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# **Technics and Architecture**

## **The Development of Materials and Systems for Building**

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The sources listed below include historical studies, definitive works on the subjects, and handbooks that clarify the knowledge at their time. Publishers are listed for all monographs of the twentieth century.

## Acoustics

- Forsyth, Michael. *Buildings for Music*. Cambridge: Cambridge University Press, 1985.
- Knudsen, Vern O. *Architectural Acoustics*. New York: John Wiley and Sons, 1932.
- Lyon, Gustave. *L'acoustique architecturale*. Paris: Editions Film et Technique, 1932.
- Russell, John Scott. "Elementary Considerations of Some Principles in the Construction of Buildings Designed to Accommodate Spectators and Auditors." *Edinburgh New Philosophical Journal* 27 (July 1839): 131–136.
- Sabine, Paul. *Acoustics and Architecture*. New York: McGraw-Hill Book Co., 1932.
- Sabine, Wallace C. "Architectural Acoustics." *American Architect and Building News* 68 (7, 21 April; 5, 12, 19 May; 9, 16 June 1900): 3–5, 19–22, 35–37, 43–45, 59–61, 75–76, 83–84.
- Smith, T[homas] Roger. *A Rudimentary Treatise on the Acoustics of Public Buildings*. London: 1861.
- Upham, J. B. *Acoustic Architecture, or the Construction of Buildings with Reference to Sound and the Best Musical Effect*. New Haven: 1853.
- Feldman, A. M. "Cooling Systems of Buildings." *ASHRAE Journal* 8 (March 1922): 377–392.
- Fiske, David L. "The Origins of Air Conditioning." *Refrigeration Engineering* 22 (March 1934): 122–126.
- Ingels, Margaret. *Willis Haviland Carrier, Father of Air Conditioning*. Garden City: Country Life Press, 1952.
- Jouglot, A. "On the Various Systems of Cooling the Air; and Their Application in Factories, Public Buildings, and Private Houses." *Practical Magazine* 1, no. 6 (1873): 450–463. Translated from *Moniteur Scientifique*.
- Ohmes, G. Richard, and Arthur K. Ohmes. "Early Comfort Cooling Plants." *Heating, Piping and Air Conditioning* 8 (June 1936): 310–311.
- Thévenot, Roger. *A History of Refrigeration throughout the World*. Paris: International Institute of Refrigeration, 1979.

## Cements

- Clauss, Adolf. "History of Mortars and Cements." *Stone* 4 (May 1892): 508–509.
- Davis, Arthur Charles. *A Hundred Years of Portland Cement, 1824–1924*. London: Concrete Publications Ltd., 1924.
- Francis, A. J. *The Cement Industry 1796–1914: A History*. London: David and Charles, 1977.
- Gooding, P., and P. E. Halstead. "The Early History of Cement in England." *Proceedings, Third International Symposium on the Chemistry of Cement, 1952*. London: Cement and Concrete Association, 1954.
- Halstead, P. E. "The Early History of Portland Cement." *Transactions of the Newcomen Society* 34 (1961–1962): 37–53.
- Lesley, Robert W. *History of the Portland Cement Industry in the United States*. Chicago: International Trade Press, Inc., 1924.
- Redgrave, Gilbert R., and Charles Spackman. *Calcareous Cements: Their Nature, Manufacture and Uses*. London: Charles Griffin and Co., 1905.

## Air Conditioning

- Anderson, Oscar Edward, Jr., *Refrigeration in America: A History of a New Technology and Its Impact*. Princeton: Princeton University Press (for University of Cincinnati), 1953.

Skempton, A. W. "Portland Cements 1843–1887." *Transactions of the Newcomen Society* 35 (1962–1963): 117–152.

### Elevators

- Baxter, William, Jr. *Hydraulic Elevators*. Chicago: Engineer Publishing Co., 1905.
- Brown, Thomas E. "Passenger Elevators." *American Architect and Building News* 86 (12, 19, 26 November; 10, 17 December 1904): 51–54, 67–71, 78–79, 83–86, 91–94.
- Bryan, John Albury. *Evolving the Elevator*. Because of Iron, no. 1. St. Louis: American Lithographing Co., 1947.
- Jallings, John H. *Elevators*. Chicago: American Technical Society, 1916.
- Kloman, Charles H. "The Growth and Development of the Elevator Industry." *Cassier's Magazine* 32 (September 1907): 389–404.
- Marryat, H. "Electric Passenger Lifts." *Journal of the Institution of Electrical Engineers* 62 (April 1924): 325–341, 342–349.

