudiced investigation should be made of the suggested plan for the formation of practically autonomous districts or assemblies with paid staffs under the authority of national headquarters, which districts or assemblies would handle most of the detail work. This investigation should be made in the hope that the plan will result in quicker and better service to the members.

(e) If financially feasible, several energetic and enthusiastic field representatives should be provided whose duties will be to help in the organization of new clubs, chapters and assemblies and to stimulate and help existing ones, to harmonize disputes, facilitate co-operation between national headquarters and the smaller units, and to gain for headquarters a true insight into conditions affecting the association in all parts of the country.

And further, under present conditions, chiefly those imposed by financial consideration, it has been impossible to engage to the extent desired in these various activities, therefore the excutive committee is instructed to prepare and submit to the board of directors at its next meeting a plan and a budget for extended service in accordance with the above policies in the hope that the board may present to the Salt Lake convention plans satisfactory to the membership by which it may be possible to extend and initiate the service such as is the desire and wish of every member of the association.

The Contractor

THE BUILDING CODE SITUATION*

By DUDLEY F. HOLTMAN
Construction Engineer, National Lumber Manufacturers' Association.

DURING the past two years the National Lumber Manufacturers' Association has made a thorough field survey of building code conditions in every city of any importance in the United States. Our field representatives have devoted all of their time to this work and we now have in our files in Washington up-to-date accurate information, relative to the status of building ordinance legislation in practically every city in the country with a population of over 5,000. The information that we have obtained is kept up-to-date by means of a well-organized system of correspondence, so that our files show the current status of code activities in all of these cities.

Industries and building investment cannot proceed until all forms of cost inflation, which have loaded it with unnecessary capitalization charges, are removed. We must face the situation squarely. We must put aside all thoughts of special interest or privilege and prepare our building codes on the basis of a well-recognized minimum requirement.

A well prepared building law will do much to insure prompt investment in building. A poorly prepared building law, full of unwise and unnecessary restrictions, may so handicap building construction as to put a blight on the growth and prosperity of the community. **Every building law should be considered as a building service for the protection of the owners and occupants of buildings and as an assistance to builders, rather than as a restriction imposed upon them.** It should serve as an infallible guide to the minimum expense consistent with safety and dependability of building construction. For this purpose it should be sufficiently flexible to allow for individuality and selection and for efficiency and for changing conditions. If this is done it will allow sufficient competition to keep costs at a minimum for all forms of construction.

The lack of ordinances regulating construction in the majority of the cities of this country is astonishing. There are 1478 cities in this country of ours with a population of 5,000 or more. Our information indicates that only 410, or 27%, have a building law, and in all probability twenty or more of these laws are included as a part of the original city charter. Other cities claiming codes have what is merely a set of restrictions specifying the area known as the "fire limits." In the majority of cases, where fire limit restrictions only prevail, the ordinance merely specifies the area included within such limits and requires that the buildings erected therein shall have incombustible walls and roofs. They make no restrictions as to the allowable height of buildings. They say nothing about maximum areas between fire walls nor do they mention the character of interior construction. Any kind of a fire-trap interior may be constructed and it may cover any area as long as the exterior walls are masonry walls and the roofs supposedly incombustible. In all probability these kinds of laws are the only ones in effect in 65% of these 1,478 cities.

There are 259 cities with a population of over 25,000 and only 223, or 80%, of these cities give evidence of having a building code. Thirteen of these cities have codes with no enforcing officer, while 23 cities have no code whatever, but do have a building inspector.

Of the 460 cities with a population of from 10,000 to 25 000, only 116, or 25% have a building law, and 26 of these have no officer to enforce it. Of the total of 739 cities with a population ranging between 5,000 and 10,000, only 81, or 9%, have building laws, and 25 of these cities have no means of enforcing the law.

A number of the cities which have codes have no copies available for the use of the public or for the use of contractors and architects. Some of these regulations are hidden away in the minutes of the council meetings. A man who erects a building, or who has the supervision of the construction of a building in hand, must delve through musty records to determine what regulations he is expected to comply with.

It is very evident that the preparation and the enforcement of a building law is a specialty. It is a matter of such importance that the work should not be entrusted to any inexperienced or improperly constituted body. Experience during recent years indicates that building codes, in order to be most beneficial, must undergo frequent amendment and

*From an address, "Analysis of the Building Code Situation in the United States," delivered by Mr. Holtman before the National Conference of the Construction Industry held under the auspices of The National Federation of Construction Industries at the Drake Hotel, Chicago, April 5, 1922.

addition. Methods and materials of construction and the uses to which buildings are put are constantly changing. New economic conditions bring about new kinds of buildings and in any case there are a great number of minor contingencies for which it is impossible to provide in an ordinance. It has been found desirable, therefore, that the official in charge of building legislation be given the power to formulate and publish rulings elaborating upon the building code as enacted by the legislative body of the city.

A building code is intended to be a statement of the economic requirements as to quality of materials, grade of workmanship and methods of design which are considered necessary to make buildings safe, durable and otherwise satisfactory. A building code should not be too definite and detailed in its provisions lest it lose a part of its possibilities for good and unduly hamper private initiative and enterprise. In effect, therefore, such an ordinance usually is a compromise between the necessity of telling the public what is required of it, and of having a brief, flexible document for purposes of administration. Any building code represents the compromise at which its writers arrive at with regard to these two questions.

The lumber industry welcomes open competition. With the aid of certain fire prevention enthusiasts, "substitute" material manufacturers make an effort to legislate lumber out of markets where, as a material, it has a just claim for recognition. It is this kind of "competition by legislation" which the lumber industry finds particularly obnoxious and which it intends to make every effort to have stopped. Every material has its advantages and disadvantages and in the long run no propaganda can overcome the truth.

In my judgment it is not necessary to tell intelligent people that wood will burn. It is also pretty generally known that any residence is liable to destruction by fire. There are many safeguards which can be used in all kinds of building construction and slow burning construction is just as possible when wood is used as when other materials are used. There is a tendency, as a city grows, to enlarge the fire limits of that city until those limits extend way out into the suburban districts. The citizens owning a lot anywhere within those limits must either build "fireproof" or not build at all. The result is a great deal of undeveloped property. We might just as well recognize the fact that cost is an important element entering into the calculations which any prospective home owner makes. He should be encouraged to improve his property and he should be given an opportunity to build any kind of a house that he wants to as long as it meets with the ideas which the community entertains with respect to fire hazards. Tests have been made and are being made by the lumber manufacturers of the country, in co-operation with other manufacturing interests, which clearly indicate that certain types of construction, of which wood is the frame work, offer a resistence to attack by fire quite sufficient to protect them from any ordinary exposure hazard. These constructions should be recognized by city officials when they revise their codes.

The time has come when we must undertake to do everything that we can to encourage the salaried man to build and we must encourage him by offering him every inducement to "start something." This we can do in large measure by revising those antiquated, obsolete building ordinances which require him—if he builds now—to build nothing less than a "tomb" to meet all of the unnecessary restrictions imposed upon him by those enthusiastic elements of society whose battle cry is "fire."

Division of Costs in Highway Construction

What part of the cost of a road goes into grading and structures which are more or less permanent and what part goes into the paving which may eventually wear out?

This question is answered fully by statistics compiled by the Bureau of Public Roads of the U. S. Department of Agriculture on 1350 completed Federal-aid roads involving 7500 miles of road at a total cost of $112,000,000. Of the total cost, 21% went into grading, 14% structures, 62% paving and 3% for engineering. These are the average figures for the whole of the United States and there is considerable variation in different sections.

In the Middle Atlantic States where grading is not heavy and paving must be built for heavy traffic the cost of the paving rises to 75% and the grading and structures amount to 15% and 9% respectively.

In the Mountain States the problem is very different much of the work being new construction with heavy grading and where the highest type of surface is not necessary. In this group of States the cost of grading amounted to 33% structures 21% and paving 41%. The percentage for California in 1922 will probably be somewhat less than 25% for paving only.

Light pink Speckled Terra Cotta; Ornament in polychrome

ORPHEUM THEATRE
New Orleans, La.

G. Albert Lansburgh
Architect

COLOR *in* ARCHITECTURE

Chromatic possibility in Terra Cotta is wider than in any other permanently enduring material. It offers a practically unlimited palette for:

(1) Color interest in monochrome. *(2) Color interest in polychrome.*

All buildings, whatever the material, necessarily present a color scheme. Rightly conceived color is the chromatic effect in the entire ensemble, whether polychrome or monochrome.

In the building illustrated the polychrome ornament ties with the pink mottled field of ashlar. Both are Terra Cotta; the effect is harmonious unity.

With unity assured in the consistent qualities of ceramic coloring, Terra Cotta safely achieves the fullest chromatic richness either in monochrome or polychrome treatment.

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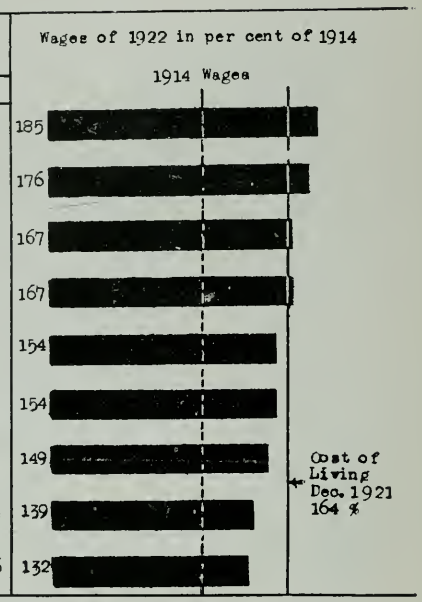
ARTISANS	Wages per Hour	
	1914	1922
Hod Carriers	.500	.925
Painters	.594	1.044
Carpenters	.625	1.044
Plasterers' Helpers	.625	1.044
Plumbers	.750	1.156
Struct. Iron Workers	.750	1.156
Stone Cutters	.700	1.044
Cement Finishers	.750	1.044
Bricklayers	.875	1.156



SAN FRANCISCO BUILDING TRADES WAGES AND COST OF LIVING

Building Wages and Cost of Living

THE actual relation of wages now being paid in certain typical cities to the wages paid in the same cities in 1914, and also the relation which the present wages bear to the cost of living in December, 1920, are shown by diagrams recently published in the index of the Associated General Contractors. This cost of living has just been determined by the Department of Labor.

In some instances, where more than one wage rate was paid either in 1914 or in 1922, the average representing existing conditions was used.

In general it is evident that the percentage increases of certain wages over pre-war wages is by no means uniform in the different trades, nor is the general average of these increases uniform in the different cities as compared with the changes in the cost of living. It is clear that the wages now being received by some of the trades enable them to buy more of the good things of life than they could with the pre-war wages, while in other cases the present wage will purchase a considerably poorer living than the wage which ruled in 1914.

In Boston, out of thirteen trades, three are receiving slightly more than sufficient wages to compensate for the present cost of living as compared with that of 1914, four are receiving almost enough, and six decidely less than sufficient to provide a scale of living equivalent to what could be bought under pre-war wages and conditions.

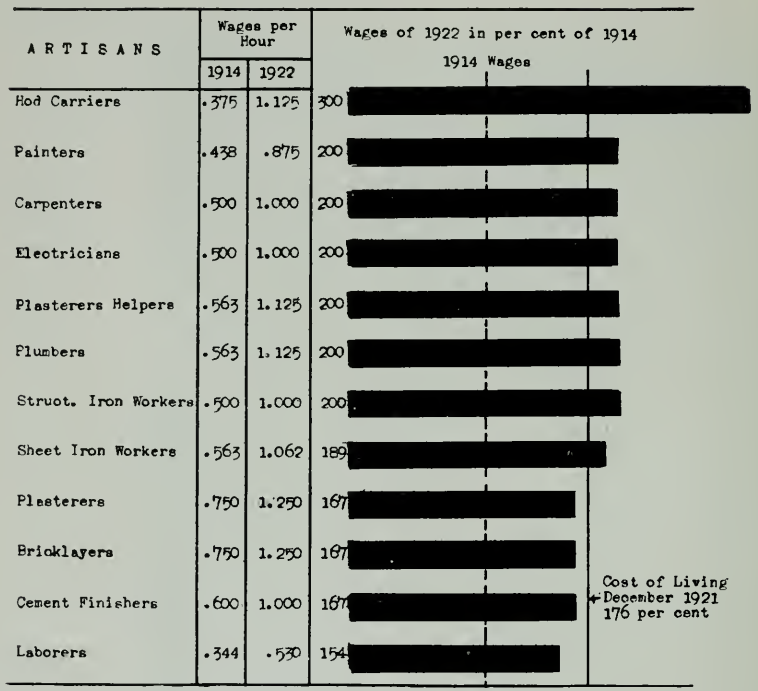
Workers in the building trades in Washington, D. C., have thus far been decidely more successful than those in other cities in boosting their effective wages above the pre-war standard. Every one of twelve Washington trades are receiving wages which, in purchasing power, are considerably in excess of the wages prevailing in 1914.

Baltimore is one of the cities where building trades artisans are better off financially than they were before the war. All but one of the ten trades are now receiving wages having a purchasing power in excess of the wages received in 1914.

The present wages paid in Chicago are those established by the Landis Decision. In the case of nine trades at least it appears that the rates under the Landis Decision are in no case sufficient to procure as good a living on the basis of present costs as was purchaseable by the wages prevailing in 1914.

In San Francisco four of the nine trades considered are enjoying wage rates sufficient to more than compensate for the increase in the cost of living, and five are receiving less than that requirement.

In Los Angeles, eight out of twelve trades are receiving wages sufficient to



LOS ANGELES BUILDING TRADES WAGES AND COST OF LIVING

substantially more than compensate for the present cost of living as compared with the pre-war cost. On the other hand, four of the trades, among them common labor, are receiving less than sufficient to compensate for the increased cost of living.

Planning New City

Mr. Charles H. Cheney, City Planning Expert, has been retained to assist in planning the Palos Verdes project in Southern California. Mr. Cheney recently went over the St. Francis Wood tract with Senator N. W. Thompson and Elvon Musick, as the restrictions, landscaping and general layout there are to be taken as a model in the new Southern city. Olmstead Bros., landscape architects, who subdivided and planted St. Francis Wood, will have charge of the same part of the work in the Los Angeles project.

Concrete Roads Discussed by Institute at Cleveland Convention

While it was something of an experiment for the American Concrete Institute to hold its eighteenth annual convention in Cleveland after a number of years in which it had built up a large local following in Chicago, the attendance at the convention held in the Hotel Winton, February 13-16 was surprisingly good, not only in number, but in sustained interest, especially in view of the fact that the convention was extended over four days instead of three as has been usual. The registered attendance was 286 in Cleveland as compared with 244 in Chicago the previous year.

The membership at the time of the Chicago convention in 1920 was 428; at the time of the Chicago convention in 1921, 627; and at the close of the 1922 convention, 873.

The committee on Concrete Roads and Pavements, Mr. Clifford Older, chairman, Mr. C. R. Ege, secretary, presented through Mr. Ege a discussion of the existing situation in which the concrete road builders find themselves unable to make definite recommendations as to changes in standards for concrete road construction owing to a number of important tests and investigations which are still incomplete. Revised standards are very much needed and this will probably loom as the big job for Committee S-6 in the present year.

Mr. George A. Sherron, presented excellent moving pictures of concrete road construction, showing modern plant methods and equipment.

Mr. A. B. Cohen, Chairman Committee S-2, Reinforced Concrete Highway Bridges and Culverts, selected for the subject matter of the committee's report the problems of waterproofing, expansion joints, construction joints and drainage in connection with bridge work. The committee expressed the belief that the embodiment of good practice is not confined to theoretical economies based upon actual quantities of concrete, steel reinforcement and other materials, and that the surety of a positive water repellant protection, the development of an effective expansion joint, the determination and arrangement of construction joints that will not weaken the structure nor exceed the capacity of a plant layout commensurate with the magnitude of the work, and finally the distribution of a drainage system to downspouts, are subjects of equal importance.

Commenting on one phase of the convention "Concrete" says editorially:

There is almost overwhelming testimony from concrete building contractors that the proposal of the Joint Committee to permit the specification of concrete by strength is unworkable with our present knowledge and field control. There is also a seeming disregard of the predicament of the engineer who is trying to design a building economically and safely, when he can't rely within 500 to 1000 lbs., upon the contractor's ability to deliver a building whose structural members may not test up to requirements.

There are unquestionably matters of the economical field control of concrete proportioning, mixing, placing and curing which would put the builder under a severe handicap, making lawsuits almost a certainty, if he had to guarantee say 2000 lbs., strength on twenty-eight day tests. The contractors point to thousands of their buildings which are entirely satisfactory and rest their case largely on that and the fact that the results from test cylinders under test

conditions imposed are not truly indicative of strength in the building.

The fundamental situation remains the same; what is the use of accurate design which is to be executed by inaccurate construction? A kind of keynote in the discussion, which lasted all through the last day of the Institute's Cleveland convention, was sounded by Ernest Ashton when he put the matter up to the contractors like this:

"I note that most of those who have discussed this matter view with considerable alarm and apprehension the great variation existing in concrete test specimens; I wonder whether they view with the same alarm and apprehension the concrete that they now have in structures—where there was very little or no control?"

Rural Landscapes Futuristic Nightmare

Speaking of advertising signs along highways, Mr. A. R. Hirst, State Highway Engineer of Wisconsin says: "Heaven knows there are enough avenues of publicity open to those who wish to sell their goods without making our rural landscapes a futuristic nightmare."

The State and counties, by legislation, can keep advertising signs off the highways rights of way, but only public opinion, probably, can stop the desecration of the landscape. If an outraged public would boycott advertisers who persist in disfiguring nature with commercial appeals, the practice would soon cease. Protection of natural beauty should be inculcated at schools so the next generation will be possessed of an aesthetic sense that will refuse to countenance such practices.

Unsightly Bill Boards

Vigorous protest against further marring the beauty of American highways and interfering with the safety of motor travel by obstructing the view of the tracks in the vicinity of grade crossings with large advertising signs was voiced in a resolution adopted at the late convention of the Asphalt Association, the national organization of paving producers and contractors.

Bearing in mind a severe criticism of the dangerously narrow width of American roads uttered by Mr. Joseph D. Draney, president of the Association, in his annual address, the convention also adopted a resolution urging a minimum width for highways serving large cities of twenty-four feet so as to afford more room for the increasing traffic. "I have ridden over more dangerous roads in the vicinity of New York," said Mr. Draney, "than one will find, for instance, in the whole of England."

Kewanee Boiler Company Establishes Factory Branch

The Kewanee Boiler Company, manufacturers of Kewanee boilers built for thirty-five years have established direct San Francisco and Los Angeles factory branches in order to better serve their customers. The San Francisco office is at 216 Pine street (Exposition building) and is in charge of Mr. C. U. Martin who has been selling Kewanee products in California for twenty years or more. Mr. Martin also has full supervision of the Los Angeles office which is at 420 East Third street. Until recently Mr. Martin was actively interested in the management of the California Hydraulic Engineering & Supply Company, in fact he is still vice-president of the company.

During twenty-two months of the War the Kewanee Boiler Company shipped to the Government alone over 22,000 boilers, tank heaters and garbage burners, all of their own manufacture, and although this increase in business necessitated large extensions of the plant, which now occupies over 32 acres, their recovery from the after war depression in business has been really remarkable. Recent advices from the factory are that the plant is working full time with over 1100 men on the pay roll.

The Kewanee plant is the largest plant devoted exclusively to the manufacture of steel boilers and radiators in the United States. They commenced building steel boilers thirty-five years ago, and have grown to their present size by specializing on steel heating boilers.

Takes New Name

The Wayne Tank & Pump Company is the name under which the Wayne Oil Tank & Pump Company will operate in the future, according to an announcement of Mr. Chas. E. Pask, advertising manager of the company. The change in name was found advisable in view of the recent purchase of the Barromite Company of America by the Wayne Oil Tank & Pump Company, Fort Wayne, Indiana.

The Barromite Company of America formerly controlled the patent rights and sold Barromite water-softening system and these will be marketed under the name of the Wayne Water Softening System.

An Attractive New Wall Bed

With the return to San Francisco of Mr. Gordon F. Cane, president and general manager of the California Wall Bed Company, formerly the American Automatic Lock & Lift Company, announcement is made that the firm intends to broaden its scope of operation to include the entire United States and Canada. Mr. Cane believes that with the improvements that have been made to California Wall Beds, the future of his company is most promising. Agencies are now being established in all the principal cities in the United States and Canadian territory and besides the San Francisco factory, arrangements have been made with the Simmons Bed Company of Kenosha, Wisconsin, to manufacture the beds to take care of the Eastern business.

One great advantage of the "California" bed is the comparatively small space required for its installation. But sixteen inches depth of closet room is required for the bed, and when the bed is up there are two very handsome French doors which add beauty and spaciousness to the room. These French doors are pivoted in the center and may be swung around at the slightest touch. When the bed swings into the room there is an opening of sixteen inches to the closet. The closet may be entered when the bed is down by moving the latter to one side or to the other. All attachments are underslung. There is nothing to catch or tear mattresses or bed clothing. The bed is equipped with both head and foot frames which give it the appearance of a real piece of furniture when down. When the bed is closed these frames are brought over the bed clothing and act as a tie instead of the old-fashioned steel clamps which tear and muss the bed clothing. The "California" offers a great variety of styles in both square and round tubing which please both architect and client. Many methods of installing beds may be seen at their showrooms, where both architect and client are welcome.

The company's main office and salesrooms are at 714 Market street, San Francisco, with salesroom and factory at 165 13th street, Oakland. Officers of the company are: President and manager, Gordon F. Cane; vice-president, A. V. Clark of N. Clark & Sons; secretary and treasurer, George Bennett, formerly of Bennctt Bros. Hardware Company.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912,

Of THE ARCHITECT AND ENGINEER, published monthly at San Francisco, California, for April 1st, 1922.

State of California,
County of San Francisco,
ss.

Before me, a Notary in and for the State and county aforesaid, personally appeared W. J. L. Kierulff, who, having been duly sworn according to law, deposes and says that he is the manager of THE ARCHITECT AND ENGINEER, Inc., and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Name of — Post Office Address

Publisher, W. J. L. Kierulff, 627 Foxcroft Bldg., San Francisco.

Editor, F. W. Jones, 627 Foxcroft Bldg., San Francisco.

Business Manager, W. J. L. Kierulff, 627 Foxcroft Bldg., San Francisco.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

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W. J. L. KIERULFF, President.

Sworn to and subscribed before me this 25th day of March, 1922.

A. W. HEALEY,
Notary Public in and for the City and County of San Francisco, State of California.

My Commission expires August 29, 1925.

BOOK REVIEWS

Edited by
AUGUST G. HEADMAN, Architect

COMMUNITY BUILDINGS FOR INDUSTRIAL TOWNS—Community Service, One Madison Avenue, New York, price 75c. A series of twelve Bulletins devoted to discussions of the various phases of the Memorial Building Movement are available through Community Service without charge.

THE industrial center club building is not a new idea either in this country or in Europe, but there are strong present day tendencies in such buildings which are a definite post-war development. How marked these tendencies have become may be observed by a study of "Community Buildings for Industrial Towns," a publication just issued "to meet the needs of a large number of industrial organizations, individuals and communities."

This publication, the result of studies of the whole field made during 1921, is largely a discussion of some carefully chosen examples of such buildings from the standpoint of architecture, administration and scope of activities. There are conclusions to be drawn from it which cannot fail to interest the local architect. Notably; there is a large and steadily increasing demand for industrial center buildings; these buildings ,even when financed solely by the industry, must be broadly democratic in their appeal; they must be so planned as to interest people of all ages and of both sexes.

Even the earliest forms of "welfare clubs" provided within industrial establishments are found to have gradually become democratic in their control, and are being remodeled, enlarged, or replaced often by the workers or by an intra-works organization representing the employers and the employed. The latter, no less than the former, have "come to realize more fully the significance of recreational activities which identify the worker with community life. The community house, where the worker in his leisure hours meets the people of the neighborhood who may or may not be associated with him in the industry, helps to provide an outlet, for the normal instincts of sociability and companionship."

Those responsible for the newest and most distinctive developments in industrial center social buildings have been noticeably alert in incorporating into them just those features which have contributed most to the success of the memorial community buildings of the country. While nothing approximating a standard of community house architecture has developed to date, a study of the World War "memorials of democracy" the country over will show that there is a well defined minimum of requirements for the building of a given type. These requirements, adapted to the situation under discussion, are admirably set forth in "Community Buildings for industrial Towns" in the form of full floor plans for three buildings ranging in price from $45,000 to $275,000. (Jallade, Lindsay and Warren, architects, 129 Lexington avenue, New York).

It goes without saying that the local situation demands of the architect as well as of the industrial heads or of the local building committee, a knowledge of the most modern devolepments in social buildings. It may be added, that it demands as well at least some degree of social mindness on the part of the architect if these buildings in the aggregate are going to develop into something really fine, into a genuine contribution to the social life of America. If the auditorium, for instance, is successful as a gymnasium, it will inevitably develop an enthusiasm for indoor sports which will demand exclusive gymnastic facilities. Bowling alleys, a swimming pool, a running track. To whom but to the architect would it occur that even the choice of the building site should be such as to permit of additions to the building or future excavation for a basement floor?

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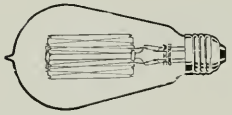
AT MARTINEZ, CONTRA COSTA COUNTY



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JUNE 1922

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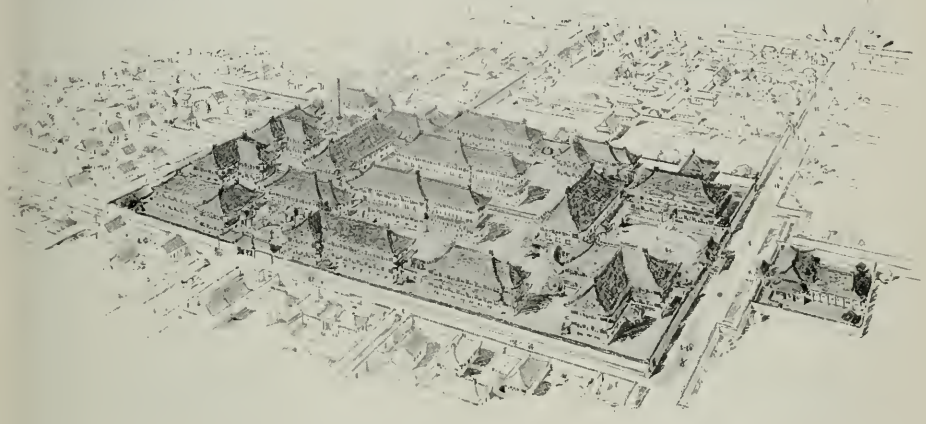

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CEMENT
Atlas Portland Cement Co., agencies in all principal Coast cities.
Best Bros. Keene's Cement Co., John R. Steffens-Lomax Co., Agents, Monadnock Bldg., San Francisco.
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.
Medusa White Portland Cement, manufactured by Sandusky Cement Co., represented in San Francisco by Pacific Materials Co., Underwood Bldg., San Francisco.
Old Mission Portland Cement Co., Mills Bldg., San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Armorite, soly by W. P. Fuller & Co., all principal Coast cities.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CLAY PRODUCTS
Cannon & Co., Sacramento, Cal.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Tropico Potteries, Inc., Glendale, Cal.
United Materials Co., Sharon Bldg., San Francisco.
S. & S. Tile Company, San Jose, Calif.

CLOCKS—ELECTRIC TIME
Pacific Electric Clock Co., 714 Wells-Fargo Bldg. San Francisco.
Standard Electric Time Co., 161 Market St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.
Cyclops Iron Works, 837 Folsom St., San Francisco.

COMPOSITION FLOORS
"Linotol" plastic flooring, Hill, Hubbell & Co., 115 Davis St., San Francisco; 410 San Fernando Bldg., Los Angeles.

CONCRETE BUILDING ACCESSORIES
John R. Steffens-Lomax Co., 951 Monadnock Bldg., San Francisco.

CONCRETE OR CEMENT HARDENER
Gunn, Carle & Co., Inc., 444 Market St., San Francisco.

