A Technological History

American Building. Materials and Techniques from the First Colonial Settlements to the Present. CARL W. CONDIT. University of Chicago Press, Chicago, 1968. xiv + 329 pp., illus. $10.

One evidence of the fundamentally pragmatic and parochial status of American civil and structural engineering has been the complete absence of any historical or conceptual examination of its field of jurisdiction. A consequence of this outlook has been to give its literature a narrow, antitheoretical (not to say anti-intellectual) bias. Even more importantly, perhaps, it has contributed to its unbalanced development—the extravagant cultivation of certain types of structure while others, equally promising, have been neglected. Thus a broad historical account of the technology of structural engineering, such as Condit has undertaken here, might well be regarded as the first step in correcting these errors. Actually, Condit has already published two books covering much of the same ground—the monumental, two-volume *American Building Art* (1960) and *The Chicago School of Architecture* (1964). But this new work, at once broader in scope and simpler in construction, and part of the Chicago History of American Civilization series edited by Daniel J. Boorstin, may well have a wider audience and greater cultural impact.

Condit's book presents a straightforward chronological account of the development of American structural systems from the earliest days. His very insistence upon treating *all* types of fixed structures alongside the more conventional architectural ones is a measure of the novelty of his approach and the quality which gives the book its unusual interest. For although conventional architectural histories overlook the fact, theoretical and technological developments at any point inevitably irradiated the entire field (for example, the expansion of the metallurgical industry during the Civil War was the precondition for the rise of the skyscraper in the 1880's). Condit's account unfolds almost entirely in the form of case histories, organized in a sort of evolutionary sequence to enable the reader to follow a given development from first experiment to maturation. He divides this account into four sections: 1600–1789, 1789–1865, 1865–1900, and 1900–1968. (Actually, each of these epochs is bounded by a great war, each of which had profound effects upon American engineering; it might have been even more precise to organize the last half thus: 1865–1917, 1917–1945, 1945–1968.) His handling of the first phase is adequate but cursory, perhaps because of the primitiveness of the technology involved. The second section, The Agricultural Republic, incorporates little-known and hence intriguing new materials; but his handling of the post-Civil War period is, for this reader at least, the most rewarding, because it covers the seminal phase of American architecture. The final section, which brings the account down to today, is as comprehensive a coverage as can be found anywhere.

One of Condit's strengths as a historian is that, while he is formally trained as an engineer, he also holds a doctorate in English literature and is now a professor of art. This exotic combination gives him a vantage point at once informed and eccentric. As a result, he examines structures not normally considered by *anyone* working in this field —for example, the Philadelphia Waterworks of 1837, the Mormon Tabernacle in Salt Lake City of 1868. He discovers and exposes the hidden structural realities of well-known monuments, such as the complex skeleton inside the Washington Monument or the reinforced concrete skeleton of the old Ponce de Leon Hotel in St. Augustine. A vast amount of detailed information not available between the covers of any other single book is here displayed.

A careful reader can of course point to some errors of commission and omis-

Bridge built by the Union Pacific Railroad over the Missouri River between Omaha, Nebraska, and Council Bluffs, Iowa, 1868–1872. This was the largest bridge in which use was made of a truss invented by S. S. Post in 1865. "Post thought that [the inward slope of the trusses in opposite directions on either side of the central panel] offered greater rigidity, but there is no ground for supposing that this would be the case." This bridge "was as noteworthy for its short life as for its great size and unusual construction. Each pier . . . was made up of a pair of cast-iron drums filled with concrete, a crude but useful innovation that constituted an early step in the development of the concrete bent. On the other hand [the bridge had] no horizontal bracing in the top, bottom, and portal frames, so that the two trusses of any one span were virtually independent structures. This oversight made the bridge radically vulnerable to wind, which soon demonstrated the fact: most of the river spans were destroyed by a tornado in 1877." [From *American Building*]

sion in Condit's text. The log-framing systems employed by early Scandinavian and Moravian settlers in this country are more fundamentally distinct than he seems to think; and this difference extends, morphologically, back into the prehistory of their respective homelands. And one can list important structures he does not include. He does not treat the extraordinary timber-framed roofs and belfries of two great churches in Providence—the First Baptist Meeting House (1775) and the First Congregational (1814). Overlooked also are the extremely interesting metal roof-framing systems employed by Ammi B. Young while he was supervising architect for the U.S. government in the 1850's, and the whole field of tented and pneumatic structures whose potentials the young German engineer Frei Otto has so brilliantly demonstrated.