### Fire Protection

- Espie, J. J. *The Manner of Securing All Sorts of Buildings from Fire*. Trans. L. Dutens. London: 1756.
- Hamilton, S. B. *A Short History of the Structural Fire Protection of Buildings*. London: HMSO, 1958.
- Moore, Francis C. *How to Build 'Fire-proof'*. Publications of the British Fire Prevention Committee, no. 10. London: 1898.
- Sturgis, Russell, "An Unscientific Enquiry into Fireproof Building." *Architectural Record* 9 (January 1900): 229–253.
- Webster, John J. "Fire-proof Construction." *Minutes of the Proceedings, Institution of Civil Engineers* 105 (1890–1891): 249–288.
- Wight, Peter B. "Origin and History of Hollow Tile Fire-Proof Floor Construction." *Brickbuilder* 6 (March, April, May, July 1897): 53–55, 73–75, 98–99, 149–150.
- Wight, Peter B. "The Use of Burned

Clay Products in the Fireproofing of Buildings." *American Architect and Architecture* 90 (1, 8, 15 September 1906): 67–68, 75–78, 84–86.

### Glass

- Chance, Henry. "On the Manufacture of Crown and Sheet Glass." *Journal of the Society of Arts* 4 (15 February 1856): 222–231.
- Davis, Pearce. *The Development of the American Glass Industry*. Cambridge: Harvard University Press, 1949.
- Douglas, R. W., and Susan Frank. *A History of Glassmaking*. Henley-on-Thames: G. T. Foulis and Co., 1972.
- Hollister, Paul. "The Glazing of the Crystal Palace." *Journal of Glass Studies* 16 (1974): 95–110.
- Turner, W. E. S. "The Modern Production of Sheet Glass." *Journal of the Royal Society of Arts* 73 (24 July 1925): 821–837.
- Weeks, Joseph D. "Report on the Manufacture of Glass." In U.S. Census Office, *Report on Manufacturing in the U.S.*, vol. 2. 10th Census (1880).

### Heating and Ventilation

- Arnott, Neil. *On Warming and Ventilating*. London: 1838.
- Bernan, Walter. *On the History and Art of Warming and Ventilating Rooms and Buildings*. 2 vols. London: 1845.
- Billings, John S. *Ventilation and Heating*. New York: 1893.
- Billington, Neville S. "A Historical Review of the Art of Heating and Ventilating." *Architectural Science Review* 2 (November 1959): 118–130.
- Carpenter, Rolla C. *Heating and Ventilating Buildings*. New York: John Wiley and Sons, 1902.
- Dufton, A. F. "Early Application of Engineering to the Warming of Buildings." *Transactions of the Newcomen Society* 21 (1940–1941): 99–107.
- Planat, P. *Chauffage et ventilation des lieux habités*. Paris: 1880.
- Reid, David Boswell. *Illustrations of the*

*Theory and Practice of Ventilation*. London: 1844.

- Vetter, Hermann. "Heating from Roman Times to 1870." *Metal Worker, Plumber and Steam Fitter* 68 (28 September 1907): 58–60; (5 October 1907): 49–51. Translated from *Gesundheits-Ingenieur* 30 (31 August 1907): 10–25.
- Wright, Lawrence, *Home Fires Burning*. London: Routledge and Kegan Paul, 1964.

### Iron and Steel

- Ashcroft, J. W. "Notes on the Use of Iron and Steel in Building Construction." *Iron* (27 January, 10 February 1893): 74–75, 114–115. "The Development of Iron and Steel Roof Design." *Builder* 91 (22, 29 September 1906): 337–339, 363–365.
- Fleming, Robins. "Evolution of the Steel Skeleton Type of Building." *Proceedings, Engineers' Society of Western Pennsylvania* 43 (February 1927): 1–26.
- Gale, W. K. V. *Iron and Steel*. Industrial Archeology Series, no. 2. New York: Humanities Press, 1969.
- Hamilton, S. B. "The Use of Cast Iron in Building." *Transactions of the Newcomen Society* 21 (1940–1941): 139–155.
- Scott, W. Basil. "Constructional Steelwork: A Short History." *Architects' Journal* 68 (4, 11 July 1928): 19–23, 55–57.
- Temin, Peter. *Iron and Steel in Nineteenth-Century America: An Economic Inquiry*. Cambridge: MIT Press, 1964.
- Vierendeel, Arthur. *La construction architecturale en fonte, fer et acier*. Louvain: A. Uystpruyst, 1903.
- Walmisley, Arthur T. *Iron Roofs*. London: 1888.
- Woodworth, R. B. "Historic Notes on Metallic Beams and Girders." *Proceedings, Engineers' Society of Western Pennsylvania* (February 1912): 11–81.