CONCRETE MIXERS
Foote and Jaeger mixers sold by Edward R. Bacon Co., 51 Minna St., San Francisco, also Los Angeles.
Ransome mixers sold by the Garfield Co., Hearst Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

CONCRETE REINFORCEMENT
Edw. L. Soule Co., Rialto Bldg., San Francisco.
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Clinton Welded Wire Fabric, Wickwire Spencer Steel Corporation, 111 Townsend St., San Francisco.
Judson Mfg. Co., 817-821 Folsom St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Triangle Mesh Fabric. Sales agents, Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., 527 Tenth St., San Francisco.
Badt-Falk Co., Call-Post Bldg., San Francisco.

CONDUITS
Garnett Young & Co., 612 Howard St., San Francisco.

CONTRACTORS, GENERAL
Barrett & Hilp, 918 Harrison St., San Francisco.
Larsen-Siegrist Co., Inc., 807 Claus Spreckels Bldg., San Francisco.
R. W. Littlefield, 357-12th St., Oakland.
K. E. Parker Co., Inc., Clunie Bldg., San Francisco.
Dinwiddie Construction Co., Crocker Bldg., San Francisco.
Ruegg Bros., California Commercial Union Bldg., San Francisco

ARCHITECTS' SPECIFICATION INDEX—Continued

John M. Bartlett, 357 Twelfth St., Oakland.
Chas. Stockholm & Son, Monadnock Bldg., San Francisco.
Herbert Beckwith, Everson Bldg., Oakland.
Collman & Speidel, 546 Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Monson Bros., 251 Kearny St., San Francisco.
Fontanella & Teza, 1682 Eddy St., San Francisco.
Geo. Wagner, 251 Kearny St., San Francisco.
T. B. Goodwin, 180 Jessie St., San Francisco.
McLeran & Co., R., Hearst Bldg., San Francisco.
Robert Trost, 26th and Howard Sts., San Francisco.
I. M. Sommer, 401 Balboa Bldg., San Francisco.
Jas. L. McLaughlin, 251 Kearny St., San Francisco.
Alfred H. Vogt, 185 Stevenson St., San Francisco.
Lange and Bergstrom, Sharon Bldg., San Francisco and Washington Bldg., Los Angeles.

CONTRACTORS' EQUIPMENT
Edward R. Bacon Co., 51 Minna St., San Francisco, and Los Angeles.
Garfield & Co., Hearst Bldg., San Francisco.
Smith, Booth-Usher Co., 60 Fremont St., San Francisco; 228 Central Ave., Los Angeles.

CONVEYING MACHINERY
Messe & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CONVENIENCE OUTLETS
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard St.

CORK TILE
David E. Kennedy, Inc., 305 Crocker Bldg., San Francisco.
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

CRUSHED ROCK
Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.

CURTAINS—STEEL, ROLLING, FIREPROOF
J. G. Wilson Corp., 621 N. Broadway, Los Angeles.

DAMP-PROOFING AND WATERPROOFING
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Samuel Cabot Co., Boston; represented in San Francisco by Pacific Materials Co., Underwood Bldg., San Francisco.
"Pabco" Damp-Proofing Compound, sold by the Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

DOOR HANGERS
McCabe Door Hanger Company, leading hardware stores.
Pitcher Hanger, sold by National Mill & Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Waterhouse-Wilcox Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Oregon.
Stanley Works, New Britain, Conn... Monadnock Bldg., San Francisco.
Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

DRAIN PIPE AND FITTINGS
"Corrosion" Acid Proof, manufactured by Pacific Foundry Co., Harrison and 18th Sts., San Francisco.
Pacific Foundry Co., Harrison and 18th Sts., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Drinking Faucet Co., 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 166-7th St., San Francisco.
San Francisco Elevator Company, Inc., 860 Folsom St., San Francisco.

ELECTRICAL CONTRACTORS
Butte Electrical Equipment Company, 530 Folsom St., San Francisco.
Butte Electric & Manufacturing Co., 534 Folsom St., San Francisco.
Brown-Langlais Electrical Construction Co., 313 5th St., San Francisco.
Central Electric Company, 185 Stevenson St., San Francisco.
NePage, McKenny Co., 589 Howard St., San Francisco.
Newbery Electrical Co., 359 Sutter St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
Globe Electric Works, 1959 Mission St., San Francisco.
M. E. Ryan, Redwood City, and 520 Clunie Bldg., San Francisco.
H. S. Tittle, 766 Folsom St., San Francisco.
Spott Electrical Co., Sixteenth and Clay Sts., Oakland.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Pacific Bldg., San Francisco.

ELECTRIC TOWEL
The AIRDRY Electric Towel for clubs, office buildings, hotels, schools, etc., represented on Pacific Coast by Airdry Co., of California, 155 Montgomery St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

ELECTRICAL SUPPLIES AND EQUIPMENT
Garnett Young & Co., 612 Howard St., San Francisco.
Harvey Hubbell, Inc., Bridgeport, Conn., represented in San Francisco by Garnett Young & Co., 612 Howard St.
Safety Electric Company, 56-65 Columbia Square, San Francisco.
Drendell Electrical & Mfg. Co., 1345 Howard St., San Francisco.
Western Electric Safety Mfg. Co., Inc., 247 Minna St., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 166-7th St., San Francisco.
San Francisco Elevator Co., 860 Folsom St., San Francisco.

ENGINEERS—CONSULTING, ELECTRICAL, MECHANICAL
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.
Ralph E. Dodge, 251 Kearny St., San Francisco.

ELEVATOR DOOR HARDWARE
Richards-Wilcox Mfg. Co., Underwood Bldg., San Francisco.

FAIENCE TILE
Tropico Potteries, Inc., Glendale, Cal.

FELT—ASPHALT, DEADENING
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FENCES—WIRE AND IRON
Standard Fence Construction Co., 245 Market St., San Francisco, and 316-12th St., Oakland; 320 Los Angeles St., Los Angeles.

FILLING STATION EQUIPMENT
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco, 830 S. Los Angeles St., Los Angeles.

FIRE EXIT LATCHES
Vonnegut Hardware Co., Indianapolis, Ind.

FIRE ESCAPES
Michel & Pfeffer Iron Works, 1415 Harrison St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE-PROOF DOORS
Forderer Cornice Works, 269 Potrero Ave., San Francisco.
U. S. Metal Products Co., 330-10th St., San Francisco.
Fire Protection Products Co., 3117-20th St., San Francisco.
Kinnear Mfg. Co., represented in San Francisco by Pacific Materials Co., Underwood Bldg.
The J. G. Wilson Corporation, 621 North Broadway, Los Angeles.

FIRE SPRINKLERS—AUTOMATIC
Fire Protection Engineering Co., 67 Main St., San Francisco.
Grinnell Company of the Pacific, 453 Mission St., San Francisco.
Independent Automatic Sprinkler Co., 72 Natoma St., San Francisco.
Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.

FIRE RETARDING PAINT
The Paraffine Companies, Inc., 34 First St., San Francisco.

FIXTURES—BANK, OFFICE, STORE, ETC.
Home Manufacturing Company, 543 Brannan St., San Francisco.
The Fink & Schindler Co., 218-13th St., San Francisco.
Mullen Manufacturing Co., 64 Rausch St., San Francisco.
C. F. Weber & Co., 985 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

FLOORS—TILE, CORK, ETC.
Mangrum & Otter, 827 Mission St., San Francisco.
S. & S. Tile Company, San Jose.
Van Fleet-Freear Co., 61 New Montgomery St., San Francisco, and 420 S. Spring St., Los Angeles.
David E. Kennedy, Inc., 305 Crocker Bldg., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FLOORS—HARDWOOD
Oak Flooring Manufacturers' Association of the United States, Ashland Block, Chicago, Ill.
Cadwallader, Gibson Co., 234 Steuart St., San Francisco.
Parrott & Co., 320 California St., San Francisco.
Strable Hardwood Company, 511 First St., Oakland.
E. L. Bruce Co., Manufacturers, Memphis, Tenn.
O. M. Simmons Co., 115 Mission St., San Francisco.
Griffin Sheet Metal Works, Fresno.

ARCHITECTS' SPECIFICATION INDEX—Continued

FLOORS—MASTIC—FLOOR COVERING
- Hill, Hubbell & Company, 115 Davis St., San Francisco.
- The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

FUEL OIL SYSTEMS
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- S. F. Bowser & Co. Inc., 612 Howard St., San Francisco.
- Wayne Tank and Oil Co., 631 Howard St., San Francisco.

FURNACES—WARM AIR
- Mangrum & Otter, 827 Mission St., San Francisco.
- Montague Range and Furnace Co., 826 Mission St., San Francisco.
- Pacific Heating Company, Second and Grove Sts., Oakland.

FURNITURE—BUILT-IN
- Hoosier Kitchen Cabinet Store, Pacific Bldg., San Francisco.

FURNITURE—SCHOOL, CHURCH, ETC.
- Home Manufacturing Company, 543 Brannan St., San Francisco.
- C. F. Weber & Co., 985 Market St., San Francisco.
- Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
- F. W. Wentworth & Co., 539 Market St., San Francisco.
- W. & J. Sloane, 216 Sutter St., San Francisco.

GARAGE HARDWARE
- The Stanley Works, New Britain, Conn., Coast sale offices, San Francisco, Los Angeles and Seattle, Wash.
- Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

GLASS
- American Window Glass Co., represented by L. H. Butcher Co., 862 Mission St., San Francisco.
- Cobbledick-Kibbe Glass Co., 175 Jessie St., San Francisco.
- Fuller & Goepp, 32 Page St., San Francisco, and Syndicate Bldg., Oakland.
- W. P. Fuller & Company, all principal Coast cities.

GRADING, WRECKING, ETC.
- Dolan Wrecking & Construction Co., 1607 Market St., San Francisco.

GRANITE
- California Granite Co., Builders' Exchange, San Francisco.
- Raymond Granite Co., Potrero Ave., and Division St., San Francisco.

GRAVEL AND SAND
- Coast Rock & Gravel Co., Call-Post Bldg., San Francisco.
- Del Monte White Sand, sold by Del Monte Properties Co., Crocker Bldg., San Francisco.

GYMNASIUM EQUIPMENT
- Ellery Arms Co., 583 Market St., San Francisco.

HARDWARE
- Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.
- The Stanley Works, New Britain, Conn.; Coast sales offices, San Francisco, Los Angeles, and Seattle, Wash.
- Corbin hardware, sold by Palace Hardware Co., 581 Market St., San Francisco.
- Richards-Wilcox Mfg. Co., Aurora, Ill., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.
- Vonnegut hardware, sold by Abeel-Jensen Co. Call Bldg., San Francisco.

HARDWDOD LUMBER—FINISH, ETC.
- Parrott & Co., 320 California St., San Francisco.
- Strable Hardwood Company, First St., near Broadway, Oakland.
- E. L. Bruce Company, American oak flooring, Memphis, Tenn.

HEATERS—AUTOMATIC, GAS, ELECTRIC
- Electric Sales Service Co., manufacturers of Therm-elect Water Heater, West Berkeley.
- Pittsburg Water Heater Co., 478 Sutter St., San Francisco.
- Pure Air Gas Heating Co., 401 Battery St., San Francisco.
- Ra-Do Fumeless Gas Heater, sold by Baird-Bailhache Company, 478 Sutter St., San Francisco.

HEATING AND VENTILATING CONTRACTORS' EQUIPMENT, ETC.
- Atlas Heating and Ventilating Company, Inc., Fourth and Freelon Sts., San Francisco.
- Alex Coleman, 706 Ellis St., San Francisco.
- Gilley-Schmid Company, 198 Otis St,, San Francisco.
- Hateley & Hateley, Mitau Bldg., Sacramento.
- Mangrum & Otter, 827-831 Mission St., San Francisco.
- Lawson & Drucker, 450 Hayes St., San Francisco.
- Carl T. Doell, 467 21st St., Oakland.
- F. L. Warner, 2206 San Pablo Ave., Oakland.
- Luppen, Hawley & Thing, 906 7th St., Sacramento.
- James A. Nelson, 517 Sixth St., San Francisco.
- Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
- William F. Wilson Co., 328 Mason St., San Francisco.
- Pacific Fire Extinguisher Co., 424 Howard St., San Francisco.
- Scott Company, 243 Minna St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

W. H. Picard and F. J. Edwards, 5656 College Ave., Oakland.
Tiltz Engineering & Equipment Co., 479 Monadnock Bldg., San Francisco.

HOLLOW TILE BLOCKS
Cannon & Co., plant at Sacramento; 770 O'Farrell St., San Francisco.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

HOSPITAL FIXTURES
Mott Company of California, 553 Mission St., San Francisco.

HOSPITAL SIGNAL SYSTEM
Chicago Signal Co., represented by Garnett Young & Co., 612 Howard St., San Francisco.

HOTELS
St. Francis Hotel, Powell, Geary and Post Sts., San Francisco.

ICE MAKING MACHINERY
Cyclops Iron Works, 837 Folsom St., San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and 10th and Bryant Sts., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSULATION—CORK
Van Fleet-Freear Co., Sharon Bldg., San Francisco.

INSURANCE BROKERS
William Healey & Son, Crocker Bldg., San Francisco.

INTERIOR DECORATORS
Martin & Frederick, 1374 Sutter St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
A. Quandt & Son, 374 Guerrero St., San Francisco.

JAIL EQUIPMENT
Ralston Iron Works, 20th and Indiana Sts., San Francisco.

KITCHEN CABINETS
Hoosier Kitchen Cabinet Store (O. K. Brown, Mgr.), Pacific Bldg., San Francisco.

KITCHEN EQUIPMENT
Griffin Sheet Metal Works, Fresno.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 553 Mission St., San Francisco.

LANDSCAPE ARCHITECT
Emerson Knight, 704 Market St., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 514-516 Phelan Bldg., San Francisco.

LATHING AND PLASTERING
MacGruer & Simpson, 226 Tehama St., San Francisco.
A. Knowles, Call-Post Bldg., San Francisco.

LATHING MATERIAL—WIRE, ETC.
Pacific Materials Co., 525 Market St., San Francisco.
Truscon Steel Co., Tenth St., near Bryant, San Francisco.
Wickwire Spencer Steel Corporation, 111 Townsend St., San Francisco.

LIGHT, HEAT AND POWER
Great Western Power Company, Stockton St., near Sutter, San Francisco.
Pacific Gas & Electric Co., Sutter St., San Francisco.

LIGHTING FIXTURES
Thomas Day Company, Mission, near Third St., San Francisco, and Oakland.
Roberts Mfg. Co., 663 Mission St., San Francisco.
Electric Appliance Co., 807 Mission St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., 562 Mission St., San Francisco.
The Paraffine Companies, factory in Oakland; office, 34 First St., near Market, San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.
David E. Kennedy, Inc., Crocker Bldg., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Hart-Wood Lumber Co., Fifth and Berry Sts., San Francisco.
Pacific Manufacturing Company, San Francisco, Oakland, Los Angeles and Santa Clara.
Pope & Talbot, foot of Third St., San Francisco.
Santa Fe Lumber Co., 16 California St., San Francisco.
Sunset Lumber Company, First and Oak Sts., Oakland.

MAGNESITE FLOORING, STUCCO, ETC.
Dorite Mfg. Co., 116 Utah St., San Francisco; Metropolitan Bldg., Los Angeles.

MAIL CHUTES
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., 523 Market St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

MANTELS—WOOD, TILE, ETC.
Mangrum & Otter, 827-831 Mission St., San Francisco.
Fink & Schindler, 218-12th St., San Francisco.

MANUAL TRAINING EQUIPMENT
Richards-Wilcox Mfg. Co., Ewing-Lewis Co., 626 Underwood Bldg., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Ray Cook Marble Company, foot of Powell St., Oakland.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.
Tompkins-Kiel Marble Company, 505 Fifth Ave., New York; also Chicago, Philadelphia and San Francisco.

METAL DOORS AND WINDOWS
Fire Protection Products Co., 3117-20th St., San Francisco.
Waterhouse-Wilcox Co., Inc., 523 Market St., San Francisco.
U. S. Metal Products Co., 330 Tenth St., San Francisco.

METAL FURNITURE
Forderer Cornice Works, 269 Potrero Ave., San Francisco.

METAL TOILET—PARTITIONS
John R. Steffens-Lomax Co., 951 Monadnock Bldg., San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Los Angeles, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218-13th St., San Francisco.
Lannom Bros. Mfg. Co., 5th and Magnolia Sts., Oakland.

NOTARY PUBLIC
William Healey & Son, 208 Crocker Bldg., San Francisco.

OIL BURNERS
Bunting Iron Works, 1215 First Nat. Bank Bldg., San Francisco.
Coen Co., Inc., 112 Market St., San Francisco
Fess System Co., 220 Natoma St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
T. P. Jarvis Manufacturing Co., 275 Connecticut St., San Francisco.
G. E. Witt Co., 862 Howard St., San Francisco.
W. S. Ray Manufacturing Co., 29 Spear St., San Francisco.
F. L. Warner, 696-20th St., Oakland.

OIL STORAGE AND DISTRIBUTING STATIONS
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Oil Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
Federal Ornamental Iron and Bronze Co., 16th St., and San Bruno Ave., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison St., San Francisco.
Palm Iron & Bridge Works, Sacramento.
C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.

OVERHEAD CARRYING SYSTEMS
California Hydraulic Engineering & Supply Co., 70-72 Fremont St., San Francisco
Richards-Wilcox Mfg. Co., Aurora, Ill., and Underwood Bldg., San Francisco.

PANIC DOORS
Vonnegut hardware, sold by Abeel-Jensen Co. Call Bldg., San Francisco.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
The Paraffine Companies, Inc., 34 First St., San Francisco.
Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.
Hill, Hubbell & Company, 115 Davis St., San Francisco.

PAINTING—SPRAY EQUIPMENT
Pneumatic Painting Machinery Co., 1046 Monadnock Bldg., San Francisco.

PAINTING, TINTING, ETC.
I. R. Kissel, 1747 Sacramento St., San Francisco.
D. Zelinsky & Sons, San Francisco and Los Angeles.
The Tormey Co., 681 Geary St., San Francisco.
A. Quandt & Son, 374 Guerrero St., San Francisco.

PAINTS, OILS, ETC.
Magner Bros., 414-424 Ninth St., San Francisco.
Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco and all principal Coast cities.
R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
W. P. Fuller & Co., all principal Coast cities.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

PARTITIONS—FOLDING AND ROLLING
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Farncisco.
"Lupton" Steel Sash, Waterhouse Wilcox Co., San Francisco, Los Angeles, San Diego.

PIPE—STEEL AND WROUGHT IRON
Western Pipe & Steel Co., 444 Market St., San Francisco; 1758 N. Broadway, Los Angeles.

PIPE FITTINGS
Victory Manufacturing Co., Monadnock Bldg., San Francisco.

PLASTERING CONTRACTORS
A. Knowles, Call Bldg., San Francisco.
MacGruer & Simpson, 266 Tehama St., San Francisco.

PLUMBING CONTRACTORS
Alex Coleman, 706 Ellis St., San Francisco.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Doell, Carl T., 467 21st St., Oakland.
Hateley & Hateley, Mitau Bldg., Sacramento.
Scott Co., Inc., 243 Minna St., San Francisco.
Wm. F. Wilson Co., 328 Mason St., San Francisco.
W. H. Picard, 5656 College Ave., Oakland.
Luppen, Hawley & Thing, 906 7th St., Sacramento.

PLUMBING FIXTURES, MATERIALS, ETC.
California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
Crane Co., San Francisco, Oakland, Los Angeles.
Gilley-Schmid Company, 198 Otis St., San Francisco.
Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

H. Mueller Manufacturing Company, 635 Mission St., San Francisco.
Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
J. L. Mott Iron Works, D. H. Gulick, selling agent, 553 Mission St., San Francisco.
Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
Standard Metals Mfg. Co., 1300 N. Main St., Los Angeles; 216 Hobart Bldg., San Francisco.
Victory Mfg. Co., 423 Monadnock Bldg., San Francisco.
West Coast Porcelain Manufacturers, Oceanic Bldg., San Francisco.

POLES AND PILING
Santa Fe Lumber Co., 16 California St., San Francisco.

POWER TRANSMITTING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PRELIMINARY ESTIMATES, VALUATIONS
Arthur Priddle, Williams Bldg., Third and Mission Sts., San Francisco.

PUMPS
Chicago Pump Co., represented by Garnett, Young & Co., 612 Howard St., San Francisco.
California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.
Simonds Machinery Co., 117 New Montgomery St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

PUMPS—HAND OR POWER
Pelton Waterwheel Co., 2022 Harrison St., San Francisco.
S. F. Bowser & Co., Inc., 612 Howard St., San Francisco.
S. T. Johnson Co., 1337 Mission St., San Francisco.
Wayne Tank & Pump Co., 631 Howard St., San Francisco; 830 S. Los Angeles St., Los Angeles.

QUANTITY SURVEYOR FOR CONTRACTORS
Arthur Priddle, Williams Bldg., Third and Mission Sts., San Francisco.

RADIATORS—ELECTRIC STEAM
William J. Schwerin, 217 Rialto Bldg., San Francisco.

REINFORCING STEEL
Edward L. Soule, Rialto Bldg., San Francisco.
Badt-Falk & Co., Call Bldg., San Francisco.
Judson Iron Works, San Francisco and Oakland.
Gunn, Carle & Co., Inc., 444 Market St., San Francisco.
Pacific Coast Steel Co., Rialto Bldg., San Francisco.
Truscon Steel Co., 527-10th St., San Francisco.

RERIGERATORS
McCray Refrigerator Company San Francisco office, 765 Mission St.

ROCK AND GRAVEL
Coast Rock & Gravel Co., Call Bldg., San Francisco.

ROOFING AND ROOFING MATERIALS
"Malthoid" and "Ruberoid," also "Pabco" ten and twenty year roofs, manufactured by the Paraffine Companies, Inc., San Francisco.
United Materials Co., Sharon Bldg., San Francisco.
H. H. Robertson Co., Hobart Bldg., San Francisco.
Jones Brothers Asbestos Supply Co., 512 Second St., San Francisco.
Johns-Manville Inc., of California, 500 Post St., San Francisco.

RUBBER TILING
New York Belting and Packing Company, 518 Mission St., San Francisco.

RUGS & CARPETS
Edw. J. Margett, 61 Ellis St., San Francisco.
W. & J. Sloane, 216 Sutter St., San Francisco.

SAFETY TREADS
Pacific Materials Co., 525 Market St., San Francisco.

SAND
Coast Rock & Gravel Co., Call Bldg., San Francisco.
Dele Monte White Sand, Del Monte Properties Co., 401 Crocker Bldg., San Francisco.

SASH AND CABLE CHAINS
Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, San Francisco and Los Angeles.

SAFES AND VAULTS
Hermann Safe Company, 216 Fremont St., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles, and 17th and Mission Sts., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The Paraffine Companies, Inc., 34 First St., San Francisco.

SHEET METAL WORK
Forderer Cornice Works, 269 Potrero Ave., San Francisco.
Griffin Sheet Metal Works, Fresno, Cal.
Pacific Heating Company, Second and Grove Sts., Oakland.
U. S. Metal Products Co., 330-10th St., San Francisco.
Fire Protection Products Co., 3117-20th St., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

SHINGLE STAINS
Bass-Hueter Paint Company, all principal Coast cities.

Cabot's Creosote Stains, sold by Pacific Bldg., Materials Co., 525 Market St., San Francisco.

Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SHINGLES—COMPOSITION, UNIT AND STRIP
The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

SHUTTERS—ROLLING, FIRE, STEEL, WOOD
J. G. Wilson Corp, 621 North Broadway, Los Angeles.

SINKS—COMPOSITION
Petrium Sanitary Sink Co., Fifth and Page Sts., Berkeley.

SKYLIGHTS
H. H. Robertson Co., 1007 Hobart Bldg., San Francisco.

STEEL HEATING BOILERS
Kewanee Boiler, factory branch, Exposition Building, San Francisco.

STEEL TANKS, PIPE, ETC.
Ocean Shore Iron Works, 55 Eighth St., San Francisco.

S. T. Johnson Co., 1337 Mission St., San Francisco.

Western Pipe and Steel Co., 444 Market street, San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
Judson Mfg. Co., 817-821 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Ralston Iron Works, 20th and Indiana streets. San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Union Construction Co., 604 Mission street, San Francisco and Key Route Fell, Oakland.
Western Iron Works, 141 Beale St., San Francisco.

STEEL ROLLING DOORS
Kinnear Rolling Steel Doors, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco.
Wilson Rolling Steel Doors, the J. G. Wilson Corporation, 621 North Broadway, Los Angeles and Waterhouse Wilcox Co., 523 Market St., San Francisco.

STEEL SASH
Bayley-Springfield solid steel sash, sold by Pacific Materials Co., 525 Market St., San Francisco.
"Lupton" steel sash, Waterhouse-Wilcox Co., agts., San Francisco, Los Angeles and San Diego.
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich. Direct factory sales office, Foxcroft Bldg., San Francisco.
Michel & Pfeffer Iron Works, 1415 Harrison street, San Francisco.
U. S. Metal Products Company, 330 Tenth St., San Francisco.
Truscon Steel Company, 527 Tenth street, San Francisco.

STORE FRONTS
Zouri Safety Sash Bars—Cobbledick-Kibbe Glass Company, 175 Jessie St.. San Francisco.

STUCCO AND STUCCO BASE
John R. Steffens-Lomax Co., 951 Monadnock Bldg., San Francisco.

STUDDING—FIREPROOF STEEL
Steel Studding Company, 1216 Folsom St., San Francisco.

SWITCHES AND SWITCHBOARDS
Safety Electric Co., 59 Columbia Square, San Francisco.
Western Electric Safety Switch Co., Inc., 247 Minna street, San Francisco.
Meyer's Safety Switch Co., 575 Howard Street, San Francisco.

TELEPHONE SYSTEMS
"Connecticut" Intercommunicating Telephones, Myers & Schwartz, 71 New Montgomery St., San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market street, San Francisco.
Rucker-Fuller Desk Co., 677 Mission street, San Francisco.

THERMOSTATS FOR HEAT REGULATION
Johnson Service, Rialto Bldg., San Francisco.

TILE FOR ROOFS, MANTELS, ETC.
Cannon & Co., Sacramento; and 77 O'Farrell St. San Francisco.
Gladding, McBean & Co., Crocker Bldg., San Francisco.
S. & S. Tile Co., 4th and Carrie streets, San Jose.
United Materials Co., Sharon Bldg., San Francisco.

ARCHITECTS' SPECIFICATION INDEX—Continued

TILE—STONE—CEMENT
National Stone Tile Company, Inc., Merchants National Bank Building, San Francisco.

TRANSMISSION MACHINERY
Meese & Gottfried Co., San Francisco, Los Angeles, Portland and Seattle.

TRAVELING CRANES
Cyclops Iron Works, 837 Folsom St., San Francisco.

VALVES—PIPES AND FITTINGS
Crane Radiator Valves, manufactured by Crane Co., Second and Brannan Sts., San Francisco.
Grinnell Co., 453 Mission St., San Francisco.
O. M. Simmons Co., 115 Mission St., San Francisco.
H. Mueller Mfg. Co., 635 Mission street, San Francisco.
Kennedy Valve Mfg. Co., 23-25 Minna street, San Francisco.
Victory Manufacturing Co., Monadnock building, San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
Bass-Hueter Paint Company, Mission, near 4th street, San Francisco, and all principal Coast cities.
W. P. Fuller Co., all principal Coast cities.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, 55 Stevenson St., San Francisco.
Supreme Varnish and Enamel Co., Sharon Bldg., San Francisco.

VENTILATORS
H. H. Robertson Co., 1007 Hobart Bldg., San Francisco.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.
West Coast Porcelain Manufacturers, 424 Oceanic Bldg., San Francisco.

WALL BEDS—SEATS, ETC. (See Beds)

WALL BOARD
"Amiwud" and "Pabco," manufactured by The Paraffine Companies, Inc., San Francisco, Los Angeles, Portland and Seattle.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.

WALL PAPER AND DRAPERIES
The Tormey Co., 681 Geary St., San Francisco.
W. & J. Sloane, 216-228 Sutter St., San Francisco.
Uhl Bros., San Francisco.

WATERPROOFING (see Damp-proofing)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.
Smith-Booth-Usher Co., San Francisco and Los Angeles.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL
"Gold Seal," manufactured and sold by Bass-Hueter Paint Co. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 55 Stevenson St., San Francisco.
The Paraffine Companies, Inc., 34 First St., San Francisco, Los Angeles, Portland and Seattle.

WINDOW SASH CHAIN
The Smith & Egge Mfg. Co., Bridgeport, Conn. Coast agents, Rawlins & Smith, 507 Mission street, San Francisco, and I. W. Hellman Bldg., Los Angeles.