But these are small flaws. For purposes of clarity, Condit has wisely not tried to list every project of a given category merely to show that he is aware of its existence—an all-too-common practice among art and architectural historians. Instead, every project mentioned is treated in some detail, and some 112 are illustrated. For reasons of clarity also (one assumes), he has omitted all documentation; there are only two footnotes in the book—and these document two direct quotations of no great significance. This technique undoubtedly makes more easily digestible his fact-packed text. But it also throws us completely upon the author's mercy. He is an established scholar, and his book bears the internal evidence of broad and careful research. Nevertheless, we are many times compelled to accept his word that this or that project marks the "first time" that such and such a theory was employed or new technique applied.

From a literary standpoint, Condit's approach to his material gives the book a monochromatic texture which makes sustained reading difficult. There is a mass of important data about many buildings, but this verbal information is isolated from the relevant illustrations, which are grouped in inserts but might better have been distributed through the text. The problem of literary style has its conceptual side as well. Admittedly, Condit deals with a complicated subject whose complexity increases geometrically with time. But there are surely more attractive methods of handling his materials than the one he employs. These materials fall into four categories: building type (church, house), structural form (truss, cantilever), structural material (steel, wood), and fabrication method (bolting, welding). Each of these categories has had its own phylogenetic development, and Condit's account would have been both clearer and more interesting had he followed them—for example, *trusses* from early wooden types to contemporary variants like the space frame and "bicycle" truss, or timber *fabrication methods* from mortise-and-tenon, through nails and bolts, down to modern glued-up laminates. Instead, he zigzags back and forth across the field, writing sometimes about steel bridges, sometimes about steel trusses, sometimes about steel skyscrapers. The shifting of these vantage points tends to obscure somewhat the dramatic evolution of his subject.

The illustrations in the book are excellent, many of them rare pictures of little-known structures. There is a very judicious list of suggested readings. The index is inadequate for such complicated material.

American Building marks a watershed for its field. It is certain to have a salutary effect on civil and structural engineers, all of whom should study it as professionals or students. It constitutes an important document to be read in tandem with histories of American architecture, including one, with an identical title, by this reviewer.

JAMES MARSTON FITCH
School of Architecture,
Columbia University,
New York, New York

Frauds and Follies

The Medical Messiahs. A Social History of Health Quackery in Twentieth-Century America. JAMES HARVEY YOUNG. Princeton University Press, Princeton, N.J., 1967. xiv + 460 pp. $9.

In his journal for 1686, John Locke, physician and philosopher, put down some of the virtues of a specific known as the Wound Wood. "If any young or old troubled with the dysentery gripings of the bowels or fits of the smother, let them with this wood stroak the parts downward and it will ease the pain." Or again, "For a woman in travail if she be placed on a chair made of this wood she will bring forth easier and speedier." In all, Locke noted 26 medical uses of the Wound Wood for both men and animals. Today, from the vantage point of almost three centuries of accumulated medical and scientific knowledge, we smile knowingly at the miraculous claims made for such a pharmacopeia. Was this once the state of medical knowledge? Our poor ancestors—no wonder quacks abounded in Locke's England. Before our smiles freeze, and before we pride ourselves on current scientific enlightenment, let it be said that in 1966, with a scientific revolution under way in medicine and biology, a heightening of standards of medical education and care, a highly sophisticated pharmaceutical industry, and a government keenly aware of the necessity of regulating the manufacture and dispensation of medical products, Americans spent more than $2 billion for quack medicines and cures. It is this paradox of rationalism and antirationalism in medical treatment that James Harvey Young addresses himself to in *The Medical Messiahs,* the second volume of his inquiry into the history of medical quackery in the United States.

When Hector St. John de Crèvecoeur in his *Letters from an American Farmer* (1782) asked the question, "What is then this new man, an American?," he was not dealing with a new man, but rather with an ordinary man who held tenaciously to Old World beliefs, not the least of which was an abiding faith in a large number of nostrums and quack cures for coping with disease and promoting health. Early Americans, like their English forebears, dosed themselves with the like of Daffy's Elixir, Dr. Bateman's Pectoral Drops, and Turlington's Balsam of Life. If these specifics were discarded by the beginning of the 19th century, it was not because Americans had acquired new convictions and wisdom about the use of nostrums, but rather because they switched to such homegrown medicines and cures as Dr. Lee's Bilious Pills, Elisha Perkin's Electric Rods, Samuel Thomson's botanic cures, Henry Hembold's Bachu, and William Radam's all-purpose Microbe Killer. Dr. Oliver Wendell Holmes of Boston characterized the patent-medicine makers who made fortunes at the expense of their neighbors' ills and infirmities as Toadstool Millionaires (a phrase that provided the title for Young's earlier book). In spite of such moral indignation, however, national belief in patent-medicine nostrums remained intact throughout the 19th century. It wasn't until 1906 that Congress passed a Pure Food and Drug Act that was in part designed to control some of the grosser manifestations of medical quackery.