## Lighting

- Alglave, Em., and J. Boulard. *The Electric Light: Its History, Production and Applications*. New York: 1884.
- Bell, Louis. "Elements of Illumination." *Electrical World and Engineer* 36 (10, 24 November, 8 December 1900): 727–728, 806–808, 882–884.
- Bright, Arthur A., Jr. *The Electric-Lamp Industry*. New York: Macmillan Co., 1949.
- Gerhard, William Paul. *Gas-Lighting and Gas-Fitting*. New York: 1894.
- Hammer, Edwin H. "Incandescent Lamp Development to the Year 1880." *Electrical World and Engineer* 36 (1, 8, 15 December 1900): 839–841, 880–882, 918–919.
- Liberty, W. J. "The Centenary of Gas Lighting and Its Historical Development." *Illuminating Engineer* 7 (April 1913): 175–231.
- Morgan, M. R. "The Early Development of Gas Lighting." *American Gas Journal* 95 (30 October, 6 November 1911): 278–283, 289–295, 298–301.
- Scott, Roscoe. "The Evolution of the Lamp." *Transactions of the Illuminating Engineering Society* 9 (February 1914): 138–163.
- Williams, W. Mattieu. "A Contribution to the History of Electric Lighting." *Journal of Science* 16 (February 1879): 155–162.

## Lightning Protection

- Hedges, Killingworth. *Modern Lightning Conductors: An Illustrated Supplement to the Report of the Lightning Research Committee of 1905*. London: Crosby Lockwood and Sons, 1905.
- Lodge, Oliver J. *Lightning Conductors and Lightning Guards: A Treatise on the Protection of Buildings*. London: 1892.
- Symonds, G. J., ed. *Lightning Rod Conference: Report of the Delegates*. London: 1882.

## Masonry

- Bowles, Oliver. *The Stone Industries*. 2d ed. New York: McGraw-Hill Book Company, 1939.

- Chamberlain, Humphrey. "The Manufacture of Bricks by Machinery." *Journal of the Royal Society of Arts* 4 (6 June 1856): 491–501.
- Green, A. T., and Gerald H. Stewart, eds. *Ceramics: A Symposium*. Stoke-on-Trent: British Ceramic Society, 1953.
- Hamilton, S. B. "The History of Hollow Brick." *Transactions, British Ceramic Society* 58 (February 1959): 41–61.
- "History of the Manufacture of Hollow Bricks." *Building News* 4 (26 March 1858): 317–318.
- Hudson, Kenneth. *The Fashionable Stone*. Park Ridge, N.J.: Noyes Press, 1972.
- Mars, G. C. "Brick—Its Manufacture." *American Architect—Architectural Review* 123 (11 April 1923): 313–318, 383–387.
- Merrill, George P. *Stones for Building and Decorating*. 3d ed. New York: John Wiley and Sons, 1903.
- Ries, Heinrich, and Henry Leighton. *History of the Clay-Working Industry in the United States*. New York: John Wiley and Sons, 1909.
- Shaw, W. "British Quarry Practice." *Rock Products* 25 (18 November 1922): 23–24.

## Reinforced Concrete

- Colby, Albert Ladd. *Reinforced Concrete in Europe*. Easton, Pa.: Chemical Publishing Co., 1909.
- de Tedesco, N. "The Historical Evolution of Reinforced Concrete in France." *Concrete and Constructional Engineering* 1 (July 1906): 159–170.
- Draffin, Jasper O. "A Brief History of Lime, Cement, Concrete and Reinforced Concrete." *Journal of the Western Society of Engineers* 48 (March 1943): 14–47.
- Fling, Russell S. *Early Developments in American Concrete*. Preprint 2791. New York: American Society of Civil Engineers, 1976.
- Hamilton, S. B. *A Note on the History of Reinforced Concrete in Buildings*. National Building Studies. Special Report no. 24. London: HMSO, 1956.