WINDOW SHADES
W. & J. Sloane, 216 Sutter street, San Francisco.
D. N. & E. Walter, 562 Mission street, San Francisco.

WINDOWS, REVERSIBLE, CASEMENT, ETC.
Crittall Casement Window Co., Detroit; Waterhouse & Wilcox, San Francisco, representatives.
Hauser Window Co., 157 Minna St., San Francisco.
"Lupton's" Factory, Counterbalanced and Schoolhouse Sash, Waterhouse Wilcox Co., Agents, San Francisco, Los Angeles and San Diego.
J. G. Wilson Corporation, 621 N. Broadway, Los Angeles; Waterhouse-Wilcox Co., Underwood Bldg., San Francisco.

WIRE FENCE
Standard Fence Co., 245 Market street, San Francisco; and 310 12th street, Oakland. .....

Stanford, California, residence of Mr. Herbert Hoover, Secretary of Commerce. Medusa Stainless White Cement was used in the exterior stucco, and on the inside for shower baths, setting tile, etc. Architect, Mr. A. B. Clark of Stanford University, Calif.

The Residence of Mr. Herbert Hoover

SECRETARY Hoover's California residence is a fitting tribute to the structural possibilities of Medusa White Cement Stucco.

Specifying Medusa Waterproofed White Cement means the safeguarding of ornamental concrete work against unsightly streaking and discoloration. Such work, if properly prepared and applied, will retain its original texture and color indefinitely, and may readily be scrubbed free from any surface deposits of dust or soot.

Medusa Waterproofing in concrete, added as an integral part of the cement, lines the tubes or pores throughout the mass with a water-repellent film that resists dampness *permanently*. Best results can be had by specifying Medusa *Waterproofed* Cements, either White or Gray. *We are sole manufacturers of Waterproofed White Cement—ask for booklets.*

Medusa White Cement and Medusa Waterproofing are carried in stock and sold by leading building-supply dealers in California, Oregon and Washington.

THE SANDUSKY CEMENT COMPANY
Department P Cleveland, Ohio

Manufacturers of Medusa Stainless White Cement (Plain and Waterproofed); Medusa Gray Cement (Plain and Waterproofed); and Medusa Waterproofing (Powder or Paste).

MEDUSA

WHITE CEMENT

Waterproofed or Plain

DETAIL OF TOWER, FREMONT SCHOOL, 24th and N Sts., Sacramento
Hemmings, Petersen, Hudnutt, Architects; Dean & Dean, Designers and Successors
K. E. Parker Co., General Contractors; White & Gloor, Masonry Contractors

TRULY a wonderful example of what an interested manufacturer may accomplish in collaboration with an architect. Those who have seen this marvelous color blend in Roman brick, one and one-half by twelve by three and one-half inches, have unhesitatingly pronounced it an advanced step in California craftsmanship and color. Here we daringly combined variegated buffs and browns with deep wine colors, all of rough texture. Joints were raked and brick laid as without tools. The composite color and texture scintillate with life, gripping every beholder where he lives.

Wouldn't you like to secure some new colors and ideas in brick work?

You are invited to visit our exhibit at 77 O'Farrell Street, San Francisco, after July First.

CANNON & COMPANY

Executive Offices and Works, Sacramento, Calif. 77 O'Farrell St., San Francisco

HUBBELL

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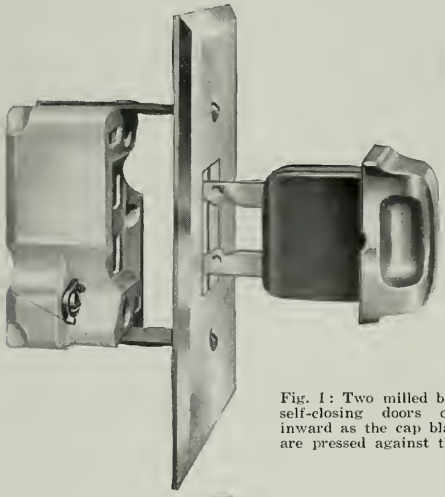
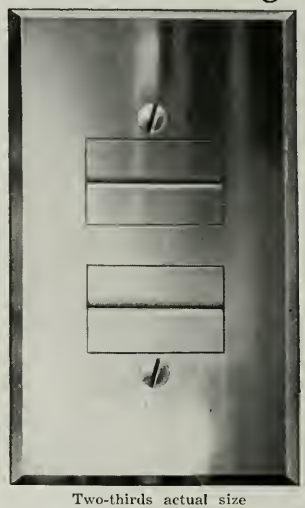


Fig. 1: Two milled brass self-closing doors open inward as the cap blades are pressed against them



Two-thirds actual size
Duplex FLUSH DOOR Receptacle No. 6755, with plate No. 6756—assembled.

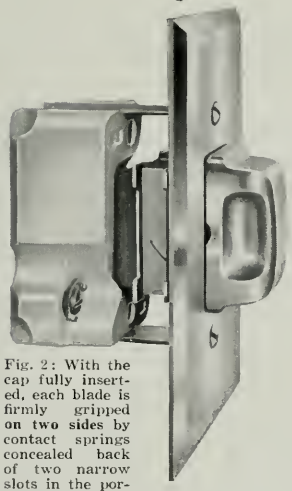


Fig. 2: With the cap fully inserted, each blade is firmly gripped **on two sides** by contact springs concealed back of two narrow slots in the porcelain body. Weak connections are impossible.
When the cap is withdrawn, the doors automatically close, flush with the plate.

THIS new electrical outlet for fine buildings has been designed to meet Architect's requirements for a flush receptacle with the mechanism **wholly concealed from view.**

Electrical contacts can be reached only by the blades of each cap.

These FLUSH DOOR RECEPTACLES are furnished complete with brass-covered or all-composition caps. Brass plates are of standard size, in any finish desired. Receptacles bodies fit standard outlet boxes.

HARVEY HUBBELL INC
ELECTRICAL SPECIALTIES
BRIDGEPORT CONN. U.S.A. 2265-U

A BULLETIN containing full information regarding our Electrical Wiring Devices, is in course of preparation. We will gladly mail a copy free to any architect requesting.

ELECTRICAL SPECIALTIES

THE ARCHITECT AND ENGINEER

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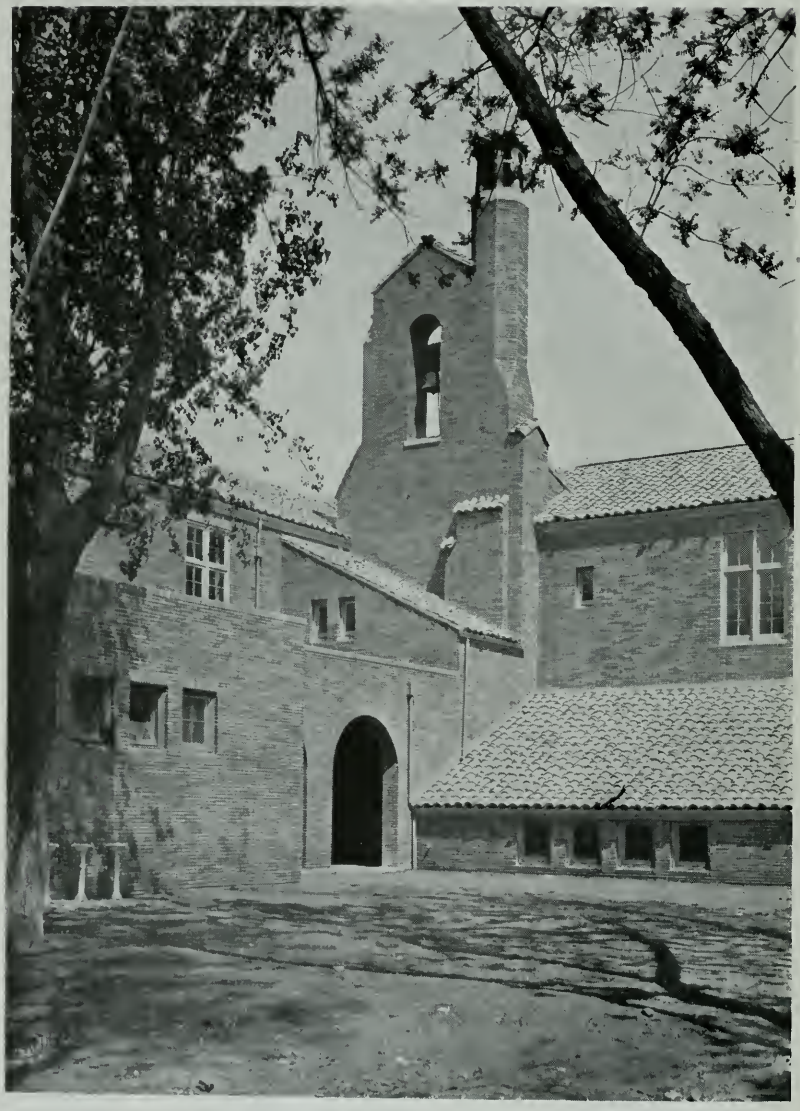

FREMONT SCHOOL, SACRAMENTO, CALIFORNIA
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors

THE
ARCHITECT
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JUNE
1922

Vol. LXIX
No. 3

Recent Work by Dean and Dean, Architects

By IRVING F. MORROW*

SACRAMENTO'S school building program is in full swing, and a grateful sight it is, as one passes about the city, to encounter, at frequent turns, structures recently finished or still building. The sound, straightforward construction of the incomplete ones, no less than the beauty of design and finish of those completed, is genuinely refreshing to the architectural pilgrim. Many a community of equal size to the Capital, and some larger ones, have erected schools which are less well planned, less well designed, and less well built. The greater part of the recent building program was originally assigned to Messrs. Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission. The actual design of the buildings is to be attributed to Messrs. Dean & Dean, who have since succeeded to the management of the work. The city is acquiring buildings which are from every point of view of commendably and consistently high quality.

All of the buildings (as far as I am aware) are of masonry construction—brick or hollow tile, in combination with concrete frames, concrete floors, tile roofs, and steel trusses over long spans, as in auditoriums, etc. All corridor walls to a height around the door heads are built of a buff hollow tile, left unfinished. The tile buildings have been plastered, with textures reminiscent of the Spanish plaster work so beloved of all who have felt the charm of the early California adobes. The brick buildings exhibit, from school to school, bricks of a delightful variety in texture, color, and form. This material is a local product, from the kilns of Cannon & Co., and no small part of the charm of the buildings is attributable to its beauty, and to the reserved and straightforward manner in which it has been used.

The planning of the buildings is clean, direct, logical. Standardization has been adopted to a considerable degree—a policy toward which the architect is inclined to be unfavorably disposed. Theoretical objections are only too easy to state. Problems rarely present identical conditions and requirements. Every site insists on its own peculiarities of

*Architect, Member of the firm of Morrow & Garren, Architects, San Francisco.

size, shape, grades, outlook, exposure, etc. Every building suggests, if it does not press, particular demands of its own which vary, however slightly, from those of others of its type. Would it not seem, therefore, that identical solutions must at some points allow lapses or inconsistencies?

Accepting standardization as a policy, one can not fail to admire the freedom with which the architects have moved within their standard. It has not stifled their spirit. Certain of the objections listed, of course, are eliminated to a large degree by the conditions of the problem. In Sacramento sites simply do not have peculiarities of size, shape, grade, outlook, and exposure. Possibly the City Engineer could adduce data proving the incorrectness of the statements; but surely

HOUSE OF MR. MORGAN E. La RUE, SACRAMENTO
Dean & Dean, Architects

one's impression is that all streets run in one of two directions at right angles one to the other, that all blocks are of equal size, and that the entire city and surroundings have about as much variation in grade as is admissable in a billard table. Outlooks are likewise non-existent, save temporarily into fields on the present outskirts of the town, or into trees on the older streets. (It may be said in passing that these glorious elm and locust trees which arch over Sacramento's streets constitute a rare asset of beauty and comfort, and the tendency one notes to encroach upon them needlessly is nothing short of criminal). Under the circumstances, therefore, about the only peculiarity possible to a site is that it may occupy less than an entire block. A plan which is adapted to one site in the city is more than likely to fit any other equally well.

The varying plan requirements from school to school have been adroitely met by minor eliminations from or additions to the typical plan. Each building has likewise been given a physiognomy of its own by special details, brick sizes and colors, and elements of composition.

Here, however, one may note that the moment strict uniformity is abandoned a standard ceases to be a standard, and such advantages as standardization possessess promptly disappear. One may well question, therefore just what purpose has been served in the present instance by the adoption of the policy. One interesting and rather subtle result there is none the less. A large number of buildings is being built; buildings which, although scattered about the city, in reality are parts of one large program. It is a pleasant idea that, while each conserves its own touch of individuality, they should all be recognizable as being of the large program.

The simplicity and restraint which characterize every design are admirable. I have already alluded to the straightforward handling of

SUTTER LAWN TENNIS CLUB, SACRAMENTO
Dean & Dean, Architects

the brick. Equally straightforward are both composition and detailing. Masses are simple, but never without grace. Fenestration is both logical and interesting—a combination only too rarely met in school house design. Rooms have been made amply light without depriving them entirely of walls. I do not know if the approved scientific formulae as to the area of glass have been embodied; but in any case the effect, both inside and out, is that the fenestration has been worked out by common sense and artistic sensibility rather than with a sixteen inch gun.. Admirable scale is maintained. Poise is never lost. Dignity and intimate human charm are reconciled. The sense of solid achievement with an entire absence of striving gives the buildings an atmosphere of genuine importance. What is more, they "belong"; that is to say, they are entirely appropriate to their situations. Just what constitutes appropriateness in a town not three quarters of a century old, in a country of shifting and conflicting social traditions, may be an uncertain matter,

possibly one more than usually subjective. If one were pinned down to a definition it might be easier to proceed negatively, eliminating the inappropriate. It would undoubtedly be the part of wisdom not to attempt to restrict the appropriate to any single type of design. Certain it is that the new Sacramento schools impress me as entirely appropriate to their situations; and this sympathy, together with the satisfying solidity of their construction, gives them an air of having long been where they stand. The impression will enhance with age, for the buildings will wear and weather well. It is architecture which will require neither painting, washing, nor sand-blasting (even when a convention invades the city).

Those buildings which are old enough for plant growth to have begun to count have been helped to take their places by the landscape work of Mr. Frederick N. Evans, Superintendent of Parks of Sacramento.

HOUSES IN SOUTH CURTIS OAKS, SACRAMENTO
Dean & Dean, Architects

The domestic architecture of Messrs. Dean and Dean is second to the school work in no respect other than in size. The designs are equally individual and the execution equally sensitive. The house of Mr. George H. Cutter in particular would be an asset to any city.

The following notes on the Sacramento schools have been furnished by the architects:

The total amount of the bond issue which was voted on October 18th, 1919, for elementary schools was $2,304,000. Of this about $500,000.00 was expended for sites, overhead, etc., leaving a balance of approximately $1,800,000 for buildings. The work of the Commission covered the recommendation as to location and size of sites and sizes of the buildings. Each building was then planned, insofar as was practicable, for an ultimate maximum size building which would accommodate twelve hundred pupils, the number that the District would probably have when it was entirely built up. The building that was then erected was a portion of this complete plan and all additions made in the future will work toward the maximum building as laid out.

The construction used in all of the new schools is one that is practically fireproof, the frame and floor slabs being of concrete with either brick or hollow tile and plaster exterior walls. The roofs are all of tile. The class rooms have all been arranged so as to have east light with the administrative and special rooms to the north.

Following is a list of the schools which have been erected, together with cost and a summary of accommodations provided:

Elmhurst School—$97,108; seven classrooms, principal's office and teachers' suite.

El Dorado School—$66,715; five classrooms, principals office and teachers' suite.

Fremont School—$202,403; thirteen classrooms, four special rooms, principal's office and teachers' suite.

Jefferson School—$136,167; ten classrooms, principal's office and teachers' suite.

Newton Booth School—$177,990; thirteen classrooms, four special rooms, principal's office and teachers' suite.

Franklin School—$124,320; eleven classrooms, principal's office and teachers' suite.

East Sacramento School—$239,060; nine classrooms, five special rooms, auditorium, principal's office, teachers' suite, first aid and dental rooms.

HOUSES IN SOUTH CURTIS OAKS, SACRAMENTO
Dean & Dean, Architects

Bret Harte School—$184,600; eleven classrooms, six special rooms, principal's office and teachers' suite.

Leland Stanford School—$225,499; eight classrooms, eight special rooms, auditorium, principal's office, teachers' suite and first aid room.

Highland Park School—$135,561; eleven classrooms, four special rooms, principal's office, teachers' suite and first aid room.

McKinley School—$56,367; six classrooms.

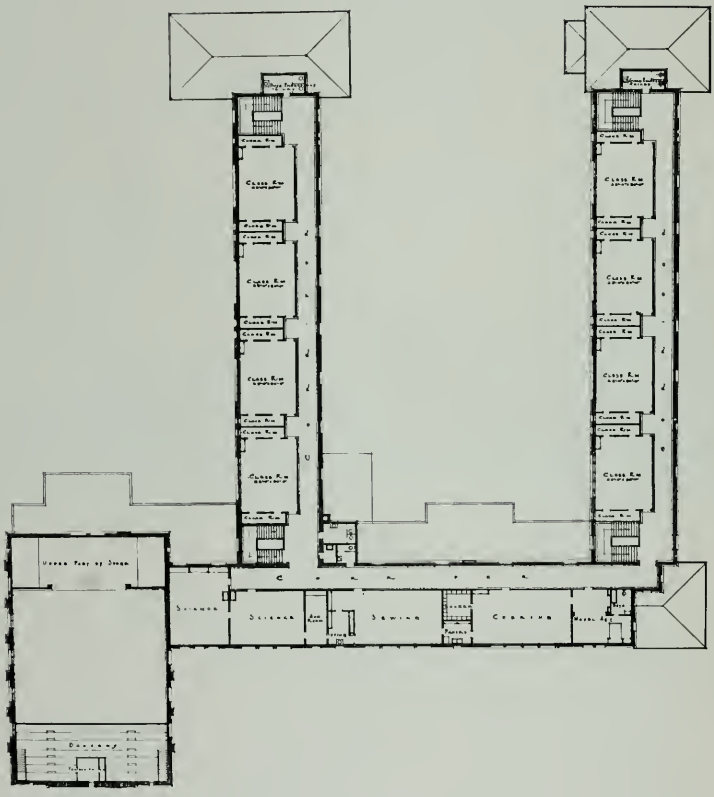
Marshall School (additions and alterations)—$32,232; four classrooms.

Lincoln School (additions and alterations)—$36,853; four classrooms.

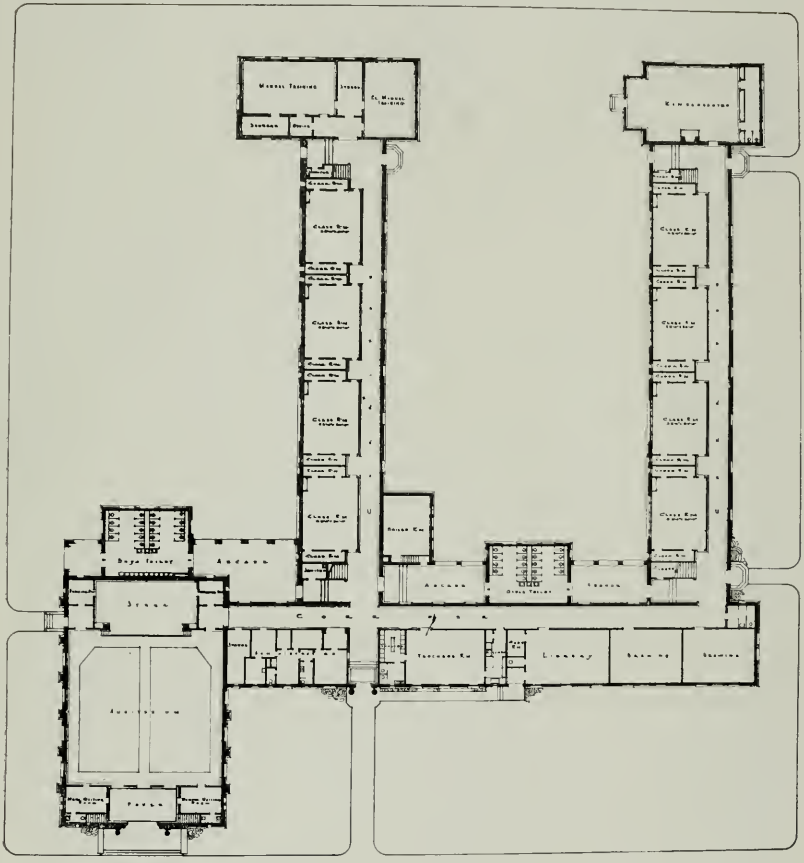
* * * *

Elected President of Institute

The annual convention of the American Institute of Architects, held in Chicago the forepart of this month, honored San Francisco in particular and the Pacific Coast in general, by electing Mr. William B. Faville president for the year 1922-23. Mr. Faville was present and accepted the honor with characteristic modesty. He is junior member of the firm of Bliss & Faville, Architects of San Francisco.



TYPICAL SECOND FLOOR PLAN, ELEMENTARY SCHOOL (Showing Completed School)
SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors



TYPICAL FIRST FLOOR PLAN ELEMENTARY SCHOOL (Showing Completed School)
SACRAMENTO
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FREMONT SCHOOL, SACRAMENTO, CALIFORNIA
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
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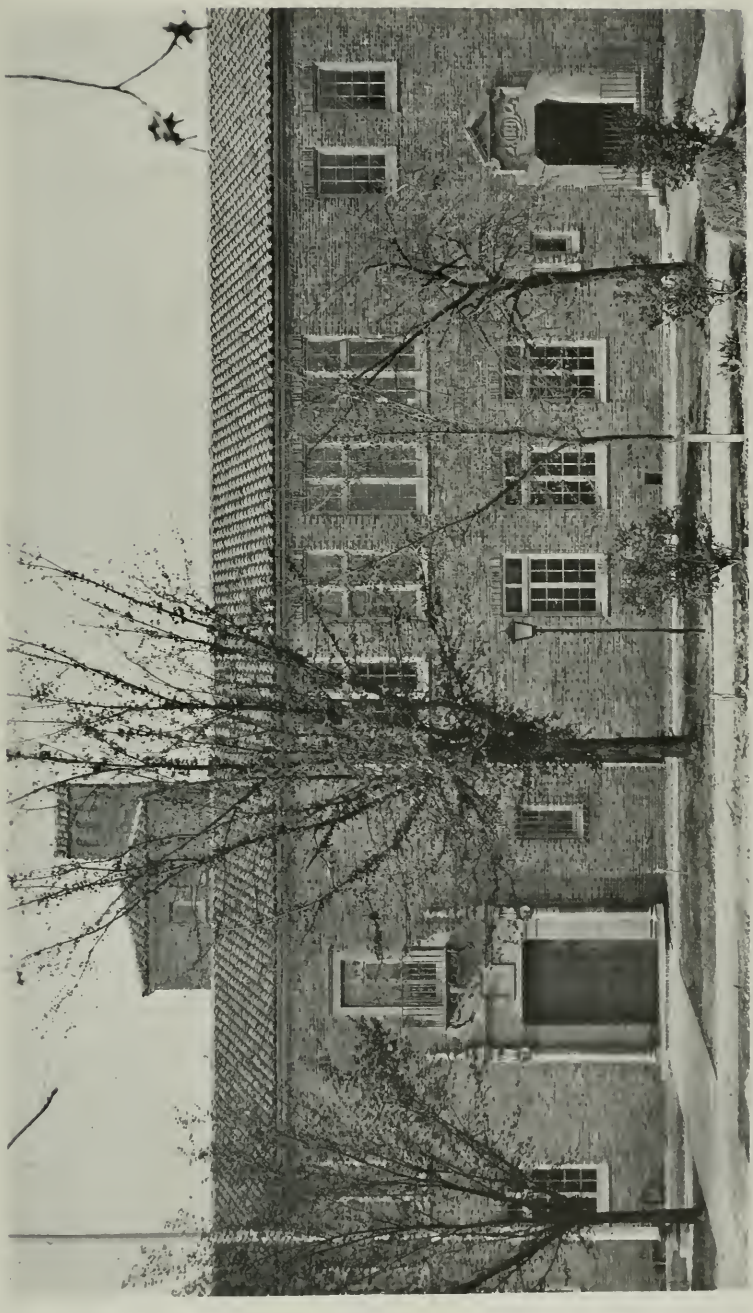

NEWTON BOOTH SCHOOL, SACRAMENTO, CALIFORNIA
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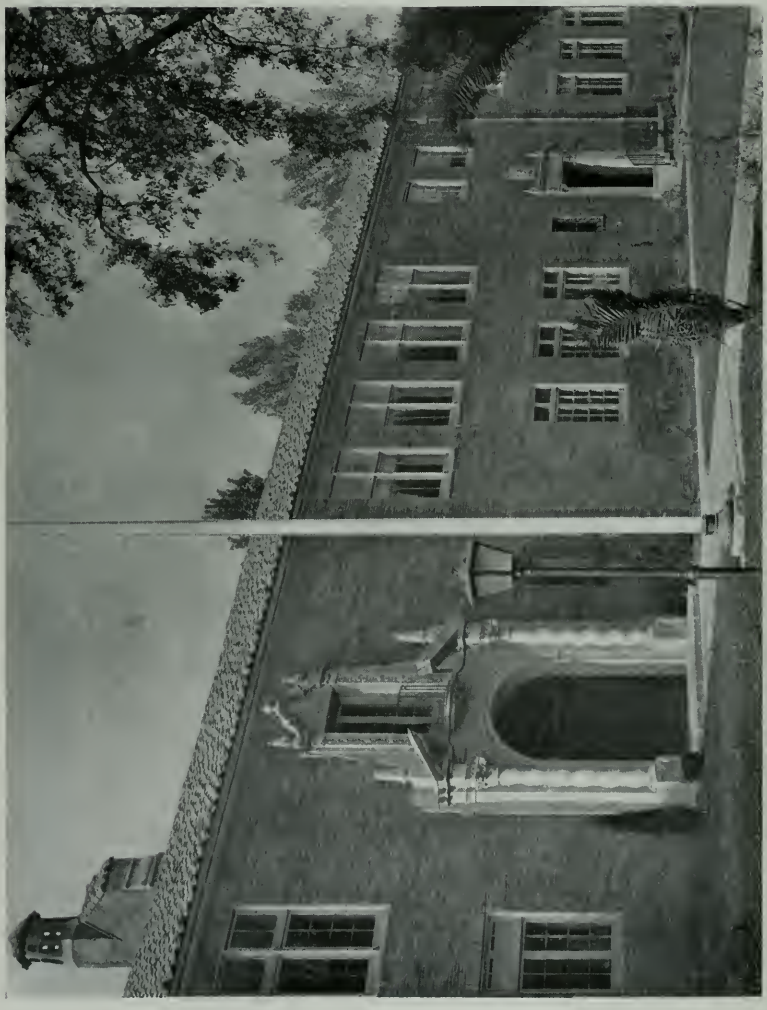
ENTRANCE DETAIL, NEWTON BOOTH SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors

ENTRANCE DETAIL, FREMONT SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors



FREMONT SCHOOL, SACRAMENTO, CALIFORNIA
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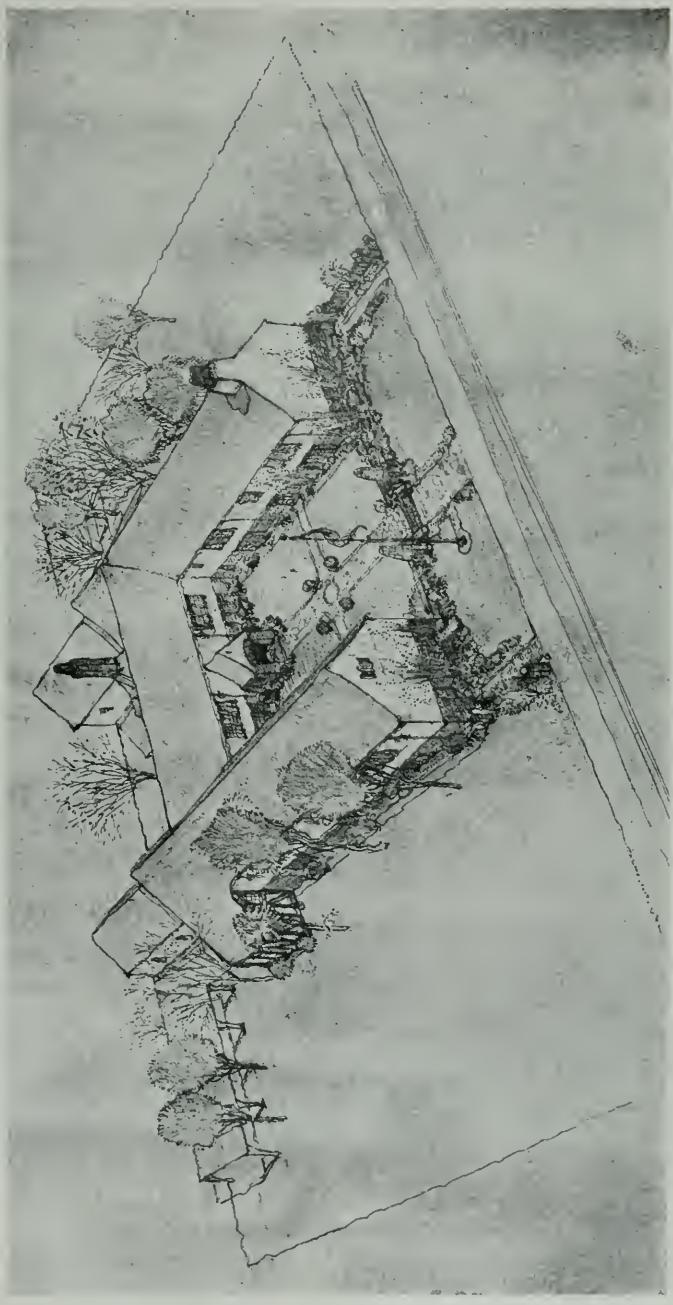
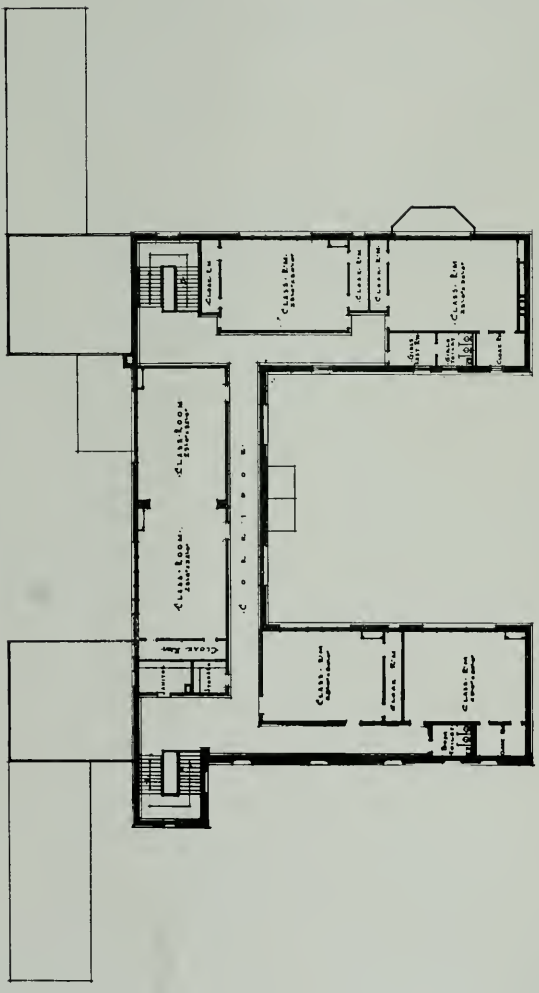
ADDITION TO MARSHALL SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors

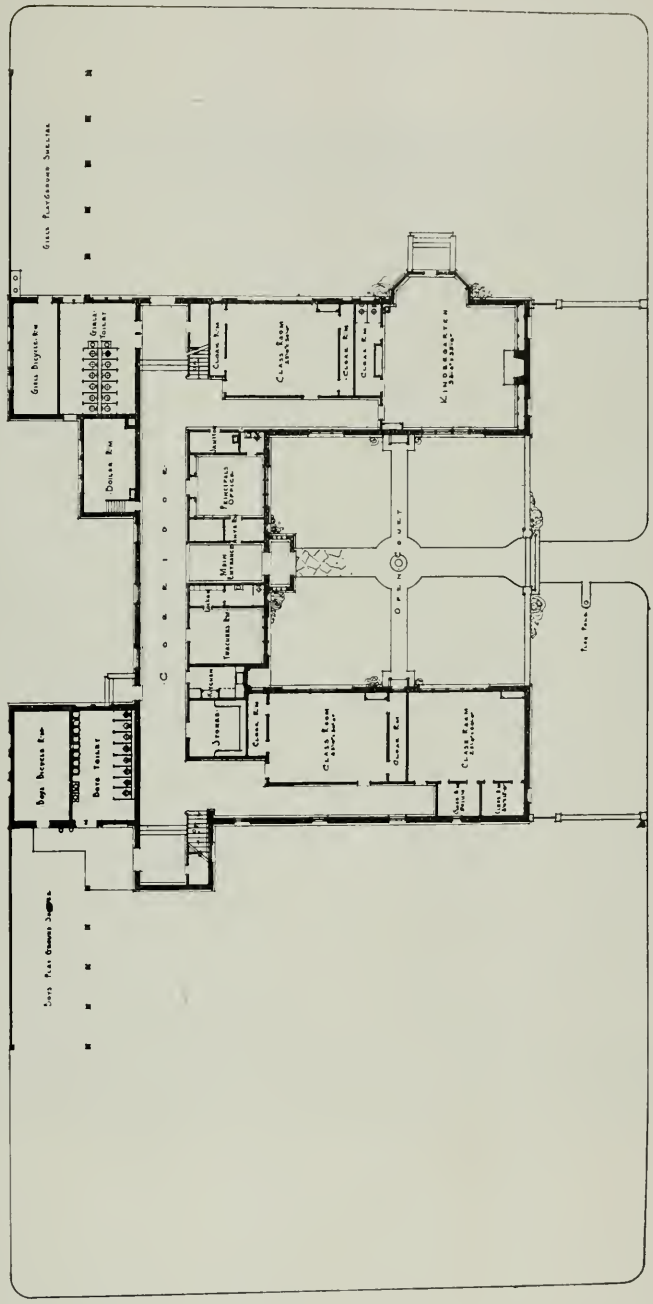


ORIGINAL PERSPECTIVE, JEFFERSON SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors

JEFFERSON SCHOOL, SACRAMENTO, CALIFORNIA
Hemmings, Petersen, Hudnut, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors



SECOND FLOOR PLAN, JEFFERSON SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors



FIRST FLOOR PLAN, JEFFERSON SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors

ENTRANCE DETAIL, JEFFERSON SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors

DONNER SCHOOL, SACRAMENTO, CALIFORNIA
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
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DONNER SCHOOL, SACRAMENTO, CALIFORNIA
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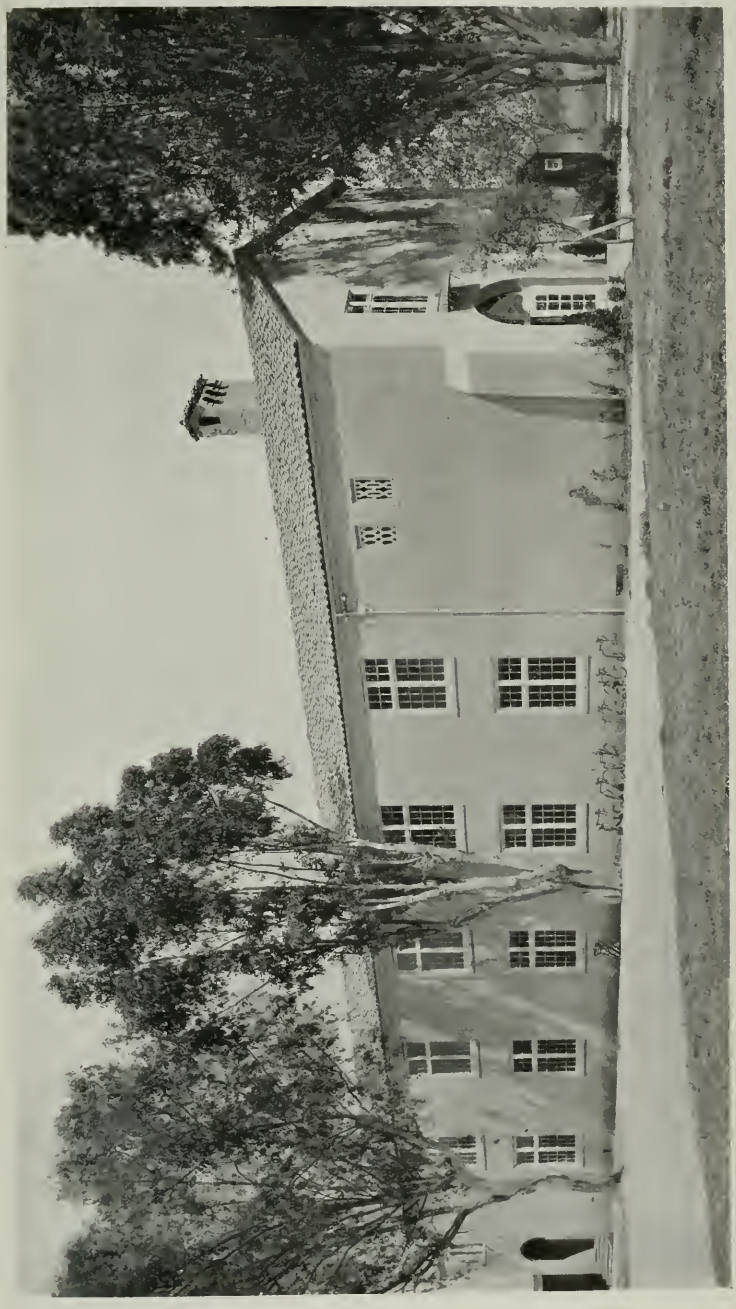

EL DORADO SCHOOL, SACRAMENTO, CALIFORNIA
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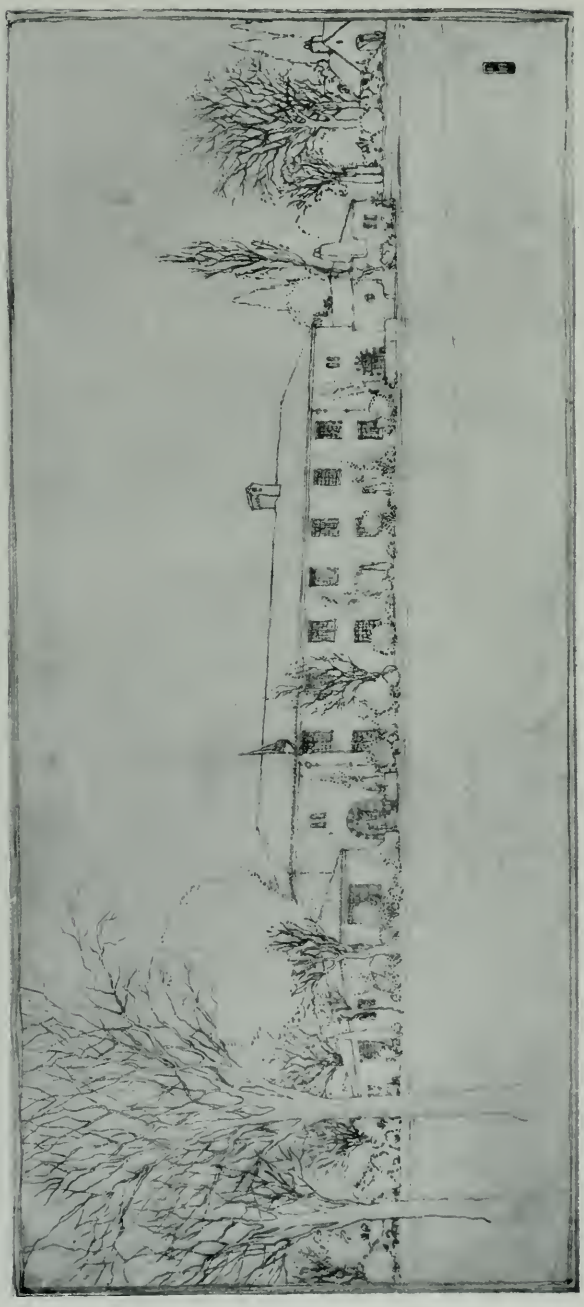
Dean & Dean, Architects, Designers and Successors



HIGHLAND PARK SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors

LELAND STANFORD SCHOOL, SACRAMENTO
Hemmings, Petersen, Hudnutt, Inc., Architectural and Engineering Commission
Dean & Dean, Architects, Designers and Successors

HOUSE OF MR. GEORGE H. CUTTER, SACRAMENTO
DEAN & DEAN
ARCHITECTS

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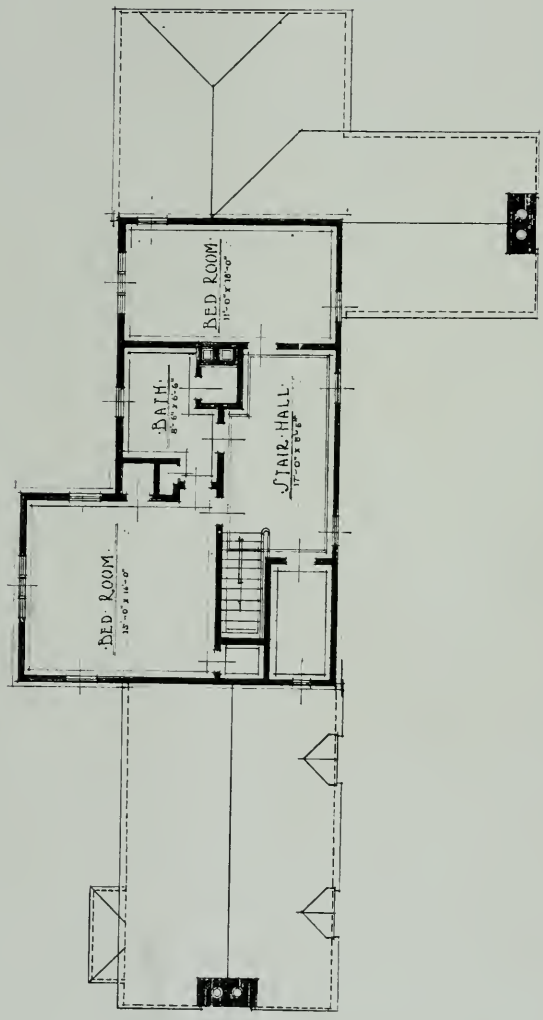
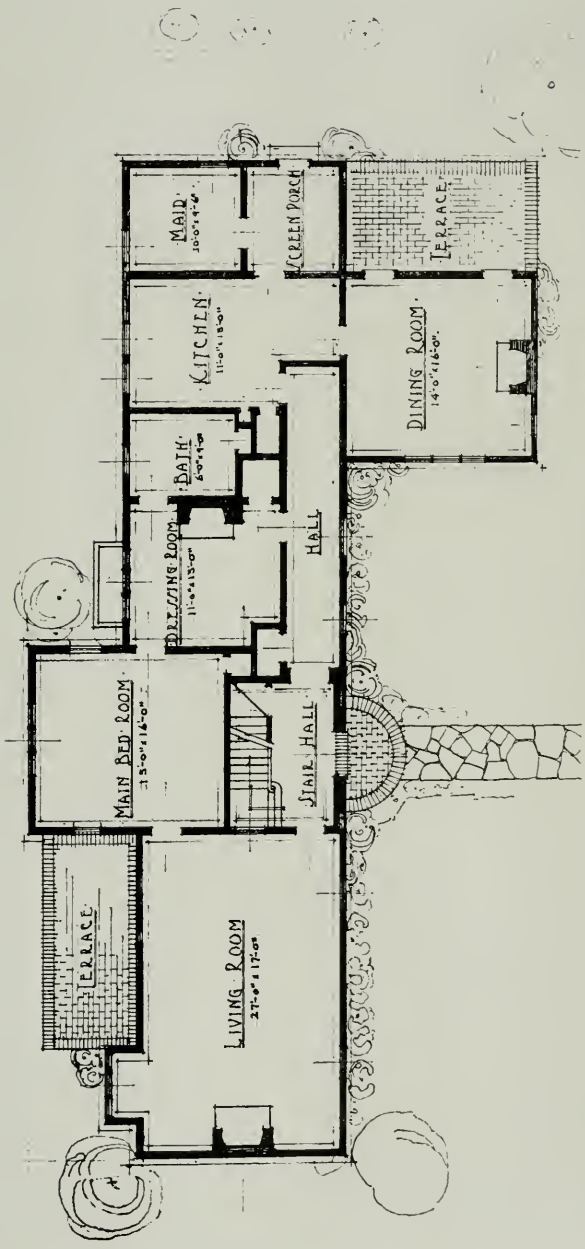
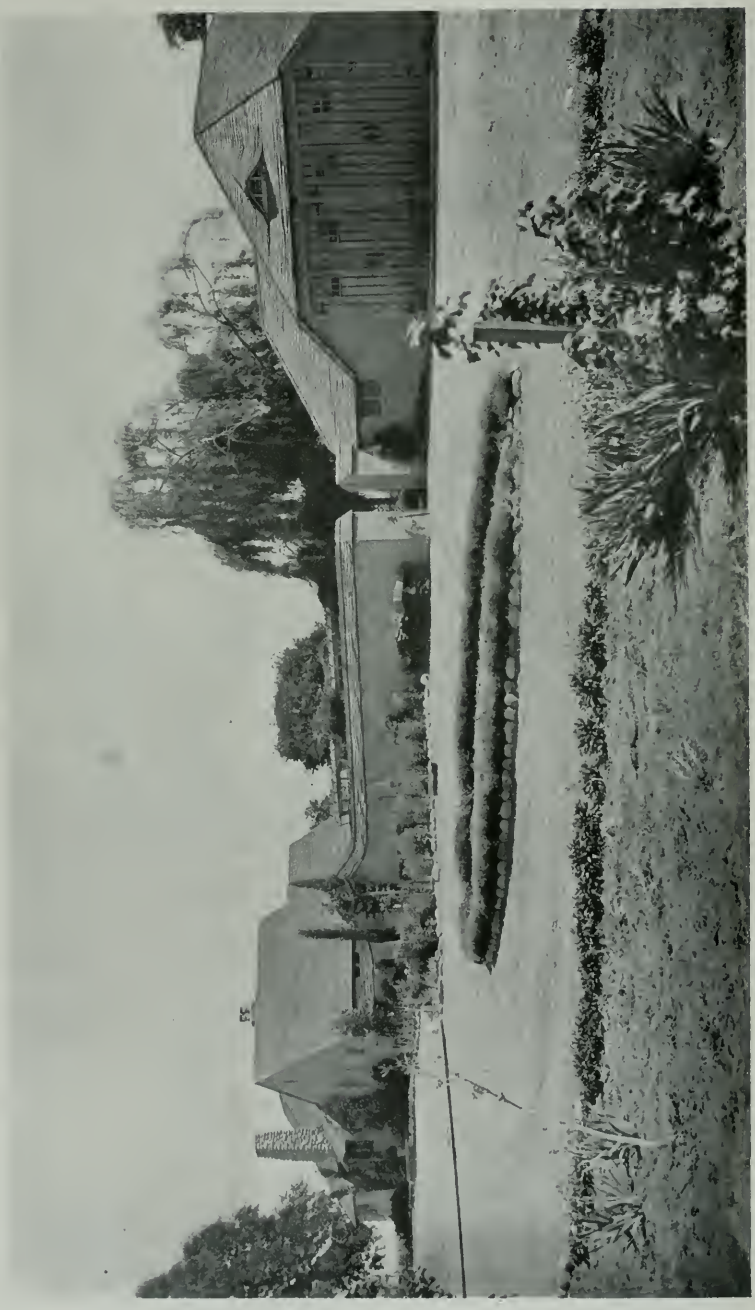
DEAN & DEAN
ARCHITECTS



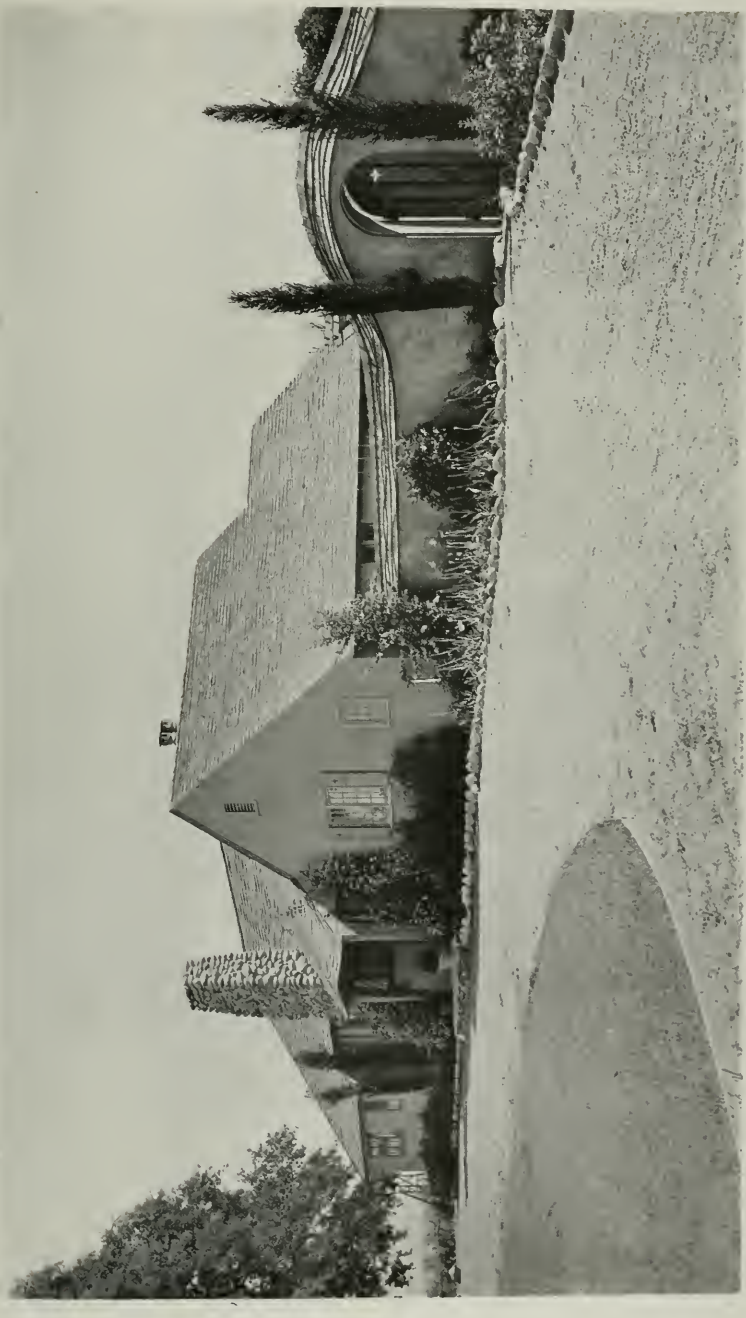
SECOND FLOOR PLAN, HOUSE OF MR. GEORGE H. CUTTER
SACRAMENTO, CAL. DEAN & DEAN, ARCHITECTS



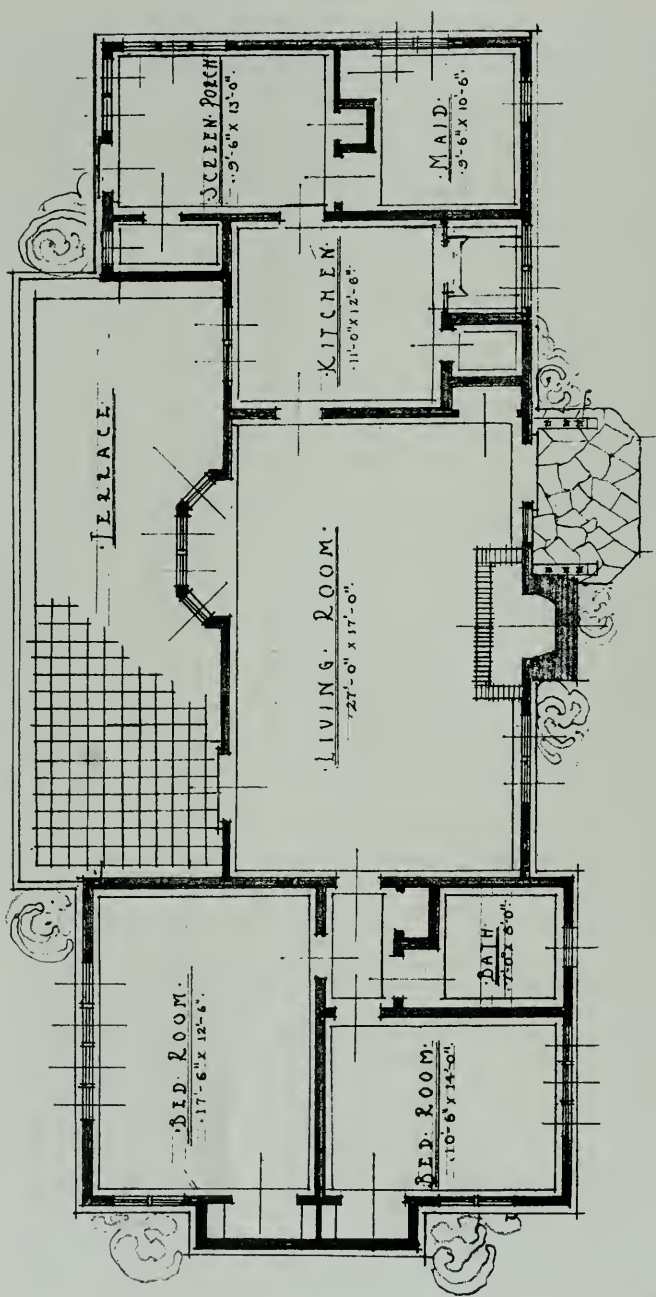
FIRST FLOOR PLAN, HOUSE OF MR. GEORGE H. CUTTER
SACRAMENTO
DEAN & DEAN, ARCHITECTS



"FAIRCLIFFE," HOUSE OF MR. WM. H. DEVLIN
SACRAMENTO DEAN & DEAN, ARCHITECTS



"FAIRCLIFFE," HOUSE OF MR. WM. H. DEVLIN
SACRAMENTO DEAN & DEAN, ARCHITECTS

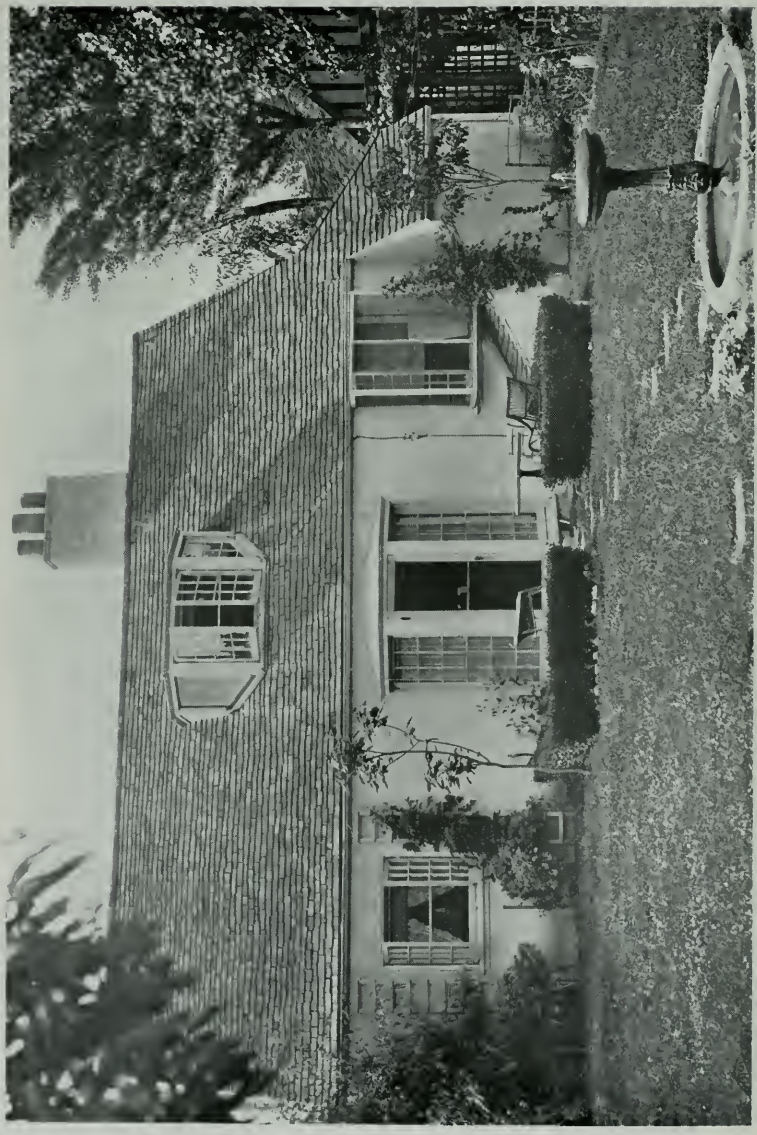


FLOOR PLAN, "FAIRCLIFFE," HOUSE OF MR. WM. H. DEVLIN
SACRAMENTO DEAN & DEAN, ARCHITECTS

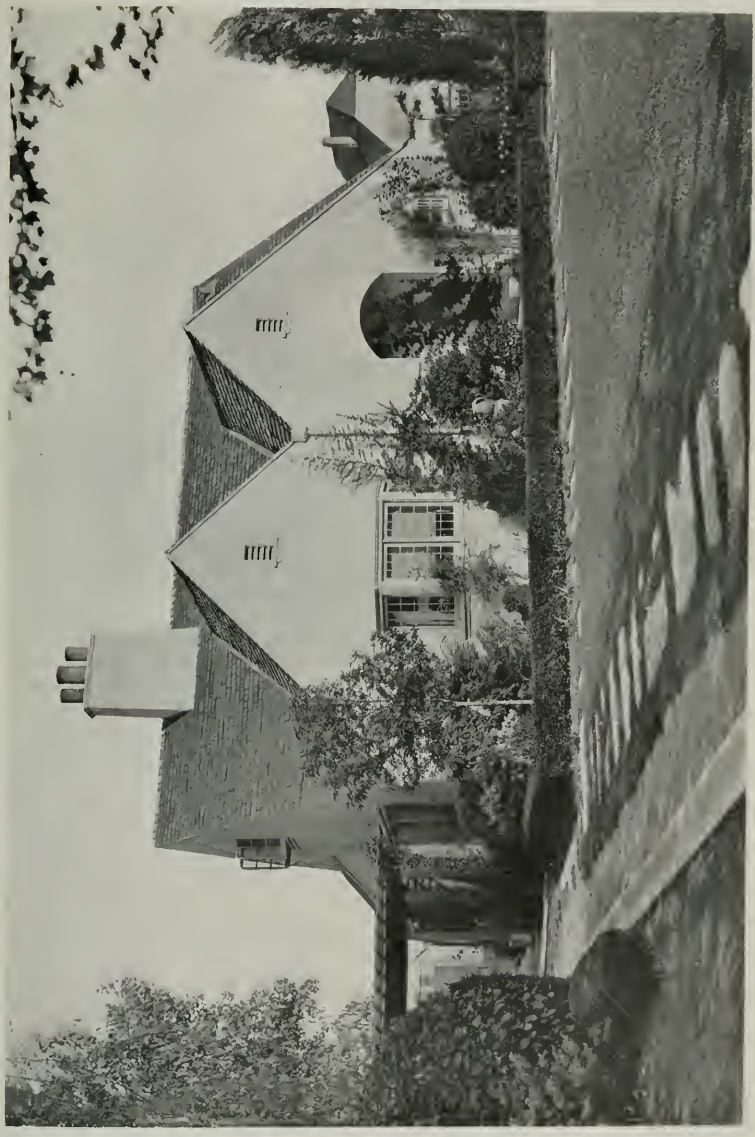
HOUSE OF MR. CURTIS H. CUTTER, SACRAMENTO
DEAN & DEAN
ARCHITECTS

HOUSE OF MR. CHAS. F. DEAN, SACRAMENTO
DEAN & DEAN ARCHITECTS

HOUSE OF MR. CHAS. F. DEAN, SACRAMENTO
DEAN & DEAN ARCHITECTS



HOUSE OF MR. A. E. SOMERVILLE
DEAN & DEAN ARCHITECTS



HOUSE OF MR. A. E. SOMERVILLE
DEAN & DEAN ARCHITECTS

Why So Many Structural Failures?