- Hatt, W. K. "Genesis of Reinforced Concrete Construction." *American Concrete Institute, Proceedings of the 12th Convention* 12 (1916): 21–39.
- Kohlmorgen, O. "The Historical Evolution of Reinforced Concrete in Germany." *Concrete and Constructional Engineering* 1 (November 1906): 325–329.
- Planat, Paul. "Expériences sur les ciments armés." *Construction Moderne* 14 (25 March, 29 April, 27 May, 3 June, 22 July, 5, 12 August 1899): 309–311, 368–371, 416–418, 429–431, 514–515, 538–540, 548–549.
- Potter, Thomas. *Concrete: Its Use in Building*. 2 vols. Winchester: 1891–1894.
- Ransome, Ernest L., and Alexis Saurbrey. *Reinforced Concrete Buildings*. New York: McGraw-Hill, 1912.
- Titford, R. M., ed. *The Golden Age of Concrete*. London: Dorothy Henry Publications, 1964.

## Sanitation

- Brown, Glen. *Water-Closets. A Historical, Mechanical and Sanitary Treatise*. New York: 1884.
- Clark, Theodore Minot. "Modern Plumbing." *American Architect and Building News* 3–4 (23, 30 March, 27 April, 25 May, 13 July, 3, 31 August, 14 September, 26 October, 30 November 1878): 101–102, 109–110, 144–145, 180; 11–13, 38–40, 73–75, 90–92, 140–141, 178–180.
- Gerhard, William Paul. *The Water Supply, Sewerage, and Plumbing of Modern City Buildings*. New York: John Wiley and Sons, 1910.
- Lamb, H. A. J. "Sanitation: An Historical Survey." *Architects' Journal* 85 (4 March 1937): 385–403.
- Palmer, Roy. *The Water Closet: A New History*. Newton Abbot: David and Charles, 1973.
- Wright, Lawrence. *Clean and Decent*. New York: Viking Press, 1960.

## Structural Engineering

- Charlton, T. M. *A History of Theory of Structures in the Nineteenth Century*. Cambridge: Cambridge University

- Press, 1982.
- Hamilton, Stanley Baines. "The Historical Development of Structural Theory." *Proceedings, Institution of Civil Engineers, Part 3: Engineering Division 1* (1952): 374–419.
- Peck, Ralph B. *History of Building Foundations in Chicago*. University of Illinois, Engineering Experiment Station, Bulletin Series, no. 373. Urbana-Champaign: University of Illinois, 1948.
- Randall, Frank A., Jr. "Historical Notes on Structural Safety." *Proceedings of the Annual Convention, American Concrete Institute* 70 (1973): 669–679.
- Sooysmith, Charles. "Foundation Construction for Tall Buildings." *Engineering Magazine* 13 (April 1897) 20–33.
- Straub, Hans. *A History of Civil Engineering*. Trans. Erwin Rockwell. Cambridge: MIT Press, 1964.
- Westergaard, H. M. "One Hundred Fifty Years Advance in Structural Analysis." *Transactions, American Society of Civil Engineers* 94 (1930): 226–246.
- Latham, Bryan. *Timber: Its Development and Distribution: A Historical Survey*. London: George G. Harrap, 1957.
- One Hundred Years of Engineering Progress with Wood. Proceedings of Wood Symposium. Washington: Timber Engineering Company, circa 1952.
- The Saw in History*. Philadelphia: Henry Disston and Sons, 1915.
- Wood, Andrew Dick, and Thomas Gray Linn. *Plywoods: Their Development, Manufacture and Application*. Brooklyn: Chemical Publishing Company, Inc., 1943.

### **Terra-Cotta**

- Geer, Walter. *The Story of Terra Cotta*. New York: Tobias A. Wright, 1920.
- King, Harry Lee. "A History of Architectural Terra-Cotta." *Architecture and Building* 45 (July 1913): 208–211, 311–316.
- "The Manufacture of Terra-Cotta in Chicago." *American Architect and Building News* 1 (30 December 1876): 420–421.
- Taylor, James. "The History of Terra Cotta in New York." *Architectural Record* 2 (December 1892): 137–148.

### **Wood**

- Hindle, Brooke, ed. *America's Wooden Age: Aspects of Technology*. Tarrytown, N.Y.: Sleepy Hollow Restoration, 1975.
- Larson, Agnes M. *History of the White Pine Industry in Minnesota*. Minneapolis: University of Minnesota Press, 1949.