By ARTHUR H. HEMMLES, SACRAMENTO*

MOST people, when reading of the ninety-eight lives lost in the failure of the Knickerbocker Theatre, Washington, D. C., and of the seven lives lost in the roof failure of the Brooklyn Theatre, wondered why some definite measure of precaution had not been taken to prevent such structural failures.

It would seem that the public has a right to know, not only why these named structures failed, but also why failures occur at all, whether or not they can be avoided. If structural failures can be prevented, the public should know the reason why they are not avoided.

After such disasters have happened, a criminal or civil court usually fixes the responsibility; some person or persons are blamed, the owner or owners of the structure, however, are often made to pay damages to those whose providers were killed. The claims thus appeased, things go on just the same as ever before.

Unless all architects and structural engineers desiring to practice, are given a thorough technical examination and upon having shown their fitness, are certified and by law held responsible for the work which they design, and that each certified person will be required to report to a state authority, any irregularity or deviation from his design which he deems dangerous to life; unless such a measure is provided, we know that the building industries are not safely operated. Through the efforts of the medical profession, the peoples of all civilized races have been taught to be cautious in many ways, and now thousand of lives are saved, that would, without certain knowledge, given to us by the teachings of that profession, be lost.

The architectural and the structural engineering professions, can, by united effort, educate the public, so that certain systems and laws are adopted, which will prevent reoccurance of most of the structural failures.

It is true that an earnest effort has been made in some states to improve conditions by examining and certifying architects and engineers. There are many selfstyled "architects" and "engineers," however, who do not understand the sciences underlying the knowledge of good practice in architectural and structural engineering.

For proper co-operation and coordination it will be necessary to appoint examined structural engineers of high standing, to positions of chief inspector of buildings and plan examiners for all cities, that such inspectors and examiners be held accountable to the state.

In order to obtain the highest grade of men for these positions, it will be necessary to pay reasonably good salaries and to separate the examinations and appointments as far as possible from politics.

It will be necessry to revise our civil service systems, for at the present time, some of the underlings representing civil service commissions in some of our cities, counties and states, are conducting examinations and reporting on the same in a manner that indicates they are merely pliable plastic putty in the hands of designing politicians, who use the present civil service as a clearing house of their line-up of waiting heelers.

Many structures that fail are not faulty in their original design; many disasters occur because an incompetent changes the design or detail, or the specifications are not carried out as intended by the struc-

*Mr. Hemmles is specification writer in the State Department of Architecture, Sacramento.

tural engineer and specification writer. This, of course, could be avoided by rigid inspection.

A large number of inspectors on jobs, are ordinary "experienced building mechanics," with no technical knowledge which would reinforce their practical experience. In a few cities, however, the inspector, appointed by the owner or architect, must meet with the approval of the chief city building inspector.

A state requirement, regulating inspections qualitatively and specifying the kind of construction upon which continuous inspection must be provided, would be an assurance that the safely designed would be safely built.

Certain states have laws which regulate hotel, apartment and tenement house building. These laws provide for fire protection, sanitation and preservation of good morals. Except for local city ordinances, the regulation of auditorium building has been quite ignored in legislation, though such construction is considered by experts to be the most intricate in the building line.

The hotel and tenement house laws have been the cause of great improvement in that class of buildings wherever these laws were enforced and there is no doubt that inspection and auditorium laws would be a protection and of great benefit to the public.

* * * *

Avoid Moisture Where Cement Surfaces Are to Be Painted

THE Research Department of the Bass-Hueter Paint Company contributes the following in regard to increasing the efficiency of painting on concrete or cement surfaces:

"As only partially satisfactory results have been enjoyed in the finishing of concrete and cement surfaces, the use of which is becoming more and more common, we are endeavoring to supply practical information in the hope of making better results possible. The principal drawbacks to successful painting on cement or concrete are moisture and "free lime." The former causes blistering and peeling, the latter destroys the oil in the paint. Free lime is gradually neutralized by exposure to the elements and, therefore, unless it is necessary to paint immediately, cement surfaces present more favorable painting conditions if so exposed for a year or so.

Since concrete floors, etc., cannot be subjected to the same conditions as exterior surfaces, satisfactory painting results can be expected only after every possible effort has been made to neutralize the free lime and to eliminate moisture. The latter is not always possible because many concrete floors in garages, factories, etc., are poured directly on the ground, and consequently the moisture is drawn back for some time through the floor by the warmer atmosphere.

Ordinary varnishes or sizes have no neutralizing effect whatever on cement or concrete surfaces; the action is purely of a physical nature. In view of these facts, it is always advisable to eliminate as far as possible moisture and to neutralize the free lime. Extensive research and experiments have developed that the lime is most satisfactorily neutralized by the proper application of a neutralizing coat consisting of about 8 ozs. Zinc Sulphate Crystals dissolved in 1 gallon of water. The combination thus formed is applied freely to the surface with a large brush and allowed to dry thoroughly before the application of the finishing coats.

Is There Anything to Say for the Cost-Plus Contract?

ACCORDING to the National Federation of Construction Industries five to fifteen per cent of the total construction business in the country can hardly be done on any other basis than some form of cost plus. The next portion relatively greater by a considerable margin, is that which is usually done on a unit price basis, but which might be open for consideration on a cost plus basis. The remaining and greatest portion is now almost invariably done on a lump sum competitive basis. These proportions are not likely to be changed in any large way, but there is a great deal on a lump sum basis which ought to be handled on a cost plus fixed fee or cost plus percentage basis.

In commenting on this the Federation of Construction Industries states that there is no question but that the cost plus basis requires complete confidence on the part of the owner in the integrity as well as the competence of the contractor. Both were lacking in some of the contractors doing cost plus work during the war, and to this fact is attributable the bulk of the unsatisfactory results secured. Aside from this fact speed was a primary consideration and costs were deliberately put into second, third, or fourth place, for perfectly good reasons, but in the "cold morning after" analysis, costs were scrutinized first, and the erroneous conclusion drawn that the cost plus basis was rotten, led to graft and was open to so many criticisms that it was entitled to no place in the consideration of conservative business men.

The truth is that on any construction job on which the estimating is difficult, and on the average industrial plant, power plant, and buildings of any character costing more than $100,000, some form of fee compensation will produce more satisfactory results, 99 cases out of 100, than will the lump sum or any other form of contract, provided it is placed in the right hands. This last point is stressed by the Federation and made the basis of the success of the cost plus scheme.

Ask almost any man who has built a house during the last two or three years on a lump sum competitive basis, how much more it cost him than the contract price. It is hard to find a man who did not pay 25 to 100, and in some cases more than 200 per cent excess to get the house he thought he was buying for the face of the contract. In other words, a lump sum bid is in no sense a guarantee of the final cost.—Exchange.

* * * *

Keep Material Prices Down

A warning against increasing construction costs was voiced by leading general contractors from Los Angeles, the northwest, St. Louis, Chicago, Pittsburgh and New York, in session May 26th at Washington, D. C. They pointed out that if prices of material and labor are increased due to the great volume of construction now being started, stagnation and depression are sure to follow, similar to the depression in the construction industry in 1921, which followed the boom of 1920, when prices and wages went sky-rocketing.

The National Executive Board of the Associated General Contractors strongly urged that a reasonable stand be taken by all elements of the industry to keep costs at the lowest possible level if the great construction program needed by the country is to be carried through successfully.

ACCEPTED DESIGN LOS ANGELES COUNTY AND CITY HALL OF JUSTICE
Allied Architects' Association of Los Angeles

Design for Los Angeles Hall of Justice

AN example of what may be accomplished by the co-ordinated effort of a group of architects is found in the accepted design of the Los Angeles county hall of justice, made by the Allied Architects' Association of Los Angeles. This is the first time such a procedure has been tried. Some feared it would be a dangerous experiment. The result, as far as good feeling and co-operation among the more than a score of architects who participated in the work is concerned, is declared by them to have fully justified the effort.

The accompanying perspective drawing speaks for itself. It is a capital solution of a difficult problem and shows plainly the results of an intensive study. Note the treatment of the upper five stories which

will be devoted to the jail and the roof above the cornice combined with wall enclosing the main roof which will be used for exercising prisoners. As a study in proportion the design is impressive.

The architecture is described as a modified Renaissance reminiscent of a Roman Florentine, and to slight extent, of a Spanish tradition. The exterior will be faced entirely with limestone except for a granite base.

Preliminary plans were worked out by the supervisors in the county drafting room under the personal direction of Mr. J. H. Bean, the supervisor in charge of county building work. Finished floor plans are being completed in the same offices under the joint criticism of Supervisor Bean and executive officers of the Allied Architects' Association. The exterior design, and the interior of the court rooms, staircases, corridors and elevators will be worked out in the drafting room of the Allied Architects' Association, with Supervisor Bean representing the county.

Twenty-three architects submitted 27 sketches. These sketches were not presented to the supervisors, but were considered in an open meeting of the association. Each drawing was criticised by the first group after it had been explained by its author. A committee vote was then taken by the architects themselves. Each design was designated by a letter and each architect made a list ranking the sketches in the order in which he believed the work merited from 1 to 27. These votes added showed the relative composite rank of each sketch. The smallest total was 78 and the largest over 400, the smaller indicating the greater number of individual rankings in first or near first place.

The twenty-three architects were again asked to submit sketches on a larger scale after having been told wherein they had not fulfilled the county's conditions, and having the benefit of the joint criticisms of their co-partners. All submitted sketches and the procedure was the same as in the previous competition. Voting disclosed that the same architect was not first the second time, but the first seven men were the same seven both times. These seven men were then made the committee on design with authority to elect a chairman to work under a committee of the board of directors. No member of the board was a member of the committee on design. At this stage the sketches were submitted to the supervisors for their criticism and suggestions.

Transferring the work from the several architects offices to the drafting office of the association where under a head draftsman and assistant, working through the committee on design, the agreed best elements in the most popular designs, were put together, was the next step in the general procedure. This required about sixty days and the accompanying design, approved by both the city and county in principle, was the product.

* * * *

Important Legal Decision

THE architects sued to recover for services in the preparation of plans for alterations to defendant's house. The defendant had abandoned the alterations and the architects declined to deliver the drawings to him, on the ground that they were following the rule of the American Institute that "drawings and specifications, as instruments of service, are the property of the architect." It was held, that while it might be true that where both parties knew of this rule and contracted in contemplation of it, the drawings would remain the property of the architect, yet, in the case in question, it appearing that the defendant was ignorant of the rule and that no such agreement had been made, the plans belonged to him and the architects could not recover without delivering the drawings.—American Architect.

PLAN FOR GREATER COLLEGE OF AGRICULTURE, DAVIS, CAL.
John William Gregg, Landscape Architect

New Campus Plan for State College of Agriculture at Davis

THE new Campus Plan which is to govern the future growth of the branch of the College of Agriculture at Davis and which has been adopted by the Board of Regents as the official plan for that institution, has just been completed by Professor John William Gregg, Landscape Architect, and is now on display in the Director's office at Davis, where it is attracting a great deal of attention and receiving much favorable comment from all who are interested in the development of a greater institution for Agricultural Instruction and Research.

The plan itself is approximately five by seven feet in size and beautifully rendered in color to bring out the details of the main scheme which shows a practical but aesthetic grouping of buildings around a large central quadrangle which is balanced on Second Street of the town of Davis as a secondary axis and with a broad main roadway from the State Highway on the north determing the main axis.

The detailed arrangement of buildings is such as to eventually form group units with secondary quadrangles which are called for by the style of architecture which is to prevail and which is being worked out by William C. Hays, Architect of San Francisco.

Such utilitarian factors as convenience, accessibility, centralization of special and general types of instruction and research, comfort, and health have all been considered of prime importance in the study and preparation of the plan, which as it develops will gain great architectural and landscape beauty.

Already two new buildings, the Dairy Industries Building and the

Horticultural Building, are being erected according to this plan, and new sidewalks, curbs and roads are now under construction along the new lines with the result that the plan is already beginning to show definite results and furnish a visible suggestion of the future institution.

* * * *

A Notable City Planning Project

THE largest single piece of City Planning by private enterprise ever undertaken in this country for permanent development will be the new Palos Verdes Project in Los Angeles now being financed through nation-wide underwriting. We have the great examples of Washington, D. C., and possibly one or two other cities well planned in advance and built by public enterprise, and our great expositions have furnished stirring object lessons in what can be done by working to a carefully pre-arranged plan, for temporary dream cities. Now, what city planners have long been urging for permanent city building, seems likely of early accomplishment.

The Palos Verdes Project contemplates a new suburb which, though much larger, will be similar to Roland Park, Baltimore; Forest Hills, L. I., and St. Francis Wood, San Francisco, except that there will be a greater proportion of low priced homes and home-sites. A marvelous piece of ground has been secured, containing 16,000 acres (25 square miles) and including almost 14 miles of ocean shore, at the southwest corner of the Los Angeles Metropolitan area, with Catalina Island opposite.

The underwriting calls for a total expenditure of $35,000,000, work to proceed as soon as $15,000,000 of this amount is available. Several million dollars has already been subscribed and it is expected that the fifteen million mark will be passed before summer. Preliminary estimates of improvements include the following items:

Home Building fund	$5,000,000
Streets and roads (125 miles concrete-paved)	6 000,000
Sewers	1,800,000
Water System	1,650,000
Cost of land	5,000,000
Ornamental plantings, art Jury endowment	1,300,000
Hotels and clubs	2,000 000
Parks, schools and playgrounds	2,000,000
Three civic centers with business blocks	3,000,000
University	1,000,000
Transportation	4,000,000
Unapplied, taxes, etc.	2,250,000
Total	$35,000,000

The $5,000,000 Home Building fund is expected to finance the building of several thousand houses, arrangement for second mortgage loans being provided in the Trust Agreement and title already being held to the land. It is proposed to use part of this for the organization of co-partnership housing, similar to that in England, in order to furnish working men's homes in quantity on easy terms, and with maintenance and upkeep provided. No buildings can be built anywhere on the properly unless the plans are approved by the Art Jury, which will be a permanent body, endowed with sufficient funds to do real work. Restrictions will be similar to those of Roland Park, Baltimore.

The staff appointed to develop the project includes Messrs. Olmsted Brothers of Brookline, Mass., Chas. H. Cheney, City Planner; H. T. Cory, Chief of Engineering; Hunter Liggett, Supply Service; Myron

Hunt, Chairman Art Jury, and others of national reputation. All funds are held and administered by the Title Insurance and Trust Co. of Los Angeles, as trustee.

* * * *

New Material to Replace Lumber?

IN the manufacture of Celotex from bagasse (the fibrous refuse of the sugar cane after the sugar juice has been extracted), the manufacturers have not only solved the problem of the disposal of bagasse, which hitherto has been burned, but they have given to the building trade a new building material that can advantageously replace lumber where used as an insulating material.

In the process of manufacture the bagasse goes through breakers, soaking-tanks, steam cookers, washers and beaters, and is automatically passed through the dryers and into the cutting-up saws. Though each board is of the gigantic dimensions 900 feet long and 12 feet wide when first manufactured, the saws divide it into lengths desired while the board is on the last lap of the journey, so that the lengths ordered emerge ready for storage or for shipment without loss of energy or time.

During the process, the long fibers of the sugar cane are firmly matted and interlaced, making a rigid board of ½-inch thickness. Thus Celotex is homogeneous, inasmuch as it is not built up of layers but is of a uniform structure throughout. In this respect it is unique, since most building boards are built up of layers of paper cemented or glued together.

The board is filled with minute air cells formed by the interlacing of the fibers, in addition to the presence of the cells in the fiber and pith of the cane. It is this cellular construction that makes it as light as cork, weighing only sixty-tenths of a pound per square foot.

Primarily, Celotex is an insulation board, in which capacity it functions in any part of the building. On the exterior it can be used as paneling, lapsiding, and sheathing, for it is the only board form of insulation with sufficient strength to supplant lumber in building construction. Its big, smooth surface, free of all cracks and knotholes, gives it an advantage that ordinary lumber can never hope to attain. Inside the building it makes an ideal plaster base, because plaster adheres tenaciously to its surface. It also makes a beautiful finish as a wallboard, whether painted, tinted or left plain.

In addition to being a building material and an insulator of high order, Celotex in all uses deadens sound and controls acoustics. Particularly is this true when it is used as a sub-flooring in walls or ceilings, or under linoleum or carpets, where it keeps the floors warm. Unlike lumber, it will not warp, split or crack. When it is in the process of manufacture it is treated with chemicals that make it waterproof.

Its cellular construction gives it insulation properties that are to be found in no other building material and will save one-third on fuel. It is impervious to decay. This is demonstrated by the raw material bagasse, which lies in open fields exposed to all weather for years without showing signs of disintegration. The only means of destroying the bagasse is to dry and burn it. These qualities make Celotex applicable for hundreds of other uses, such as insulating warehouses, refrigerator cars, fireless cookers, and, in fact, any construction that requires a light insulating material. In all its uses it is as cheap as lumber and yet carries with it many uses that lumber cannot claim.

Paris Plans Moving Sidewalks

In order to relieve the congestion of traffic in Paris streets, pertaining mainly to the central boulevards, it has been proposed to install a system of moving sidewalks which would facilitate the movements of pedestrians. The plan, project or theory at first was regarded with amusement or skepticism, but it appears that the municipal council is treating the matter seriously, as it has decided to open a prize contest for the best solution of the problem. Contestants must present projects comprising detailed description of the proposed system, estimate of construction and installation, designs and profiles drawn to convenient scale, expose of the practical working of the system, plan of stations and proposed manner of reducing noise. Prizes of 100,000, 50,000 and 30,000 francs are offered for the best propositions. If the city of Paris should adopt any one of the prize-winning projects it could (failing a mutual agreement with the author of the project) acquire full ownership for the fixed sum of 500,000 francs.

The contest is open to foreigners, subject to the approval of the administration, and the contestants must make special demand to the Prefet de la Seine at least three months before the close of the contest.

* * * *

Germans Plan First Skyscraper in Europe

A thirty story skyscraper—the first in Europe— will be erected in Leipzig, where for over 400 years merchants from all over the world have assembled twice a year, in spring and fall, to get ideas on new merchandise assembled there by thousands of exhibitors. The architect of the proposed building is Prof. Peter Behrens, who visited this country in 1913, having been commissioned by the German government to prepare plans for a new embassy building in Washington. The skyscraper will cost 250,000,000 marks..

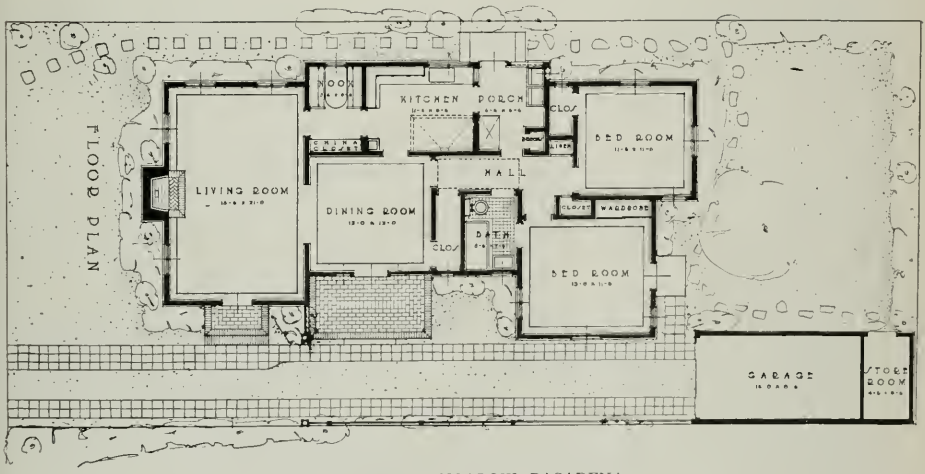
* * * *

An Attractive Small Home

AN unusually good example of what can be accomplished on a very narrow lot, is the residence of Mrs. Lynn Helm in Pasadena, by Witmer and Watson, architects, of Los Angeles. All the rooms are light and airy and have privacy, and there is a small terrace at the side of the house which really forms another room. A decorative fence screens this outdoor living room from the neighboring house and from the passers-by, and a bright awning enables one to have either sunshine or shade, according to weather conditions; opening from the dining-room, it forms an ideal place for afternoon tea or for al fresco meals.

This house, here illustrated by courtesy of California Southland Supplement No 1, "California Homes by California Architects," compiled by Ellen Leech, is built of wide siding, but the majority of the residences erected by this firm are of brick or hollow tile, and at the present time they are working out, on several homes, the newest method of construction, hollow concrete. Most people think of concrete houses as being of necessity ugly, square and heavy, and of the type built by the hundreds for factory hands. One two-story residence, which is nearing completion, is in the Spanish style, with tile roof, patio, and attractive entrance, and has a most interesting wall surface, produced by the molds into which the concrete was poured. The house will be white-washed, with just a touch of color in the wash, instead of plastered, in order that this unusual texture may be retained.

RUSTIC BUNGALOW, PASADENA
Witmer & Watson, Architects



PLANS, RUSTIC BUNGALOW, PASADENA
Witmer & Watson, Architects

Insulating of Sound in Building

THE demand for quiet rooms in hospitals, hotels and office buildings, the desirability of insulating music studios and other rooms where disturbing sounds are produced, and the necessity for solving other problems for the control of noise have led to repeated requests from architects and builders for reliable information on effective methods for insulating sound. A valuable bulletin on this subject has been published recently by the Engineering Experiment Station of the University of Illinois. In this publication, "Sound-Proof Partitions," the author, Prof. F. R. Watson of the university, presents the available information in a systematic way, giving the methods and results of various investigations relating to the action of materials on sound, describing practical installations of soundproofing, and setting forth in accordance with existing knowledge recommendations that may be applied where sound insulation is wanted.

The information in the bulletin was drawn from three sources: the theory of the behavior of sound waves, experimental investigations of the effect of materials on sound, and examples of sound-proof installations. The details of this information, while drawn from different sources and apparently unrelated, co-ordinate in a satisfactory way in setting forth similar conclusions.

Some of the more general principles and recommendations in the bulletin are stated in the following paragraphs:

Sound may be transmitted from one side of a partition to the other in three ways; it may progress through continuous air passages, it may pass as an elastic wave through the solid structure of the partition, or, by setting the partition in vibration, it may originate sound waves on the further side.

These actions are quite readily understood by remembering that sound consists of a series of compressions and rarefactions that progress rapidly through a medium without interruption unless they meet a new medium with a different elasticity or density. For instance, sound waves in air proceed without hindrance through air passages, such as ventilation openings in a partition. If, however, the passages are small in cross-section, as in the case of a porous material, the progress is hindered and a certain amount of absorption of the energy takes place, due to the friction set up between the vibrating air column and the sides of the pores.

In cases the partition is impervious to air, the direct progress of the wave is interrupted. A thin partition is set in vibration and thus originates new waves on the side opposite the incident sound. For a thicker, more rigid partition, the vibrations are smaller and a very considerable part of the energy is reflected. The transmission in this case takes place by compressional waves communicated to the solid material of the partition. The amount of energy thus transmitted is usually quite small.

In view of these considerations a sound-proof partition should be as rigid and free from air passages as possible. For effective soundproofing of a group of rooms, the partitions, floors and ceilings between adjacent rooms should be made continuous and rigid. Any necessary openings for pipes, ventilators, doors and windows should be placed in outside or corridor walls where a leakage of sound will be less objectionable.

In case the sound is generated in the building structure, as the vibrations set up by a motor fastened to the floor, the compressional waves

proceed through the continuity of solid materials. In order to stop them, it is necessary to make a break in the structure so as to interpose a new medium differing in elasticity and density. For instance, the vibrations of a motor may be minimized by placing a layer of hairfelt, or smilar air-filled material, between the supporting base and floor. Where the machine is quite heavy, footings may be made of alternate layers of asbestos, lead and leather. Bolting through this material will reduce the insulation, because the vibrations in this case will pass easily through the bolts to the floor. The insulation should thus be left without any bridging over of the discontinuities. Air gaps in masonry will be effective if the air space is not bridged over at any point. A floor floated on sand, sawdust, or hairfelt would approximate this condition. The edges of the floor should be insulated from the walls by felt or similar material.

Especial attention should be paid to the ventilation system. All effective sound-proof construction either omit entirely a ventilation system or else construct it in some special manner to avoid transmission of sound. In some buildings air is supplied and withdrawn from rooms by individual pipes that are small in diameter and extend without break from the air supply chamber to the rooms. This results in considerable friction between the walls of the pipes and the air, with a resultant weakening of the sound waves. Without some efficient control of the transference of sound through the ventilation system it is a waste of effort to construct soundproof walls, double doors, and other contrivances for insulation.

When soundproofing a building all details should be considered with respect to the likelihood of transmission of sound. Each room, as far as possible, should be made an insulated unit by means of air spaces or air-filled materials that separate it from surrounding walls. Pipes and ventilators should be so installed as to minimize the chance of transfer of sound. Patent doors are now available that will close the door space at top, sides and bottom. In case a troublesome sound is generated in the room, it may be minimized by installing absorbing material on the walls.

The absorption of sound is an essential feature for soundproofing. Reflecting sound and scattering it still leaves it with energy. It must be absorbed; that is, converted into heat energy by friction, before it is eliminated as sound. This means that carpets, furniture, draperies, etc., should be present, or if greater absorption is desired, hairfelt or similar materials must be installed.

The insulation of sound is a complex problem and a successful solution is obtained only when all the possibilities of transfer of sound are anticipated and guarded against. While many things may be learned from further experience and much may be gained from additional theory, enough has been revealed to give encouragement to the belief that soundproofing may be prescribed in the future with some of the certaintly that now attends the acoustic design of auditoriums.

* * * *

Centennial Exposition at Philadelphia in 1926

Architects, engineers and builders are manifesting considerable interest in the probable type of construction that is going to be followed in the layout of grounds and buildings for the Sesqui-Centennial Exposition, to be held in Philadelphia in 1926, in celebration of the 150th anniversary of the signing of the Declaration of Independence. A report has recently been published by a committee of engineers going into the various points

of construction, landscaping, transportation, communication, lighting, etc. It is a comprehensive and constructive document and may be obtained by those interested by addressing the Sesqui-Centennial Exposition, Bellevue Stratford, Philadelphia.

Mr. Cass Gilbert, well-known New York architect, recently addressed a meeting of Philadelphia business men on the subject of the Centennial, and the following extracts from his talk will be found of interest; emphasizing as they do the desire of this distinguished architect to have an exposition of inherent beauty:

"You are about to launch a great exposition here in Philadelphia. You set great standards in 1876, but those are no standards for today. It is up to Philadelphia to reach so far beyond the standard of any exposition that has followed the Centennial that whatever you do will stand for years as something that will inspire you.

"If you can make your exposition one of beauty, you will accomplish more even for those purely commercial phases of the exposition than they could possibly accomplish otherwise. Love of beauty is inherent in the race. The very impulse of the Sesqui-Centennial should be one of creating new and higher standards of beauty.

"The cost makes no difference. Build within the limits of your purse, but make beauty the keynote of all you do. Whatever you do let the subject be well worth the price. Philadelphia has the greatest opportunity to do a great thing than any city in the world has ever had, and I think she is going to realize it."

* * * *

Color in Interior Decoration

By JOHN CHAPMAN

FOR those lovers of beauty in color whose means do not permit the purchasing of Gainsboroughs for mural decoration, there is always the opportunity of transposing a color scheme from such masterpieces and recreating the same harmonies in interior decoration; which, in many ways is very similar to the painting of a picture. In both cases the "tout ensemble" has to be studied as well as the detail; lighting has to be considered just as much by the decorator as by the painter, and from these masterpieces of art one can acquire a sound knowledge of harmony and proportion of colors and lighting effects.

In decorating an Italian Renaissance home, for example, one gains a wealth of ideas by studying the color schemes of such masters of the art as Titian; his "Flora" or the "Duchess of Urbino" could be taken, and the color harmonies of these two beautiful works introduced into the decoration of the home; or for those lovers of more lavish coloring the Venetian school could be chosen and schemes arranged from the works of these princes of color, Tintoretto or Paulo Veronese.

One of the most successful means of acquiring the richness in color harmony of these masterpieces is by employing hangings or old brocades, damasks, velvets and embroideries. Many fine examples are coming to us from South America, whose grandees bought extensively from Europe in the past. On exhibition at the Lopez Studios, Pasadena, last month was part of a collection of antiquities belonging to Madame Julia Rodezno, whose knowledge of textiles extends deeply into the period and weave of the exquisite fabrics she has gathered from all over the world.

Pier Failure Endangers Concrete Bridge

A Lesson for Designers in the Settlement of the Foundation of an Arch Bridge in Arizona

THE interdependence of superstructure and foundation was forcibly brought home to all designers by the failure of one pier of a concrete arch bridge across the Salt River at Tempe, Arizona recently. The bridge was built in 1911-1913 and is a link in the main highway route from Phoenix and the Salt River Valley to the eastern and southern portions of the state. It is crossed by about two thousand five hundred vehicles per day. There are eleven two rib, three-hinged arches with open spandrels and the spans are one hundred and twenty-five feet. Nearly all the piers were carried to rock in open excavation but some rested on concrete cylinders sunk to rock. It was one of these steel cylinders that settled.

The first settlement that was noticed was four and one-half inches at pier number nine, the second from the north end of the bridge. There was no interruption of traffic for several weeks when a further settlement of one-half inch occurred. A two-ton limit was placed on the bridge but three weeks later the settlement reached six inches and the bridge was closed to traffic. The following day there was a sudden drop of nearly five inches bringing the total settlement to nearly one foot. The pier also shifted down stream about 0.1 ft. Although the roadway had settled almost a foot, there were no cracks visible in the concrete in the region of settlement with the exception of handrails which were badly cracked. The longitudinal steel no doubt prevented the fine hair cracks from showing. Falsework was erected to provide a temporary support for pier number nine by means of heavy timbers and the bridge was thrown open to traffic in little over a month from the time the last settlement was noticed.

By sinking the foundation for pier nine to rock by using steel cylinders, the sand and gravel around the pier was left in its undisturbed condition and doubtless some of the load was carried by this gravel by way of the pier block which rested on the two cylinders. It was found on examination of the conditions at the base of the pier that all the sand had been scoured out with the exception of some thin layers over the bed rock, leaving the pier supported on the two cylinders, which proved inadequate to carry the load. In the light of difficulties subsequently experienced in sinking new cylinders it is very probable that the concrete in the base of the piers was of very poor quality or that a foot or so of gravel had filtered into the cylinder after the rock had been cleaned off. This would cause the crumpling of the steel at the bottom which is what actually happened, it is believed.

A number of other defects were found and it was thought advisable to do all the repair work at the same time. Several of the spandrel columns were broken in horizontal shear near the extrados and several spandrel walls near the crown had pulled loose from the arch rings. The roadway slabs and the spandrel arches were cracked completely through in a number of places and there was considerable trouble at the floor expansion joint.

As already mentioned emergency measures were taken, immediately after the last settlement had taken place, to stop any further movement of the pier. Sand bags were thrown around pier nine to prevent further scouring and towers were built at the crown of spans 7-8 and

10-11 with the object of saving the remainder of the bridge in the event of the spans on either side of pier nine going out. On account of the depth of the water it was found to be impossible to build supports any closer to the damaged pier. No settlement of the pier occurred after these supports were erected and later in the month piles were driven in the bed of the stream on which to place timber bents in spans 8-9 and 9-10. In this manner all the load was taken off pier nine and the work of underpinning was proceeded with.

The general scheme of repair was to sink six new cylinders, three on either side of the two existing ones, cut out parts of the pier block and insert reinforced concrete beams to transfer the load to the new cylinders. A great deal of difficulty was experienced in keeping the sand silt off the rock while the anchor holes were cut and it was found that grouting had to be resorted to in order that the cylinders could be pumped clean. The anchor bolts were then placed, the cylinders concreted up to the bottom of the pier block, and the reinforced beams placed from one cylinder to the other.

No effort was made to raise the pier or floor but the handrail was rebuilt to remove the appearence of sag and it is proposed to fill up the depression in the roadway with some kind of paving block.

While the failure is not considered serious, in that no lives were lost, yet the amount of time and money spent on the repair of this bridge certainly justifies the conviction that more care should be taken with the design and construction of projects of this kind. Although the bridge stood up for a number of years without any sign of weakness, it was only necessary to have scour take place around the piers to have one of them fail and the fact that a great deal of damage was not done can be attributed largely to the continuity of the minor structural elements and the possible lateral resistence of the soil around the piers.

* * * *

Exhibit of American Architecture

THE exhibit of American architecture organized by the American Institute of Architects and displayed in Paris and London last year, has aroused so much interest abroad that plans are now being made for showing it in other European cities.

The Royal Institute of British architects has cabled Julian Clarence Levi, secretary of the committee of the American Institute of Architects, proposing a series of exhibitions in the larger English cities. Should this prove feasible there is a strong probability that the exhibits will then be sent to Italy and shown in Rome.

The exhibit comprises a large number of photographs of the most notable buildings in the United States and represents many American cities, New York, Philadelphia, Washington, San Francisco, Detroit, Indianapolis, Denver, state capitols in Connecticut, Wisconsin, Missouri and examples of the architecture of American ecclesiastical and educational institutions.

It was shown at the annual exhibition of the Societe des Artistes Francais in Paris last spring and afterward under the auspices of the Royal Institute of British Architects in London.

What Does "Rent" Mean?

By EDWARD M. APPLEGARTH
Secretary, Building Owners' and Managers' Association of San Francisco,
in Building Management

THE word "Rent" as used today is too general a term to convey to the public mind what such a payment represents in connection with the Class A office building. Webster's New International Dictionary gives the following definition:

"RENT—The return made by the tenant or occupant of land or corporeal hereditaments to the owner for the use thereof. A certain periodical profit, whether in money, provisions, chattels or sources issuing out of lands and tenements in payment for the use, commonly a certain pecuniary sum agreed upon between the tenant and his landlord and paid at fixed intervals by the tenant to the landlord for the use of land or its appendages."

In Nelson's Perpetual Loose Leaf Encyclopedia we find:

"RENT—The consideration paid by a tenant to his landlord for the use and occupation of real property."

In the Encyclopedia Britannica we find:

"RENT—Is a certain and periodical payment for service made or rendered by the tenant of a corporeal hereditament and issuing out of (the property of) such hereditament."

Rents as they now exist in England are divided into two great claims, rent service and rent charge.

A rent service is so called because by it a tenure, by means of service is created between the landlord and the tenant. A rent charge is the grant of an annual sum payable out of lands in which the grantor has an estate. Rents in kind still exist, thus the corporation of London is tenant of some lands in Shropshire by payment to the Crown of an annual rent of a Fagot.

Peppercorn Rents—supposedly nominal, an obligation to pay 1 bbl. of pepper consisted of a substantial impost even as late as the 18th century.

In connection with the word "Lodger" in the Encyclopedia Britannica we find it applies most frequently and properly "to a person who takes furnished rooms in a house, the landlord also residing in the premises and supplying him with attendance," but we have no word which represents the idea of a payment covering both the bare use of real property and in addition the receipt of certain service or services furnished by the landlord. The only service mentioned in the definition above in the Encyclopedia Britannica is the service of the tenant to the landlord.

On leaving a hotel the guest asks for his bill or statement of account and he would not think of saying he wanted to "pay his rent" in fact rent, as applied to a hotel, would be the payment by the lessee to the lessor and you would not think of using it in connection with the payment by the guest to the management, but the general run of tenants of office buildings use the word "rent" having in mind "the use and occupancy of real property and its corporeal hereditaments" and have no conception that the payment they make each month covers more than Webster's definition conveys.

Webster says above "a certain periodic profit" which would be true where the landlord gives the use of real property and its corporeal hereditaments, but does not necessarily follow where he pays out most of the money received, and sometimes all of it for expenses.

The hotel guest knows his bill is for lodging and for services afforded by the hotel. It includes payment for light, heat, clean linen, the room furnishings, hot water, the use of the lobby, the services afforded at the desk to visitors enquiring for guests, the convenience of elevators with attendants subject to call, with telephone connections in room, with a dining room on the premises, with a readiness to serve meals or refreshments in the rooms, it includes safety afforded by the house detectives, the watchman and fire protection.

The word "Rent" is not used in connection with hotels and it should not be used in connection with office buildings. The reason a man will pay $15 a day for hotel accommodations and will say he is being robbed if asked to pay $3 a day for office building accommodations is that in the case of hotels he realizes he is paying for service for the care of the building and the character of the establishment. In the case of the office building he still thinks he is paying only for the use of the real property.

* * * *

Of Quantity Surveys*

SOME PROS AND CONS

By JOHN R. WIGGINS

ON REPEATED occasions I have presented to gatherings of builders, and particularly to representative members and to the executive board of the Associated General Contractors of America, the views I hold with regard to the practical application of the quantity survey and its effect upon the general contractors throughout the country.

In these friendly discussions, I have made a distinct effort not to consider the theoretical aspects of the question, but to confine my remarks to the practical side only. It may be of some service for the practical side of quantity survey to be summarized here, as I shall try to do in the briefest possible manner.

WHO IS RESPONSIBLE FOR ERRORS?

A number of questions immediately present themselves. The first concerns the question of responsibility by which we, as members of the Associated General Contractors of America, set so much store: Who is responsible for errors in the quantity survey?

We know that the owner, when he enters into a contract for construction work, will expect the contractor to be responsible. Most certainly he will not anticipate paying additional sums on the contractor's claim that the quantity surveyors made errors in their estimates. Naturally the contractor will not be willing to assume responsibility for errors by quantity surveyors, which raises the most practical question in the mind of the contractor, as to whether the quantity surveyors will be men who can take financial responsibility for their errors.

Those who favor the quantity survey state that firms will be organized with sufficient financial strength to be responsible for their mistakes, yet how can the surveyors be responsible for the ability of the contractor to complete his work with the estimated amounts of material? Will there not be a dispute between the contractor and the surveyor, if too great or too small a volume of materials should be called for by the survey? In the case of too small quantities of materials the

*Address presented before the General Session, Annual Meeting, A. G. C., Cleveland, Ohio.

contractor will claim that the surveyor did not provide for sufficient material, while the surveyor will claim that the contractor used it wastefully. Disputes of this kind will complicate still further the already complex methods of carrying on a general contracting business.

BURDEN ON THE CONTRACTOR

As a matter of fact, are not the General Contractors of America the only really financially responsible parties in general contract work under the owner? In view of this fact, would not a contractor be arranging to play the part of the "goat" by the assumption of responsibility for work done outside of his office, outside of his supervision, and by people not of his own choosing?

After the quantity survey has been made, is it possible for any one in a builder's office to put a proper price on quantities, unless he personally goes over the plans to ascertain the character of the work covered in those quantities? And does he not thereby, through duplication of effort, increase rather than lessen the cost of estimating?

Further, can a builder who endeavors to live up to the magnificent slogan of the Associated General Contractors of America: "Skill, Integrity and Responsibility," be satisfied with so loose a method as having the men in his office price another man's quantities without thoroughly going over the same work as the quantity surveyor? Without this duplication of the quantity surveyor's work, the men in the builder's office, pricing the job, could not have a complete and intelligent conception of the work to be priced; and without this thorough understanding, they are not fitted to price the work at the low units necessary to secure a contract under close competition. Therefore, should pricing be done without the intimate knowledge to be gained only by going over the work of the quantity surveyor, higher estimates and increased cost to the owner will be sure to result.

The builder, who has accepted the ideals of the Associated General Contractors of America as his guide in business, looks with contempt on a competitor who is willing to reduce his estimates on a building because the owner or architect has informed him that John Doe will do the work so much more cheaply. Why then, should we not come under the same condemnation, if we accept figures of others, instead of ascertaining and making sure by our own personal knowledge what sum we are willing to place upon a certain piece of work?

ARCHITECT'S TERRITORY

I have been informed by a certain prominent architect in Philadelphia that when an owner asks him what general contractors do for the item in his cost make-up designated "Contractor's Profit," he, the architect, regrets that he is compelled to reply, "Nothing." It has been my practice, when I have been complimented on the beauty or layout of a building our company has erected, to reply that the credit belonged to the architect, for he had conceived the beauty of its appearance and designed its layout.

But it is my belief that a great majority of the architects of America have neither the organization nor the know-how to carry out the construction of the magnificent creations they have conceived. Now if it is the desire of contractors to help them to get together an organization and acquire the know-how, they can do so best by permitting the gradual elimination of the various departments that go to make up their organizations as a whole, and the final outcome will be that general contractors will be eliminated themselves.

PRICING CONTRACTS

Even the proponents of the quantity survey do not claim that under it the surveyors could price the jobs, in addition to taking off the quantities. As a general proposition, the quantity surveyor would not be in a position to price the work; not because of lack of native ability, but because of lack of experience, and particularly because the quantity surveyor cannot know how closely a builder can price the work.

Experience has proven the necessity of taking off the quantities and pricing them in the same office. In no other way, I firmly believe, can a builder successfully meet the hardpan competition of the present day, and in no other way can he uphold and augment the standing and efficiency of the general contractor.

* * * *

Rare Stained Glass Window

Pacific Coast visitors to New York will undoubtedly wish to view the famous Jesse window that has recently been installed in the Metropolitan museum of Art. The museum collection of stained glass has gained much distinction through the acquisition of this window representing the Tree of Jesse. The glass is composed of six large medallions with pairs of smaller medallions between, and measures 12 feet, 10 inches in height, 13⅜ inches in width. This panel probably formed one light of a double or triple lancet-window. The glass has very little restoration and is in unusually good condition for work of such an early period. It was the rarest item in the Costessey Collection, formerly at Costessey Hall at Norfolk, England, a collection made in the late eighteenth or early nineteenth century. The provenance of the Costessey glass is unknown, but the Jesse window may be ascribed with certainty to the early Gothic period of the Lower Rhenish school (about 1300). It is exhibited in a small chapel-like structure in the mediaeval room, second floor, Wing J, where it is shown by artificial light owing to the present lack of space for exhibiting glass by daylight.

* * * *

Heatless Light

Heatless light, the goal toward which illuminating engineers have been working these many years, appears almost to have been attained in a new sort of light which has been developed by Professor Dussaud in Germany. The construction of the lamp is very ingenious. It consists of a number of mirrors and ordinary Tungsten filament lights. These lights are connected with the electric circuit through a rotating disc, fashioned from insulating material. The current is taken by copper brushes from copper plates imbedded in this disc, with the result that one light after another is turned on and off every second. Ordinarily this would result in a flickering light which would be altogether useless, but by a special arrangement of the mirrors the light is so concentrated that it appears absolutely constant to the eye. Not only is the amount of heat that is generated during the production of this light kept down to a minimum, but a great saving is also effected in the current consumption. Similarly, the burning out of the lamps is avoided and their life is increased very considerably. There is a wide range of possibilities for such a lamp in modern life.

Some Thoughts on Co-operation

By ERNEST T. TRIGG
President National Federation of Construction Industries.

IT is likely that there was never a period in the United States, during times of peace, when co-operation of all the people was more needed than now. Contractors, artisans, bankers, railroad men, miners, farmers, women—indeed everybody—must join in unselfish, helpful, friendly, and intelligent co-operative effort, and maintain a magnanimous spirit one toward another, if we are to obtain for our country the prosperity and internal peace which should be the goal of all.

This is particularly true of those connected with the construction industry. The condition of this industry, and particularly the building branch, has probably larger and more potent possibilities of influence upon the business and industry of the country as a whole, than any other division of productive activity. It represents, next to agriculture, the greatest classification of industrial activity in the country, and is the industry through which the permanent wealth of the country is largely created.

We are now in process of endeavoring to re-establish a proper balance in construction, and to readjust prices and production to points where construction may be renewed economically in sufficiently great volume not only to supply the normal needs of the people, but to make up the shortages caused by the unbalanced activities of the past few years. This is a large project, and only through co-operation and by all working harmoniously together can it be carried out properly.

But in the great work of reconstruction it would be unwise for us to aim merely at a return to pre-war activities. There have been various undesirable influences at work for a score or more years which, in many cases, have been intensified by the war, and certain unsatisfactory conditions and practices have been permitted to continue with little or no change to the present time. It is a few of the problems caused by these influences and conditions, and of the kind of co-operation that seems essential for their solution, that I speak today.

One thing seems very evident,—that before we can look for a permanent revival of CONSTRUCTION ACTIVITIES, we must as an INDUSTRY, justify to the Public a full confidence in values, and that means to a large degree,—that we must earn and be entitled to their confidence in our practices and in our performance. Unfortunately, perhaps due in a measure to the nature of the Construction Industry, there have been in the past in some instances, aggravated examples of collusion resulting in unnecessary delays and expenses, which the Public has had to pay for. We can never hope to enjoy that full warranted confidence of the Public until all wrong, unfair and unnecessary acts on the part of any branch of the Industry are eliminated and we deal with the Public in an earnest, honorable, open way and give them full value for their money invested.

I do not believe that the practices which fair-minded men in the Industry condemn, have been general because I do believe that the great majority of persons, including labor,—actively and directly engaged in the Construction Industry, are just as honorable and fair as are the men in any other line of activity. It is, once more, a case of the actions of a few selfish and narrow-visioned men who have for their own immediate and temporary gain, brought more or less general disrepute on an entire industry.

In the matter of home-building—of which there is such a great shortage, we know that since the signing of the Armistice there has not been a general return of activity because prospective buyers have not had sufficient confidence in the stability values. There are three outstanding elements entering into the cost of constructing a home. I refer to the cost of such financing as is required; to the cost of materials, and to the cost of labor. Fortunately, the cost of getting the money necessary is, today, on a reasonable basis and speaking generally, home-building can be financed without exorbitant charges. Many material costs have been reduced to a reasonable level, in some instances below the cost of replacement. Other building materials are still high and the manufacturers of such materials will sooner or later, be obliged to realize that they are not only retarding their own activities but that they are holding back business possibilities on the part of other building material manufacturers who have reduced their prices, and that they are keeping engineers, architects, contractors and labor from useful occupation, and adding materially to our NATIONAL UNEMPLOYMENT PROBLEM.

Labor in some centres has been wise enough to accept reasonable reductions but so far as the building trades are concerned I do not think this is generally true. I am not an advocate of hiring labor at the lowest figure to which it can be driven. I believe that labor should receive a compensation sufficient not only to take care of the necessities of life, but to enable the family to provide proper education for the children, to enjoy some of the comforts of the modern day and to have a little left for systematic saving. I have advocated this for over a year and have yet to find a contradiction of the righteousness of this basis, from any reliable source. In considering the Building Trades specifically, it must be remembered that employment is not of the continuous, all-year-round, every-day-in-the-week nature that exists in the over-statement. In the readjustment of wages in the Building Trades, I feel that the rates paid to so-called Common Labor should more closely approach the rates paid to skilled labor than in the past. We all remember how prior to the World War common labor often times was paid as low as 17½c an hour and in some communities even less. On the basis of a ten-hour day and four day a week, this meant that many a husband and father went home to his wife and growing family with only $7.00 in his pocket to cover 7 days' expenses. We can all realize what this means and it is very much to be desired in my opinion, that we do not permit the wage of common labor in the Building Trades to again come down to the low point of the past.

On the other side of this question we are now confronted with organized groups of working men in some localities, who it is stated by their leaders, refuse to accept a reduction in their wages from the peak rates of 1920. This sort of a policy cannot prevail eventually and adherence to it simply means a delay in the inevitable readjustment and means not only unnecessary continued stagnation in building activities where it exists; but means great suffering and a great economic loss to everyone involved. I have faith in the fairness and in the good, common-sense of the great majority of our working men and I hope that the time is not far distant when this good, common-sense is going to assert itself in the communities not yet readjusted, to the end that labor may do its part to encourage the return of confidence in the Building Trades as a whole and a return of genuine and permanent activity.

The construction industry presents an unusually complex problem, because the contractor, as a rule, maintains only a skeleton permanent force, while the great bulk of the employees under his direction rapidly change in personnel. Under these conditions it is a matter of extreme difficulty for a single employer to build up the substantial and reliable forms of contact between himself and his workers which are to be found in many of our best-managed and controlled industrial establishments having plants in fixed locations and carrying on a more or less continuous operation.

The problem is, however, in many respects, one for community cooperation. I feel strongly that each community should have a committee of employers, engineers, architects, and others, to which is delegated the specific problem of endeavoring to develop plans under which the investor, the architect and engineer, the employer, and the workman, may safely join in agreements that there shall be no stoppage of work in the nature of strikes or lockouts as methods of settling differences, and that there shall be no discrimination in employment as between union and non-union men. An integral and co-ordinate part of the Committee's work would be to endeavor to set forth means whereby justice and fair dealing will prevail in a way to protect those who have entered into such agreements.

There is reason for the expectation that methods may be developed through these means which will, at least in a measure, eliminate the enormous costs, to all affected, of artificial stoppage of work through labor troubles; reduce the antagonisms and lack of loyalty which so often exist in the construction industries; and replace the latter by goodwill and frank understanding between employers and employees. Is there not reason to believe that if this subject is entered into with a distinctly co-operative spirit, and with intelligence, by a community, the results will be worth while? Certainly the best interests of employers and employees as well as the public will be conserved if success is attained in this direction.

* * * *

Elihu Root Receives Medal

IN recognition of Elihu Root's services to the commission which undertook the rehabilitation of Washington, D. C., on the original design of L'Enfant, a group of artists and architects on May 3 presented a gold medal to him at a dinner in the University Club.

"Mr. Root has a long and extremely important record in his efforts in behalf of American architecture," said John Mead Howells, president of the American group, in a statement telling of the honor. "Mr. Root, Mr. Roosevelt and Mr. Taft were responsible for the rehabilitation of the original plan of Washington, D. C., designed by L'Enfant and approved by Thomas Jefferson.

"It was, however, Mr. Root's untiring support which made possible the work of the commission, consisting of McKim, Burnham, Olmstead and Saint-Gaudens. As Secretary of War and Secretary of State he did everything in his power to drive as many stakes as possible in pinning that plan to the District of Columbia, to use his own words.

"Mr. Root also made possible the establishment of the National Commission of Fine Arts in Washington, and he helped to organize the American Federation of Arts."

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W. H. Lowe - - - - Roofs and Roofing
Fred'k N. Woods, Jr. - - Rock and Gravel
Chas. Felix Butte - Electrical Construction
J. W. Fricke - - - - School Equipment
Will J. French - - Department of Safety

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Uniting the Construction Industry

For the first time in the history of American industrial development a great industry has united all its elements — manufacturers, labor, and the professional branches—in a great effort to raise the standards and efficiency of the industry and improve the service which it renders the public. The nearest precedent is that furnished by the selection of Mr. Will H. Hays as arbiter of the motion picture industry, but the American Construction Council, on which the organization details are now being completed, goes much farther. It dips down into the industry and brings together for conference, for betterment of understanding and for common action the architects, the engineers, labor contractors, materials manufacturers and dealers, bankers and insurance men—all elements concerned with building work of any description and with the construction of public works, railroads, bridges, irrigation works, etc.

It is stipulated that all the work of the Council must square with the public welfare and so dominant has this idea been in the preliminary conferences that Secretary of Commerce Hoover, seeing the benefits that will result, has taken the responsibility of presiding at the formal organizing meeting in Washington, D. C., during the current month, and Mr. Franklin D. Roosevelt, of New York, former Assistant Secretary of the Navy, has accepted the presidency of the organization.

The possibilities of the new organization are tremendous. If the reader were asked to tell what construction really is, the reply would probably be, "housing" or "plant construction and commercial building" or "highways and bridges, railroads and canals" or perhaps "terminals for railroads and ship traffic or irrigation and reclamation projects." Yet all of these are merely divisions or classifications of a single industry and should be included in the thought of the whole.

Instead of thinking of the building of houses as the individual expression of the fancy of the individual citizens, of the building of highways and railroads as merely the means of an industry we call transportation, of factory building and hydro-electric construction as isolated enterprises embarked in by isolated groups of individuals for private gain, we must think of construction as we do of agriculture, or of mining, or of manufacturing —as one of the great creators of permanent wealth, as one of the foundation stones in our civilization on which our progress is built.

Already indications of this are

evident. Construction reports have become equal to crop reports as barometric indicators of the material prosperity of the country. On their rise and fall depends the well-being of millions of our people, the success of great enterprises, the future welfare of our citizens.

One great problem stands ready for effective handling. It is the shortage of building mechanics, and the labor organizations need help in establishing necessary apprenticeship system. Mr. Hoover's department is making a national study of building codes, and when its work is completed there must be a nation-wide activity to carry the recommendations into effect—a type of activity which the new organization is designed to promote. In its organization the cardinal feature of the Council lies in giving each group equal voting power. The ten groups agreed upon are: Architects, engineers, construction labor, general contractors, sub-contractors, materials and equipment manufacturers, materials and equipment dealers; bond, insurance and real estate interests; construction departments of public utilities, and the construction departments of federal, state and municipal governments. Some of the associations engaged in the organization work have been the American Institute of Architects, the Federal American Engineering Societies, the Building Trades Department of the American Federation of Labor, the Associated General Contractors, the National Federation of Construction Industries, the National Building Congress, the National Association of Building Exchanges, the Building Trades Employers Association, the National Real Estate Board, besides a large number of associations of manufacturers.

With this strong backing the organizers feel confident that the American Construction Council will quickly be able to play an important part in the industrial life of the nation. Work of great magnitude lies right at hand, crying for attention. The public demands that the industry square itself with the public interest by eliminating the minority that have brought it into ill-repute. The individual elements of the industry are aroused to the responsibility which it owes the public and to the opportunities for elimination both of duplicate association efforts and of wastes in construction operations.

The time is most propitious for action.

Notes and Comments

GUARD AGAINST ACCIDENTS

During these days of building construction on a large scale in both Northern and Southern California, extraordinary precautions should be taken to prevent accidents. These precautions are necessary even when business is dull, but in boom times there is more of a tendency to put applicants to work simply because they apply. Only experienced mechanics should be employed in erecting and installing the equipment to be used on each job. There is need of adequate inspection and testing. There are too many deaths under the construction heading. Men fall from scaffolds, sometimes because there are no safety supports. Provision to prevent falling objects striking men below should be one of the first factors in making places of employment safe. Especial care should be taken by superintendents and foremen to properly supervise each installation designed to carry men and material. The Industrial Accident Commission has neither men nor money to enable its Safety Department to adequately guide the important work. It is positively necessary for the contractors, all

in authority, and the employees themselves, to do those things that will mean the clean record. There are a sufficient number of risks on each construction job without needlessly adding to the number. The employee who disobeys orders or instructions, or fails to do his work in the careful way, is a menace to himself and to all the other men on the job. The General Construction Safety Orders promulgated by the California Industrial Accident Commission, should be made the minimum standards.

* * *

NATIONS AMAZING WASTE IN BUILDING MATERIALS

The aggregate annual repair bill of home-owners in this country will this year amount to $540,041,769 for one item alone—the replacement of rusted sheet metal work, including leaders and gutters, valleys and flashings. This is the outstanding fact brought out by a survey just completed by the Copper & Brass Research Association.

It is estimated that there are in use in this country at the present time 5,175,000,000 feet of leaders and gutters and that about one billion feet is renewed annually.

The cost of replacements of rusted iron and steel pipe in plumbing is placed at $86,500,000 annually, making a total annual rust bill of approximately $626,500,000.

Of every dollar spent in residence construction, 36.1 cents is spent for masonry, 29.1 cents for carpentry, 8.7 cents for heating, 6.5 cents for painting, 6 cents for electrical work, 6 cents for plumbing 3.5 cents for sheet metal work, 2.9 cents for roofing and 1.2 cents for hardware.

The survey shows that the four last named items plumbing, sheet metal work, roofing and hardware, are the heaviest contributors to the nation's annual repair bill.

It is estimated that between four and five billion dollars will be spent this year in new construction, a large part of it residential. Of this amount, approximately $240,000,000 will be spent for plumbing, $140,000,000 for sheet metal work, $116,000,000 for roofing, and $48,000,000 for hardware. It is in these items that the largest annual waste for repairs and replacements takes place.

* * *

THE CIVIL ENGINEER AND RADIO

(Engineering and Contracting)

The American Indian is usually taciturn. From which it is perhaps inferable that talking is an art that does not reach perfection among races that live out of doors. Talking has been called the greatest of indoor sports. Certainly the tongue seems to attain its extremes of dexterous flexibility among peoples who abide much under a roof. Since women usually live more indoors than do men, we should expect to find them more addicted to lingual athletics than are men.

Having thus established at least a presumtion that wordiness and indoorness go together, we are better able to understand why relatively few civil engineers are fluent talkers. The life of the average civil engineer, at least during his habit-forming years, is largely a life in the open. If this tends to make him diffident about trying to convey his knowledge to others, it has at least the merit of causing him to keep also his ignorance to himself. And what a wordful of ignorance is daily talked and printed.

There has been not a little worrying over the volume of printed matter that is annually produced. Already the literary accumulation is so vast as to daunt the student who seeks a broad education by reading. And now comes radio, with the promise (or is it not really a threat?) that the frozen language of a million authors be thawed from its print and caused to flow forth in spoken words to every corner of the world. Even the taciturn civil engineer in his quiet con-

struction camp at night is to have lectures and sermons broadcasted upon him. Vanish for him the meditative hours, and in their stead the rattle and roar of talk, the tongue attacks of thousands of trained speakers. No more will future generations be able to say with truth:

Great teachers had I in my youth,
The silent, speaking things of nature,
And solitude that taught me thought.

A SCHOOL FOR APPRENTICES

THE Industrial Association of San Francisco, which has charge of the labor relations of the section of the building industry operating under the open shop, has been giving considerable time to the problem of the shortage of skilled labor, which is becoming nation-wide.

The direct method of dealing with this shortage was considered to be the best one and a trades school has been installed which will eventually provide courses in most of the skilled building crafts.

The first group of student apprentices to be organized is taking up plastering. This class has been holding daily lesson for more than a week and splendid progress is reported.

There were seventy-five applications for training but for the start twenty-five were thought sufficient considering the facilities ready at that time. More will be taken in at the beginning of the next term.

All enrolled students were required to pass the army "beta" psychological test and physical examination as it was not thought desirable to waste instruction on persons incapable of profiting by it.

An allowance for married men of $2.50 a day has been provided but single men are not being paid. Tuition in all instances is free and buildings and working material have been arranged for by the association.

To start the plastering school a structure containing 9,200 feet of floor space was secured. Bays and breasts were constructed in order to provide the maximum amount of wall space and one competent instructor placed in charge of the first class. Another teacher will be added shortly.

The school operates five days a week, eight hours a day. A complete training course of twelve weeks will turn out competent tradesmen according to the schedule laid down. Apprentices not progressing satisfactorily will be given extra consideration until it is shown that they are not suited to the work and then they will be discharged.

Of the twelve weeks included in the course, four weeks will be taken up learning to handle tools. Rough brown plaster will be used during this period and all the various tools in the plasterer's chest will be handled and the students drilled in their use until they become quite proficient. As soon as the wall space is filled up the ornamental division will take up practice. Instruction in running molds, cornices, mitering and other fine work will be given.

High grade white plasters will be used during the last eight weeks and all sorts and grades of material will be discussed and explained to the class.

May 15 the plumbers' school started its course. The schdule for this class has not been worked out as yet and it is thought that more time may be needed to turn out a finished craftsman than with the plasterers.

In a short time schools for painters, bricklayers, tile setters, and metal lathers will be established and plans are already well under way in all of these branches. The experience gained in the divisions now at work and to be soon started will guide the Industrial Association in starting classes in all the other building cratts where shortage is liable to occur.

To Promote Art in Industry.

The question of whether the spirit of living art can be brought into the manufacture of the things of everyday use in America was discussed at a meeting in the Newark, New Jersey, Museum last month. The general opinion was that it could. A committee was appointed to gather information on what is now being done in the United States to promote art in industry. This committee is to report to a meeting later in the year, which will be called to consider plans for the founding of an industrial art museum, and for the organizing of a national industrial arts association made up of manufacturers, artists, designers, craftsmen, workers in shops and factories, and distributors and retailers of manufactured good.

Will Design Federal Hospital

Mr. Matthew O'Brien of San Francisco has been selected as architect for a $2,000,000 hospital for tubercular war veterans, to be built at Livermore. The money for construction was provided by the Langley bill, passed in April, setting aside $17,000,000 for the construction of hospitals for ex-service men. The hospital group includes about twenty-seven buildings.

With the Architects

Building Reports and Personal Mention of Interest to the Profession

Store and Office Building.

Plans have been prepared by Architect William H. Weeks, 369 Pine street, San Francisco, for a $50,000 store and office building to be erected in Watsonville for Mr. Otto Stosser; also a two-story frame and plaster apartment house on College avenue, near Ashby, Berkeley, for Dr. Campbell. Mr. Weeks has been commissioned to prepare plans for the new school buildings at Santa Rosa for which bonds amounting to $375,000 were recently voted. Plans have been completed in the same office for a two-story reinforced concrete domestic science wing to the Mount Diablo Union High School, Concord. This structure will cost $90,000.

Will Judge War Memorial Plans.

Messrs. Ellis F. Lawrence of Portland, W. R. B. Wilcox of Seattle and Bernard R. Maybeck of San Francisco sailed May 31st for Honolulu to act as judges of plans in the architectural competition for the territorial war memorial natatorium to be erected in the Hawaiian capital. This memorial will consist of a natatorium modeled after the Greek pools of antiquity. The Hawaiian legislature has authorized a bond issue of several hundred thousand dollars for the memorial. The architectural adviser is Mr. Louis C. Mullgardt, former San Francisco architect, who is now traveling abroad.

Country House.

Architects Julius Krafft & Sons, Phelan building, San Francisco, have completed plans for etxensive alterations and additions to the country house at Hillsborough for Mr. W. H. Talbot of Pope & Talbot, San Francisco lumber dealers. The style of architecture will be English Tudor and when completed the new home will have forty or more spacious rooms. The same architects have completed plans for a two-story building on Minna street, near Third, for Mr. D. J. O'Neal and for extensive alterations and additions to the Wellman, Peck building. The cost of the latter work will exceed $100,000.

Binder & Curtis Busy.

New work in the office of Architects Binder & Curtis of San Jose includes a six-story class A store, office and club building for the San Jose Commercial Club, estimated to cost $250,000; a two-story reinforced concrete chapel and classroom building for the Christian Assembly, formerly the Home of Truth, to cost $80,000; a two-story reinforced concrete ward building at the County Infirmary, San Jose, to cost $100,000, and a large Colonial residence for Mr. F. A. Wilder of the Pratt-Lowe Company, to cost $25,000.

Mr. Donovan Honored.

Mr. John J. Donovan, Oakland architect, has been invited to give a course of lectures on "The Practical Side of School House Planning" during the summer session of the University of California.

This course is intended for school executives, superintendents, principals, teachers preparing for administrative work, and others interested in the problems of school building. Lectures, discussions and stereopticon views and films of the important details of school building will be used in presenting the problems.

Telephone Building Addition

Plans have been completed by Mr. E. V. Cobby, engineering department, Pacific States Telephone Company, San Francisco, for an additional story to the telephone exchange on Bush street, San Francisco. This addition will provide for one of the most elaborate private cafeterias on the Pacific Coast, having accommodations for 700 girls. Electric equipment will be used throughout, including ovens, washing and drying machines, cooking utensils, etc.

Appointed Assistant Professor.

Mr. James Chillman, Jr., has been appointed Assistant Professor in Architectural Design at Carnegie Institute of Technology, Pittsburgh. Mr. Chillman, for the past three years, has been studying at the American Academy in Rome, as the holder of the Roman Prize Fellowship. His work at Carnegie Tech will begin next September. He is a graduate of Univerity of Pennsylvania in the class of 1914, with the degree of Master of Arts.

Architect Bugbee Busy.

Plans are being completed by Architect Arthur G. Bugbee of San Francisco for a four-story and mezzanine store and office building to be erected on the southeast corner of 22nd and Valencia streets, San Francisco, at a cost of $85,000. The entire ground floor has been leased to an Eastern rug concern. The offices have been arranged for physicians and dentists. Mr. Bugbee has also prepared plans for a large residence for Mr. Taylor, of Taylor & Taylor; alterations to the residence of A. Samuel on Commonwealth avenue and a one-story industrial building on Natoma street for the Bothin Real Estate Company.

Berkeley Architect Busy.

Architect W. H. Ratcliff, Jr., First National Bank building, Berkeley, has completed plans and awarded a contract for a three-story and basement frame and stucco apartment house for Mrs. A. B. Pray, to cost $35,000, to be erected on Piedmont avenue and Dwight Way; also a large residence in Claremont for Mr. Sumner Clement to cost $15,000; a store building on Telegraph avenue at Channing Way to cost $35,000, and a two-story reinforced concrete private school building at Harold Way and Kittredge street, Berkeley, for the Armstrong School for Private Secretaries. The latter building will cost $85,000.

New Catholic College.

Plans are being prepared by Architect Leo J. Devlin, Pacific building, San Francisco, for a large fireproof college building and dormitory to be erected near Mountain View, Santa Clara county, for the College of St. Joseph of Cupertino. The building will contain over 50,000 square feet of floor space and will have 400 rooms. The cost of the improvement is estimated at $1,250,000.

Granted Certificates.

The State Board of Architecture has granted certificates for the practice of architecture to Viggo A. Hansen, with Stanton, Reed & Hibbard, 622 Metropolitan building, and to Harry McAfee of Swasey & McAfee, architects, 1018 Hibernian building, Los Angeles.

State Board Elects Officers.

At the meeting of the California State Board of Architecture held in Los Angeles May 11th and 12th the following officers were elected:

Clarence R. Ward, president; W. J. Dodd, vice-president; A. M. Edelman, secretary and treasurer; Sylvain Schnaittacher, assistant secretary and treasurer.

Los Angeles Synagogue.

Architects A. M. Edelman and S. Tilden Norton of Los Angeles have been commissioned to prepare plans for a $500,000 synagogue to be erected on the northeast corner of Wilshire street and Hobart boulevard, Los Angeles, for the Congregation B'nai B'rith.

Opens Fresno Office.

Architect E. W. Peterson has opened an office for the practice of the profession in the Cory building, Fresno. Mr. Peterson reports that he is quite busy preparing plans for several school buildings and churches in Fresno county.

Will Design Stockton Auditorium.

The architects who have been selected to prepare plans for the new municipal auditorium at Stockton have organized and will carry on the work under the name of the City Architectural Commission, with Messrs. Glenn Allen, president W. J. Wright, vice-president, and Louis S. Stone, chairman of the executive.

Designing Hydro-Electric Plant.

Engineers Ellery, Frost & Patten, Merchants National Bank building, San Francisco, are preparing plans for a 200,000 horse power hydro-electric plant at Auburn for the American River Water & Power Company. Plans call for a dam 120 feet high, a power plant, 12 miles of log flume and considerable irrigation pipe work.

Attend National Convention.

The Pacific Coast delegation to the American Institute Convention in Chicago included Architects W. B. Faville who was elected president, and J. S. Fairweather of San Francisco; Harlan Thomas, F. A. Naramore, J. H. Schack and Chas. H. Alden, all of Seattle, and the following from Los Angeles: Messrs. Edwin Bergstrom, A. M. Edelman, Myron Hunt, Reginald D. Johnson, Sumner Hunt, Chas. F. Plummer, Harwood Hewitt, F. Pierpont Davis and R. Germain Hubby.

Oakland Skyscraper.

The Tribune Publishing Company has announced that it will erect the tallest business building in Oakland. While the structure will cover a small ground area, it will be at least eighteen stories in height or two stories taller than the new building under construction for the Oakland Bank of Savings. Mr. Edward T. Foulkes, Crocker building, San Francisco, is the architect.

Architects Visit San Diego.

Members of Southern California Chapter, A. I. A., held their May meeting in San Diego, and after lunch the visitors enjoyed a trip to Tiajuana. The evening meeting, held at Hotel San Diego, concluded the program. Addresses were made by Messrs. Edwin Bergstrom, Sumner P. Hunt, Wm. Templeton Johnson, Wm. H. Wheeler and Eugene M. Hoffman.

The members and guests present were: Messrs Edwin Bergstrom, Wm. M. Clarke, R. Germain Hubby, Sumner P. Hunt, Chas. F. Plummer, Alfred W. Rea, J. T. Zeller, Walter S. Davis, W. Asa Hudson, Scott Quintin, Donald R. Wilkinson, Lloyd Rally, L. J. Zeller, Sylvain Schnaittacher, Wm. Templeton Johnson, Wm. H. Wheeler and Eugene M. Hoffman.

Carnegie Professor Honored.

Professor Harry Sternfeld, acting head of the Department of Architecture, Carnegie Institute of Technology, Pittsburgh, recently received a medal and diploma awarded by the Pan-America Congress of Architects that met in Montevideo, Uruguay. The award was made in recognition of work done by Mr. Sternfeld in the field of Architecture.

San Luis Obispo Hotel.

New work in the office of Architect C. A. Meussdorffer, Humboldt Bank building, San Francisco, includes a five-story reinforced concrete store and hotel building for Mr. J. L. Anderson of San Luis Obispo, to cost $200,000, and a ten-story class A apartment house at Greenwich and Hyde streets, San Francisco, for Mr. O. B. Martin, to cost $200,000.

Fresno Apartment House.

Messrs. Lewis & Ellery, Merchants National Bank building, are completing plans for a $75,000 brick veneer apartment house to be erected in Fresno for Mr. W. J. Whitney. The same architects are making plans for a Christian Science church in Hayward to cost $15,000.

Sacramento Bank Building.

The K. E. Parker Company of San Francisco submitted the low bid for the construction of a branch bank building at 6th and K streets, Sacramento, for the Bank of Italy. The building with mechanical equipment and fixtures will represent an outlay of $250,000.

$200,000 Church.

Plans have been completed and a contract has been let for a four-story steel frame church building at Tenth and Figueroa streets, Los Angeles, for the Emanuel Presbyterian Church. Mr. C. F. Skilling is the architect.

Where to Find Out About Zoning.

The Department of Commerce, in response to the needs of over 60 cities in which zoning is in effect, and of over 110 cities which have zoning ordinances in preparation, has just issued A Selected Bibliography of Zoning. This contains critical references to the most important articles on the subject which have appeared in periodicals and books. Special sections are devoted to the arguments for and against zoning, to the legal aspects of zoning, and to such technical matters as the relation of city planning to zoning, the different types of districts, and agencies and administration for zoning.

The bibliography may be obtained by application to the Division of Building and Housing, Department of Commerce, Washington, D. C.

Wireless Equipment for Office Building.

The establishment of the most modern and powerful broadcasting and receiving station that can be obtained on top of its building now under construction at Market and Main streets, San Francisco, and the wiring of all offices in the fifteen-story structure for radiophone installation, was recently announced by the Matson Navigation Company.

There will be several hundred offices in the Matson building and those of the tenants who install radio reception sets will have only to plug in at a connection that will be in each room to "listen in" to the concerts being broadcasted every day by stations throughout Northern California.

The Matson is said to be the first skyscraper on the Pacific Coast to make provision for wireless telephone conveniences for its tenants.

Addition to Mercantile Building.

Architect A. A. Cantin of San Francisco has completed plans for a $60,000 three-story addition to a large mercantile building on Sacramento street, covering ground area 25x120. Mr. Cantin has also prepared plans for a Spanish bungalow to be built on his ranch near Mountain View, Santa Clara county.

Salvation Army Building.

Architect Arthur S. Heineman, San Fernando building, Los Angeles, has completed plans for a seven-story class A hotel of 135 rooms for the Southern California division of the Salvation Army. The building will cost $175,000.

College Library Building

Architect Myron Hunt of Los Angeles is preparing plans for a library building for Occidental College to cost $100,000.

Form Partnership.

A partnership for the practice of architecture has been formed by Mr. John H. Powers and Mr. John H. Ahnden, former head draftsman for Messrs. Bakewell and Brown and Mr. Henry H. Meyers, with offices at 460 Montgomery street, San Francisco. Some of the work which they have under way includes a $50,000 apartment house on Leavenworth street, near Eddy, for Mr. C. F. Ernst, a reinforced concrete machine shop on Folsom street for Mr. E. T. Meakin, a commercial garage in San Jose and a large store building in Palo Alto.

$35,000 Apartment House.

Architect E. Geoffrey Banks, First National Bank Building, San Francisco, has prepared plans for an attractive frame and brick veneer apartment house having eight apartments of four and five rooms each, for Mr. R. C. Ogden. It will be erected on 29th street, just off of Webster, in Oakland, at an estimated cost of $35,000.

Commercial Garage.

Architect H. C. Baumann of San Francisco has completed plans for a large reinforced concrete commercial garage for Mr. Frank Clark. The building will be erected on the southwest corner of Divisadero and Grove streets, San Francisco, and will cost $35,000.

Office and Loft Building.

On Sacramento street, near Battery, San Francisco, H. & W. Pierce, Inc., will erect a three-story and basement class A office and loft building, from plans by Architect B. G. McDougall, Alto building, San Francisco.

Community Apartment House.

Plans are being completed by Architect H. P. Merritt and Engineer C. H. Snyder of San Francisco, for an eight-story class A community apartment house at Sacramento and Mason streets, San Francisco, to cost $1,000,000 or more. Construction will be in charge of Marcus Marcussen.

Los Angeles Building.

Architects G. A. Lansburgh and S. Heiman, associated, are preparing plans for a four-story and basement class C store and office building for Messrs. E. Tropp and W. C. Crittenden. Building will be located on Hill street, north of Eighth, Los Angeles, and will cost $350,000.

State Printing Building.

Plans have been completed by the Architectural Department in the State Engineer's Office, Sacramento, for the new State Printing Office building to be erected at 11th and O streets, Sacramento, at a cost of $240,000.

Words of Praise.

The following letters speak for themselves, being two of many similar communications which the publishers have received of late and indicating the regard with which this magazine is held by contractors as well as architects:

Plans and Estimates Work Guaranteed

K. C. HINKLE
CONTRACTOR AND BUILDER
ESPARTO, CALIFORNIA

May 16, 1922

The Architect and Engineer,
625-6-7 Foxcroft Bldg.,
San Francisco,

Dear Sirs: Enclosed find check for $2.50, for which please send me The Architect and Engineer for one year. I am also enclosing a letter from a friend which refers to your magazine. Thought it might prove interesting to you to know how at least one builder regards your work.

Yours truly,
K. C. HINKLE.

D. FENTON
CONTRACTOR AND BUILDER
173 West Court Street,
Phone 180-W.

Woodland, Calif.,
April 27, 1922.

Mr. K. C. Hinkle,
Esparto, Cal.

Friend Hink: Have been thinking I could come up and spend a day with you, but it seems most impossible, as you know there is always something turns up to prevent. However, whenever I have anything which I think good I like to share it with my friends. I had occasion to call on one of the leading architects of Sacramento sometime back and while there I noticed a book which he had just been reading; it is called The Architect and Engineer, so I quietly took the address and subscribed for it. Well, Hink, I think it is the greatest book I have ever gotten hold of for our business. Just what we want to keep us brushed up to the times, so I am asking you to be sure and subscribe for it. If you do, start with the April number. I started with the January number. I am sure you will like it as it will be a wonderful help to you, as you can find in it anything you can possibly need in the building line and at the same time tell you just where to get it. It also gives prices of various things and of all classes of labor. The beauty of it—it is published in 'Frisco. It also contains much reading in regard to construction—articles written by the leading engineers and architects of the coast.

Yours truly,
DEL.

Address: The Architect and Engineer, 626 Foxcroft Bldg., San Francisco.

$2.50 per year.

If you haven't it for the Lord's sake get it.

P. S.—Business is good, will be better when you let loose of those lathers. Ha!

Heat Buildings—Cool Buildings Next

A San Francisco man, Mr. Willard W. Brown, well-known manager of the Feather River Inn, has secured patents on an invention which promises to command world-wide attention. Mr. Brown proposes to utilize the steam heating pipes in hot weather to distribute process-cooled air. It is claimed that by its use a temperature of seventy degrees can be maintained in buildings in the hotest tropical regions or the Orient. The invention has been installed in the United States Senate Chamber at Washington with very satisfactory results, it is said.

With the Engineers

Let Public Know What an Engineer Is

WRITING to "Engineering and Contracting" on the subject of "Greater Publicity for the Engineer," Mr. E. T. Delery of New Orleans offers the following suggestions:

"It appears to me that a good plan would be to have civic bodies who are interested in improving conditions, have one of their members write a well-thought-out and carefully prepared paper on the matters in which they are interested, take the matter up with the officers of the local engineering society and read it at one of their meetings.

"What our engineering societies have been doing, in some measure, and what I think they should concentrate on, is to educate the public as to just what an engineer is. Most people think that an engineer can do no other thing than design structures, machinery and other devices, or make maps and surveys. What they do not seem to understand is that the chief function of an engineer is to conceive, finance, organize, design, erect and, last but not least, economically operate public works.

"In many places we find waterworks, sewerage and drainage systems being operated under the charge of men not conversant with the essential principles of engineering. There are many cities in which the health board is made up entirely of doctors and civilians. Now it is very well for medical men to find out what is desirable for the health of a community, but it is absolutely up to an engineer to decide how the remedy is to be applied, with the funds available, and to decide what funds are needed. In many cases the advice of an engineer in financial matters would be of decided advantage to public boards because of his natural tendency toward the conservative side of all financial transactions.

"It would be well for communities if the administrative head of all departments doing construction or maintenance work was a thoroughly qualified engineer of acknowledged standing. Furthermore, he should be untrammeled by partisan politics. Unfortunately, this is not likely to be permitted.

"I believe that if it were possible for the engineering societies to organize small active units (committees) who would constantly keep before the legislature and governor of each state the necessity of appointing on all public boards at least one engineer who would be a member of the board, not an employe, then the engineer would, indeed, get into a position in which he could do most for his community and gain the recognition which he deserves.

"I believe that if it were possible to keep city engineers and engineers in charge of other public boards free from political entanglements and undue influence, all public works would be conducted on a much more economical basis than is at present usually possible. This is a matter which is up to the voters of the community. If, as usually happens, most of the business men of a community are so engrossed with their personal business that they cannot find time to register or to vote more than once in several years, then the responsibility rests with them and what happens due to the politicalization of public works, is beyond anything that the engineering societies can correct.

"When the public awakes to the necessity of placing in charge of public works only men who have been trained to handle large engineering problems, then, and only then, will they reap the harvest of benefits which economical construction and operation can produce. In the meanwhile, all that the engineering societies can do is to so organize and co-operate that the benefits of engineering knowledge and training on public boards shall be persistently and forcibly brought to the attention of our governors and legislatures."

Road Building Experiments

The California Highway Commission, jointly with the U. S. Bureau of Public Roads, also with the co-operation of the Columbia Steel Company, in the use of its property, is to continue to completion the Pittsburg highway tests started last spring by the company to investigate the strength of different types of concrete highways, with particular reference to the effect of reinforcing steel. At the conclusion of the tests already instituted, the Commission and the Federal Bureau expect to start an entirely new series of tests on the same ground which has been offered for the purpose by the steel company.

The fact that expenditures for highways in the United States last year amounted to approximately $600,000,000, an amount which places

road building among the big industries of the country, justifies a considerable expenditure for experiment to determine just how they should be built to meet the needs of the ever increasing traffic.

When riding over a finished road very few people think of the problems, many and varied, which its building gives rise to. For instance, the cost of oil, gas and repairs, for motor vehicles can be varied by simply changing the location, the curves or the grades. The type of surface also must be considered in the economic operation of vehicles. Problems also arise in connection with the materials and methods of construction and maintenance of the surface. There is also the proper selection and design of the surface which includes consideration of the subgrade.

Problems of interest to a certain locality are usually investigated by the various state highway and educational institutions throughout the country, the Bureau of Public Roads co-operating by way of furnishing part of the personnel and special instruments and equipment. At present, there are in progress eight investigations of this character ranging in size from small laboratory tests requiring but one investigator and little equipment, to experimental roads like the Pittsburg highway, requiring a corps of research engineers and expensive equipment and apparatus. These activities show that the country has gone into the road building business in earnest and should give assurance that the great mileage of roads to be built will be the best and most economical that science can develop.

Consolidated Service Bureau.

The San Francisco Engineering Council has taken up the local employment situation as it affects engineers. A committee has been appointed consisting of Messrs. W. H. Phelps, chairman, W. W. Hanscom and Walter Stalder, to investigate the subject of unemployment in the engineering profession. A thorough study has been made by the committee which recommends that a consolidated service bureau be established in San Francisco for the purpose of receiving and filling openings for the services of members of the various societies.

The report has received the approval of the members of the council and the secretaries of the representative societies have been organized into a committee to draw up a proposal for financing and operating such a bureau.

Donald M. Baker Resigns.

Mr. Donald M. Baker, hydraulic engineer for the Bureau of Water Rights, has resigned as a director of San Francisco Chapter, American Association of Engineers, on account of the recent removal of the bureau to Sacramento.

Mr. Albert N. Johns has been appointed by the chapter to fill the vacancy on the board.

Concrete Product Association.

For the purpose of standardizing the quality of concrete products made and used in Southern California a new organization has been formed under the name "The Concrete Products Association of Southern California." This association, which was organized recently at a meeting held at the headquarters of the Portland Cement Association in Los Angeles, will automatically become a local branch of the national body, with headquarters in Chicago.

"The purpose of this association," said President Watkins, "is to establish a definite and standard quality in the manufacture of all concrete products, which includes building units, architectural stone, art concrete, concrete hollow tile, concrete blocks and concrete bricks, and to give the consumer a finihed product that will continue to live up to the slogan of 'concrete for permanence.' We have accepted as a standard the American Concrete Institute specifications which are now the basis of building codes in most American cities."

Road Types on Lincoln Highway.

On February 1, 1922, the mileages of the various types of road construction on the Transcontinental Route of the Lincoln Highway, New York to San Francisco, were as follows:

	Miles
Concrete	521
Brick	241
Bituminous macadam	383
Macadam	287
Asphalt	78
Creosote block	5
Granite block	7
Graded gravel	1,052
Natural gravel	62
Graded earth	526
Natural earth	136
Sand	3

Valuable Stock Bulletin

Users of construction equipment and machinery will be interested in the Priced Stock Bulletin just issued by the Smith-Booth-Usher Company of Los Angeles and San Francisco.

In line with the policy of that company, the price of each stock item, and this means something over 1000 machines, exclusive of supplies, is shown together with the stock location (Los Angeles or San Francisco).

The completeness of the Smith-Booth-Usher Company's stock as shown in this Priced Stock Bulletin is very impressive and as a "Buyer's Guide" the Bulletin should prove invaluable.

The Contractor

When a Contractor Buys Lumber.

WHEN a contractor buys lumber he wants what he buys. When a car is billed 3,000 feet short and the grade is below the contractor suffers. Such suffering has not been uncommon. Accordingly, a conference to the point taken part in by Secretary Hoover at the National Lumber Manufacturers' Association convention April 6 is of interest.

In the early part of the discussion, Mr. Hoover was told by Mr. Hines of the Edward Hines Lumber Company, Chicago, that the Chicago Lumber Dealers' Association have subscribed to the following principles:

"They will have their inspectors to inspect lumber in any part of the city; they will see that the lumber is according to grade; they will see that the contractors, the architects, and the public if any questions come up, have an inspection right in Chicago."

Mr. Hines said, "That will protect the public and will also protect the retailer from the ones who are pursuing bad practices. Of course, you can appreciate that in competition, the man who is honest cannot compete with a dishonest man. Some cars of lumber arriving in Chicago were billed short 3,000 feet on every car. The grade was always below."

Mr. Hines then read resolutions passed by the Southern Pine Association at their recent convention in New Orleans, which are as follows:

1. The committee recommends the grade marking of lumber as a means of protecting lumber buyers.
2. The committee recommends that lumber be marked with the name of the grade, or such abbreviation thereof as it may be practicable to use.
3. The committee recommends that the number of the mill, to be designated by the Southern Pine Associatoin, be shown on the lumber in connection with the grade mark.
4. The committee recommends that the board of directors authorize the secretary-manager to solicit suggestions for mechanical or other means of stamping, printing or impressing grade marks upon manufactured lumber.
5. The committee recommends that the board of directors be requested to obtain the opinion of counsel to ascertain whether or not the Southern Pine Association can legally recommend the adoption by its subscribers of symbols or grade marks, to be used by them in connection with marks designating the number of the mill and the grade.
6. The committee recommends that the directors instruct the secretary-manager to address an inquiry to the association subscribers asking whether or not they will be willing to adopt the practice of grade marking.
7. The committee recommends that when 50 per cent of subscribers shall have indicated their willingness to join in the movement of grade marking lumber for the protection of the buyer, that the directors authorize the issuance of a list of such mills in alphabetical order showing the number assigned to each mill and to furnish such list to all buyers of lumber.
8. That subscribers be urged to place in each car of lumber loaded by them a card showing tally a piece and grade of the material loaded therein.
9. That buyers, when desiring to ascertain the mill by which a certain shipment of grade marked lumber has been made may apply to the association for the same.

Mr. Hines: If such resolutions are complied with a very large means of protection to the buyer can be obtained, because there will be shown on every car a piece tally of the contents of the car. The public will be advised, all over the United States, when a carload of lumber is shipped, the mill shipping that lumber will have in the car, in a conspicuous place, the contents of the car, both in grade and feet, and that will really afford the buyer protection to a large extent. In addition to that, in my opinion, the retailers of the United States would welcome co-operation with the manufacturers so far as protecting the real ultimate consumer of lumber. I think we can secure the active and immediate co-operate of the Retail Lumber Associations of the United States. If that is done, the ultimate consumer will be, for the first time, actually protected in the buying of his material, whether he buys 500 feet or 5,000,000 feet.

The Chairman: While you are on your feet, Mr. Hines, I would be glad to have you give the secretary your views on the appointment of inspectors by the National Association.

Mr. Hines: That is the most practical way of protecting the public. First, the National Association would be held responsible for the honesty of the inspector, and second, for his being a practical man and the issuance of a certificate backed by the National Association certificate of the contents of a certain car, that it contains so much lumber and that it contains the particular grade for the purpose desired. Is that the point?

The Chairman: Yes, that is the point.

Secretary Hoover: Is it feasible to stamp the board contents on each stick?

Mr. Hines: No, that is not feasible. The important thing is to have the grade shown. That is very practical. We are doing that now in export lumber. The grade is marked. If it can be done for export it can be done for domestic use. That is not so much to protect our industry as to protect the public.

Secretary Hoover: Would you propose to have the national inspector subject to the call of the consumer?

Mr. Hines: Absolutely. For instance, each regional association would have their particular inspector for their species of wood. If any question came up anywhere the public would have a right to call for an inspector, whether for yellow pine or anything else. The public would be shown that the National Association is back of the inspection, and you can appreciate that it would be difficult to get an inspector who could grade eight of ten different kinds of lumber, but on the coast they could have an inspector of hemlock, fir and so forth.

Secretary Hoover: Suppose there were a dispute which the inspector decided in favor of the shipper, what recourse would the consumer have?

Mr. Hines: In our experience we have never known a case where the licensed inspector graded lumber but where the public was satisfied, and I presume we have had over 1,000 cases in different kinds of woods. In the first place, the inspector is practical; second, our rules for grading lumber are so plain that if a man is reasonably acquainted with the grades, he knows the licensed inspector is doing full justice. We have found that the National inspectors have leaned a little backward against the mills. I am speaking both as a buyer and a seller. We have a number of yards in Chicago, and we buy forty or fifty cars a day. We have had differences with other mills, but we have the first case to find that the inspector has not done us full justice. That statement will be endorsed by all of the lumber yard leaders of the city of Chicago, and I am positive it will be endorsed by the entire retail trade of the States.

Secretary Hoover: Do you think it necessary to introduce some idea into the lumber contract that makes such a contract, in case of a dispute, subject to inspection?

Mr. Hines: That would be an excellent idea. I would welcome that, both as a manufacturer and a buyer.

The Chairman: We have not resorted to that, Mr. Secretary, because we are only one party to the contract. As I understand, where there is an official inspection, both parties to the controversy join in submitting the matter to arbitration, so that the decision of the arbitrator is final and binding on both parties.

Secretary Hoover: How far do you think that this idea can be adopted?

The Chairman: My own thought is that it can be made universal.

Secretary Hoover: And it would apply to mills which are not members of the Association, as well as to those that are, if the outside mills don't want to take membership?

Mr. Hines: My idea is this: The mills outside of the Association would very quickly appreciate the protection they have, which is in the form of an insurance policy that would be written by the Association, and they would come into the Association, and when in the Association they would be obliged to subscribe to certain honest principles which we stand for. So I think we would be doing both the manufacturer and the public a real good and our business would be better understood by the public.

To Simplify Building Material.

Simplification of building materials as a means of eliminating waste in industry was discussed at a recent conference held between officials of the U. S. Department of Commerce and representatives of architectural, engineering and building organizations.

The work of the meeting may be summed up in the following resolution which was adopted:

"Whereas, the undersigned committee of architects, contractors and engineers are fully in accord with Secretary Hoover's program for elimination of waste as a major means to the stimulation of American business, and

"Whereas, prominent among the many factors which contribute to such waste in building as evidenced by the high cost of construction are the multiplicity of types and the great variety of dimensions which now abound in many of the component parts which enter construction; and,

"Whereas, the cost of construction will undoubtedly be thereby lessened, the industry stimulated, and interest of the public conserved by dimensional simplification; be it

"Resolved, that this committee formed to discuss the subject of dimensional simplification recommends to the Department of Commerce that the Division of Simplified Practice study certain essential parts of construction with a view to simplifying the types and lessening the number of different dimensions of those parts."

In selecting the items of building materials to be given attention first, the following were designated: millwork, plumbing, heating, interior wall construction, hardware, lighting fixtures, clay products, the latter including brick, tile of all kinds, terra cotta, sewer pipe, etc.

In giving these items attention, the department will formulate sub-committees to bring together the manufacturers and others having to do with each particular commodity or service.

Designing San Diego Theater.

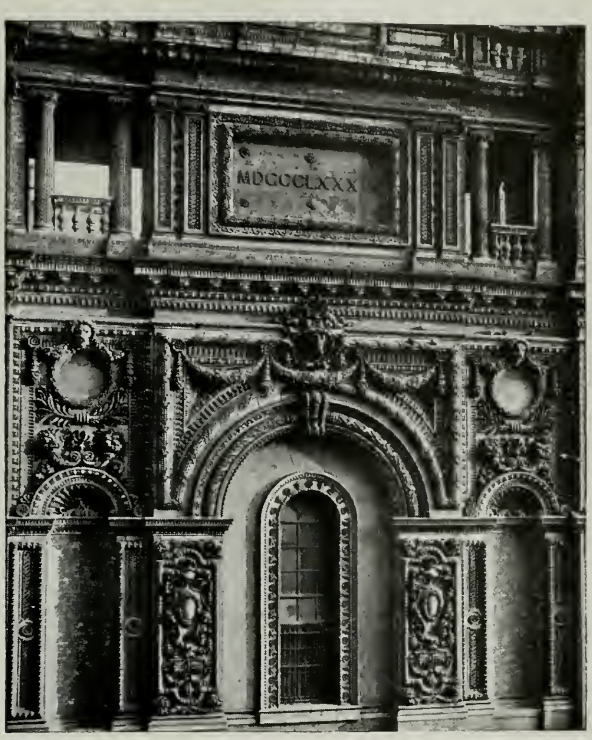
Architect B. Marcus Priteca, Pantages Theater building, Seattle, has been commissioned to prepare plans for a seven-story class A theater and office building to be erected at San Diego for Messrs. Richard T. Robinson, Jr., and Robert Blankenship.

COMBINED PLANTS OF PACIFIC SANITARY MANUFACTURING COMPANY

Plumbing Industries Merge.

With the consolidation of the three pottery and porcelain plants of the Pacific Manufacturing Company and the Pacific Porcelain Ware Company of Richmond, California, and the incorporation of a new company under the name of The Pacific Sanitary Manufacturing Company, with a capitalization of $2,000,000, the Pacific Coast can claim one of the world's largest plumbing fixture industries. The new company is financed by the same people who owned the other two organizations and there will be no change in management, Mr. N. W. Stern remaining president, Mr. M. E. Wangenheim, vice-president, and Miss F. Mayblum, secretary.

The three plants had previously operated as separate units in the manufacture of a line of plumbing fixtures, which were marketed through a jointly operated selling organization. This sales organization now becomes part of the new company. Extensive additions to the three plants are already under way and plans for handling a nation-wide trade are well matured.



Detail of Terra Cotta construction and ornament, Madison Square Garden, New York City, McKim, Mead and White, Architects.

Unretouched photo showing condition of Terra Cotta, March 1st, 1922

A 33-YEAR TEST

MADISON SQUARE GARDEN affords convincing evidence of the *durability* of Terra Cotta. After thirty-three years' exposure to climatic action its Terra Cotta is in perfect condition throughout.

This example, one of many in all parts of the country, attests the absolute permanence of Terra Cotta when its use is intelligently conceived and its installation properly supervised. Northern Italy and France carry the demonstration further in many instances of over 500 years' standing.

Correct detailing of terra cotta and proper related construction will insure this result.

Send for our reference work, "Terra Cotta Standard Construction," a volume of seventy plates of typical details; free on request to architects, engineers, draftsmen and students of recognized professional schools.

Address: **National Terra Cotta Society,** 19 West 44th Street, New York City.

TERRA COTTA

Permanent *Beautiful* *Profitable*

Pumps for Buildings

The Pelton Water Wheel Company, 19th and Harrison streets, San Francisco, which has for several years manufactured a line of centrifugal pumps both for irrigation and various types of heavy-duty service, has recently increased its activities by bringing out its type FD pump. This type is specially designed for efficient operation under the ordinary requirements for tank supply and similar service, such as the delivery of a small quantity of water against a relatively high head.

Both two-stage and four-stage designs are manufactured, the former being recommended where the total head does not exceed 125 feet, and the latter for higher heads. The casing is split vertically to permit easy access to the rotating elements. The housing and base for both the outboard and the inboard bearings are cast integral with the inside coverplate of the pump. This type of construction not only insures permanent accurate alignment of the shaft, but also makes possible the use of an overhung pulley and consequently the easy conversion of the pump from belt to direct drive or vice versa.

Although this line of pumps has been on the market only a short time and until recently no great effort was made to push their sale, a considerable number have been placed. In the Mattei building at Fresno, a four-stage pump has been in service for a little over a year, while in the Sherman Clay building and the Newhall building in San Francisco there are two-stage pumps. The service expected of these pumps, as well as a number of others, is taking water at city pressure and "boosting" this to the required pressure. In the Mattei building water can be taken from a surge-tank as well as from the city mains. This double requirement calls for a pump of great flexibility.

Other pumps of this type, however, such as the four-stage pump of the Francis Water Co., of Ferndale, are used as a primary source of supply, and operate against a suction as well as a discharge head.

The type FD model, like the other pumps of the company's line, is distributed both by the company itself and also by about fifty dealers at various points throughout the Pacific Coast States.

To Design Federal Bank.

Architects Whitehouse & Price of Spokane have been commissioned to prepare plans for the Federal Land Bank's new building in that city at an estimated cost of $100,000.

The "Perfection" Wall Bed

Mr. Leverett T. Spaulding announces a change in the firm name of Spaulding and Monks to Leverett T. Spaulding with offices and salesrooms at 1041 Mission street, San Francisco.

Mr. Spaulding is optimistic over the future of the wall bed market as practically all the new apartments, hotels and flats now under construction have been designed to conserve space. "Perfection" wall beds make two rooms out of one and this type of bed is becoming most popular for small residences.

The "Perfection" bed, sold by Mr. Leverett T. Spaulding, is strong, beautiful and durable. Its construction is substantial with little or no strain, whether in use or in retirement. The materials used are the best the market affords and there is nothing about the bed to wear out. For this reason the investment in a "Perfection" bed is permanent with no outlay for upkeep. The action of the bed is quiet, accurate and graceful and when in use rests on four positive legs like any ordinary bed. The "Perfection" offers a variety of installations so that in material and style it may be made to harmonize with any scheme of furnishing.

The complete line of "Perfection" wall beds can be seen at the company's salesrooms, 1041 Mission street, San Francisco.

Timber Preservation Grows.

The increased demand for permanent timber structures is shown in a recent report of the Service Bureau of the American Wood-Preservers' Association.

Over 2,400,000,000 board feet of timber for various purposes were pressure treated in 1921 by the 122 wood-preserving plants in operation throughout the United States, thereby surpassing the 1920 record by nearly 17 per cent. Approximately equal amounts were treated with coal-tar creosote and with zinc chloride, the standard wood preservatives.

Ease of handling and the permanence of well-treated wood at low cost are given as the reason for the increased demand. The proper use of a wood preservative adds a new quality to timber which enhances its value as a construction material.

The material treated consisted mainly of construction timbers for wharf, bridge, highway, mining and building purposes, piling, telephone and power poles, ties, fence posts, wood blocks for street paving and for factory floors, and timber for miscellaneous uses.

Has New Vice-President.

Harvey Hubbell, Inc., of Bridgeport, Conn., announce the recent election of Mr. Harry F. Bliven as vice-president of the company.

For more than twenty years Mr. Bliven has been general sales manager of the company, and as vice-president is to continue in charge of sales.

Although extremely reticent about himself, it is known that Mr. Bliven, like the organization with which he has had such a long and successful affiliation, is thoroughly a product of Connecticut. He was born at Windham, in the eastern part of the state, on September 27, 1871, and graduated from the Willimantic High School. His earlier experience in the electrical field comprised eight years as salesman with the Western Electric Company, terminating in 1904, when he left to join the Hubbell forces.

L. A. Norris Retires.

Mr. L. A. Norris, who has followed the building business in San Francisco for fifteen years or more as head of the L. A. Norris Company, distributors of Clinton welded fabric and wire lath and also as one of the organizers of the Clinton Contruction Company, has turned over the business to the Wickwire Spencer Steel Corporation, 111 Townsend street, San Francisco.

Residence Addition.

Plans for extensive alterations to the residence of Mr. William Sproule, president of the Southern Pacific Company, have been prepared by Architects Bliss & Faville of San Francisco.

Personal.

Mr. W. F. Staunton, Jr., has opened an office for the practice of architecture at 200 Consolidated Realty building, Los Angeles.

A New Steel Sash Chain.

The Smith & Egge Manufacturing Company of Bridgeport, Conn., originators of sash chain, are manufacturing an improved steel chain for sash weighing not more than 100 pounds and it promises to be as popular as other brands of chain which this company has been producing for many years. It is known as the S. and E. 00 sash chain and is made from the best cold rolled steel .035 thick and the style of the link has been fashioned so as to get the greatest tensile strength. The makers guarantee the tensile strength to be 250 pounds and recommend this chain for sashes weighing up to 100 pounds. The plain steel chain has a fine finish, and may also be had in both copper plated and sherardized finishes at a slight advance in price.

While this chain was designed for sash chain, there are many other ways in which it can be used. The style and shape of the link give the chain a very artistic appearance.

The Pacific Coast distributors of Smith & Egge products are Messrs. Rawlins & Smith, 507 Mission street, San Francisco, and 515 I. W. Hellman building, Los Angeles.

Le Brun Traveling Scholarship Competition.

The Le Brun Traveling Scholarship for 1922 has been awarded to Mr. Lionel H. Pries of Philadelphia, from a field of thirty-three competitors from all parts of the United States.

The quality of the designs submitted was unusually high and the solutions varied. The winner receives $1400 to enable him to travel abroad for the purpose of study. In addition to the prize, the jury gave mention placed first to Mr. George K. Trautwein of Philadelphia; mention placed second to Mr. John O. Vegezzi of New York City and mention placed third to Mr. Paul Hyde Harbach of Buffalo. Mentions not placed were awarded as follows: Mr. George N. Pauly, Mr. Roy F. Larson, Mr. Gerald K. Geerlings, Mr. Louis Fentor, Mr. Roy Walling Cheesman and Mr. Frederick Ross Lorenz.

This prize was founded by Mr. Michel Le Brun in 1910, and was originally awarded every other year, but recently Mr. Pierre Le Brun has increased the endowment so as to enable the New York Chapter, American Institute of Architects, trustees of the fund, to award it annually. The jury of award was composed of Mr. Pierre N. Le Brun, ex-officio; Mr. Milton B. Medary, Mr. Henry Bacon, Mr. Louis Ayres, Mr. Laurence F. Peck, Mr. Francis Nelson and Mr. Julian Clarence Levi, chairman.

"Snowballing" by the Unions.

"'Snowballing' seems again to be in season in New York City," says the American Contractor. Bricklayers and plasterers have quit work on jobs for the purpose of getting their wages raised. And they have succeeded in getting them raised. Outside of the fact that such tactics prove there must be considerable building going on, the news is disheartening and disgusting. Men should stick to their contracts. We shall witness more snowballing before the season is over unless activities of the rail unions and the coal miners put a premature end to activity. * *

In the construction industry, we can learn many a lesson from the coal mines and from the railroads. We can learn from the mines to avoid seasonal activity as much as possible. We must learn to circumvent conditions which make for a big excess of men one month and a scarcity the next month. Right now we are crossing the line from too many to not enough and there will be snowballing. Where, oh, where are the apprentices who will make the adequate supply of men for tomorrow. Unless we get them, there is going to be a regular snow slide some time which will make present snowballing look like kid play. * *

Improved effective equipment will be the advantage of the contractor even more so than now, the minute there is a shortage of good skilled workmen. It is a part of the "team" which will drive through the job to a successful conclusion as far as the ledger is concerned. While railroads are not jammed with freight, while equipment manufacturers are not behind hand on orders is the strategic moment to slip in the order for equipment which will fit into the organization. There is never a time to buy equipment which does not so fit. There is one advantage the contractor has in buying which too often is not appreciated. That advantage is the willingness of the average manufacturer to discuss frankly and at his own expense, how his particular equipment does fit in. This is a real service and should so be considered. Just think back twenty or thirty years how service on the part of the manufacturers as well as the effectiveness of the equipment offered differed from now.

Wall Board Plant

Mr. William B. Thurman, president of the California Cedar Products Company, announces that his firm has just established a new wallboard plant south of Stockton. The new enterprise entails a capital of $50,000.

THE AMERICAN ART ANNUAL,

a book of 680 pages with seventeen full-page illustrations, issued by the American Federation of Arts, Metropolitan Museum of Art, New York.

This is the only publication of its kind and takes rank among the leading directories of American art activity. It contains information concerning all phases of art in the United States; the opening article, "The Year in Art" gives a summary of the leading events in this field during the entire year.

With this issue the American Art Annual rounds out its eighteenth year, marked by an outstanding feature in the additional section, "Who's Who in Art," a biographical directory of over 5,000 living American painters, sculptors and illustrators, writers, lecturers, a list which is unique and should be of great service to those personally interested or financially concerned with art matters.

There are given reports of art museums and art societies, and a list of over 250 art schools, giving curricula, etc. Also, there is a necrology of the art world for the year.

Of particular interest to collectors, museums and dealers is the section devoted to auction sales of paintings, drawings, prints and sculpture which contains a complete listing of items in these fields of art, with details as to artists, owners, purchasers, sizes and prices brought.

Plumbing and Heating.

Many of the beautiful new school houses erected in Sacramento the last year or two and which are illustrated in this issue of The Architect and Engineer, have plumbing and heating installations of the most approved types. In the high school building, which is to be illustrated in a future issue, all the plumbing and heating equipment is by Hatley & Hatley, whose main office is in the Miteau building, Sacramento. The same firm installed the plumbing and heating in the Newton Booth and Bret Harte schools, the plumbing in the former Franklin school and the heating in the McKinley grammar school.

In New Offices

Architect Aleck E. Curlett, Claud Beelman, associate, have moved their offices from the Merchants National Bank building, to 408 Union Bank building, Los Angeles, Mr. Curlett designed the Union Bank building, and has arranged a suite of five offices to suit his needs. He has plans on the boards at the present time for nine Class "A" buildings.

American National Bank Building, San Francisco
Metal Window-Frames and all sheet metal made of galvanized "Armco" Ingot Iron.
George W. Kelham, Architect
Forderer Cornice Works, Sheet Metal Contractor

ARMCO
TRADE MARK
INGOT IRON
Resists Rust

ARMCO

On the necessity for commercially pure iron in Office Buildings

Wherever the metal will be exposed to air and moisture, an iron free from rust-promoting impurities should be used.

All window-frames and sash should be made of rust-resisting iron, all skylights, cornices, guttering, down-spouting, water-tanks, heating and ventilating ducts, metal lath, and metal partitions.

These are apt to suffer from premature corrosion if made of iron or steel containing the usual amount of impurities, and most of the iron and steel manufactured in commercial quantities does contain them to a harmful extent.

The impurities form spots which promote rust. The only way to prevent the formation of spots is to reduce the quantity of impurities to a small percentage.

"Armco" Ingot Iron resists rust because it contains less than one-fifth of one per cent of such impurities, not enough to form the objectionable spots. Service and laboratory tests prove that it outlasts steel of the same guage and finish.

The American Rolling Mill Company, Middletown, Ohio

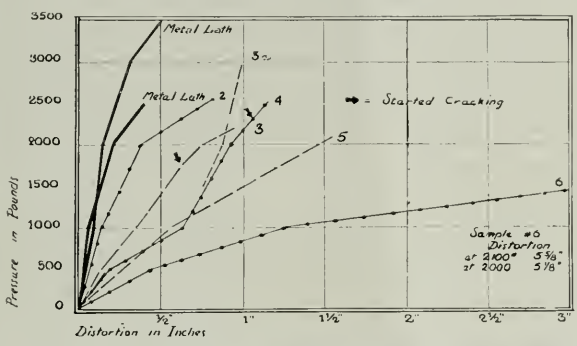
Builders Exchange New Officers

Mr. William H. George, manager of the Henry Cowell Lime and Cement Company has been elected president of the San Francisco Builders' Exchange, succeeding Mr. Charles W. Gompertz, whose term had expired.

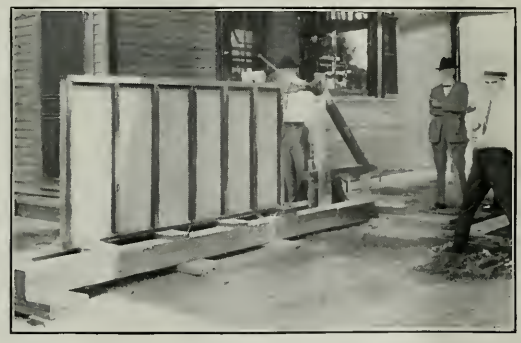
Other officers elected for the ensuing year are: Messrs. D. J. Sullivan, first vice president; Joseph B. Keenan, second vice president; George Bowen, third vice president; R. J. H. Forbes, secretary, and Alexander Mennie, treasurer.

Metal Lath *vs.* The Field

RECENT distortion tests conducted in Omaha to show the best possible type of exterior wall construction proves Back Plastered Metal Lath to be the best possible. You will note from the chart that at the greatest number of pounds pressure (3,500) back plastered Metal Lath showed a distortion of one-half inch. At this pressure it had not cracked nor did it show any signs of weakening. From the chart, the tests on other types of construction may be observed. Types No. 3 and No. 4 started to crack at points indicated. The chart proves the success of Metal Lath. As a result the building codes of a great many cities will undoubtedly be changed.



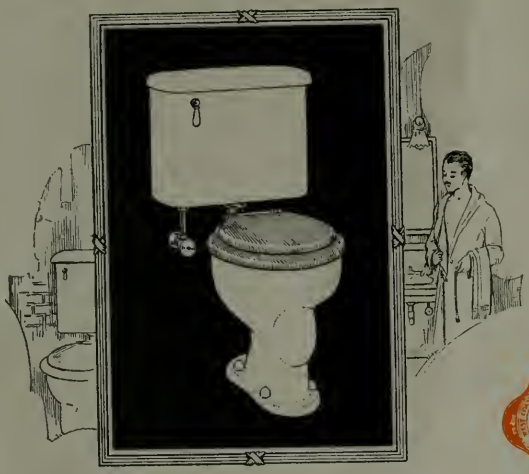
THE picture shows how the test was conducted. Heavy timbers were placed on the scale, which was connected with the lever shown leading to the jack. As the pressure of the jack was increased, the load was registered directly on the scale beam. Maximum pressure was forced against the wall of back plastered Metal Lath but it did not crack.



NOT only this test, but also a test conducted by Armour Institute, shows the superiority of Metal Lath over other forms of construction. The Armour test was to determine what form of wall construction made the best insulator. Again Metal Lath proved that "Metal Lath was against the field." Just as Metal Lath is becoming a means for better and more economical building construction, Herringbone Rigid Metal Lath is becoming THE Metal Lath in great demand today. It has proven its success to many architects and builders as well as being entirely satisfactory to the owner.

The General Fireproofing Co.

20 BEALE STREET SAN FRANCISCO, CALIF.



The "*Millbrae*" Closet has an extra large tank

With its extra large tank, massive bowl and simple lines, the "Millbrae" is especially attractive in appearance. Its stain-proof surface is easily kept clean and it retains its snow-white appearance permanently.

All "West Coast" Two-Fired Vitreous China Plumbing Fixtures are of the highest quality and cost no more than other standard high-grade fixtures.

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