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Résumé de l'article

À la fin du XIX^{e} siècle, la construction de quartiers réservés aux entrepôts devient un élément important de la croissance des villes en Amérique du Nord. Ce type de quartier constitue le centre d'activité des grossistes, principaux agents de l'expansion du commerce. Souvent, les entrepôts mêmes sont remarquables du point de vue architectural. De fait, l'entrepôt reste d'ordinaire, avec la gare de chemin de fer, le véritable monument de la ville nord-américaine. Le présent article examine la façon dont s'est formé le quartier du commerce de gros.

Warehouses and Warehouse Districts in Mid-American Cities*

Leonard K. Eaton

Résumé/Abstract

À la fin du XIX^e siècle, la construction de quartiers réservés aux entrepôts devient un élément important de la croissance des villes en Amérique du Nord. Ce type de quartier constitue le centre d'activité des grossistes, principaux agents de l'expansion du commerce. Souvent, les entrepôts mêmes sont remarquables du point de vue architectural. De fait, l'entrepôt reste d'ordinaire, avec la gare de chemin de fer, le véritable monument de la ville nord-américaine. Le présent article examine la façon dont s'est formé le quartier du commerce de gros.

In the late nineteenth century, the construction of warehouse districts became an important part of the building process in the North American city. These warehouse districts were the centres of activity for the wholesalers who were the key agents for the expansion of mercantile capitalism. The warehouses themselves were often structures of unusual architectural distinction. With the railroad station, the warehouse was ordinarily the true civic monument of the North American city. This article studies the process by which the wholesale district was formed.

In the second half of the nineteenth century, warehouse districts emerged as important components of mid-American cities, and the warehouse became a significant building type. The major cause for this development was the presence of wholesaling on a grand scale, which requires the construction of buildings to serve as containers of goods being forwarded to the users. In the Midwest the latter were country storekeepers and ultimately, of course, the farmers who were settling the country. The wholesaler was the key to the pattern of trade in the nineteenth century. The important cities of the interior grew up at points he selected. He was the real pioneer of mercantile capitalism, and characteristically he located his business on a major waterway which drained a rich agricultural district. At this location a wholesaling centre appeared. Initially a stopping place for riverboats, it subsequently became an important railway centre. It was the railway which called large-scale wholesaling into being, and the connection between yard, spur and warehouse was intimate. The warehouse district was a nucleus for a vital portion of the urban fabric.

The first settler of the midwestern city was usually a Frenchman or Spaniard who came up the river (the Mississippi or the Missouri) and picked the site as a likely spot for carrying on the Indian trade. Initially the population remained small, but in the 1840s the first substantial contingent of Anglo-Saxon settlers arrived. About 1850 two important events took place when the town was incorporated and platted. By this time a number of perceptive businessmen were on hand, the ancestors of those who in later years would be known as "the old families". For the platting, a simple gridiron system was used. This was in accordance with common American practice and later proved a great boon for real estate speculators. By the outbreak of the American Civil War a thriving town of about ten thousand people was in place; it had a few local industries such as sawmills and brickyards, but there was nothing particularly distinguished about its planning or architecture. Real achievement in these fields awaited the coming of the railway. Nonetheless its leading men were convinced that their town had a great future and that its strategic location would insure its prosperity. It was the gateway to a phenomenally rich agricultural area, and the farmers who settled in that region could not escape dependence on them for supplies. The patterns of distribution that had evolved by 1900 are shown on Figure 1.[1]

An analysis of the role of the wholesaler in the economy of nineteenth-century North America is necessary for an understanding of the kind of building he put up. Basically this man supervised the distribution of trade. In an age when overland transportation was confined to the railway and the horse-drawn vehicle, he performed a vital function for the farmer and the small-town retailer. His expertise lay in his knowledge of who produced the commodities they required, and of the means of bringing buyer and seller together. He was thoroughly conversant with freight rates, forwarding agents and storage facilities. Thus his services were essential to an economy that was agrarian throughout most of the nineteenth century. Because of this dependence on the transportation network

* *Editor's Note*: A companion piece to this article, entitled "Winnipeg: The Northern Anchor of the Wholesale Trade," will be published in a subsequent issue of the *Urban History Review*.

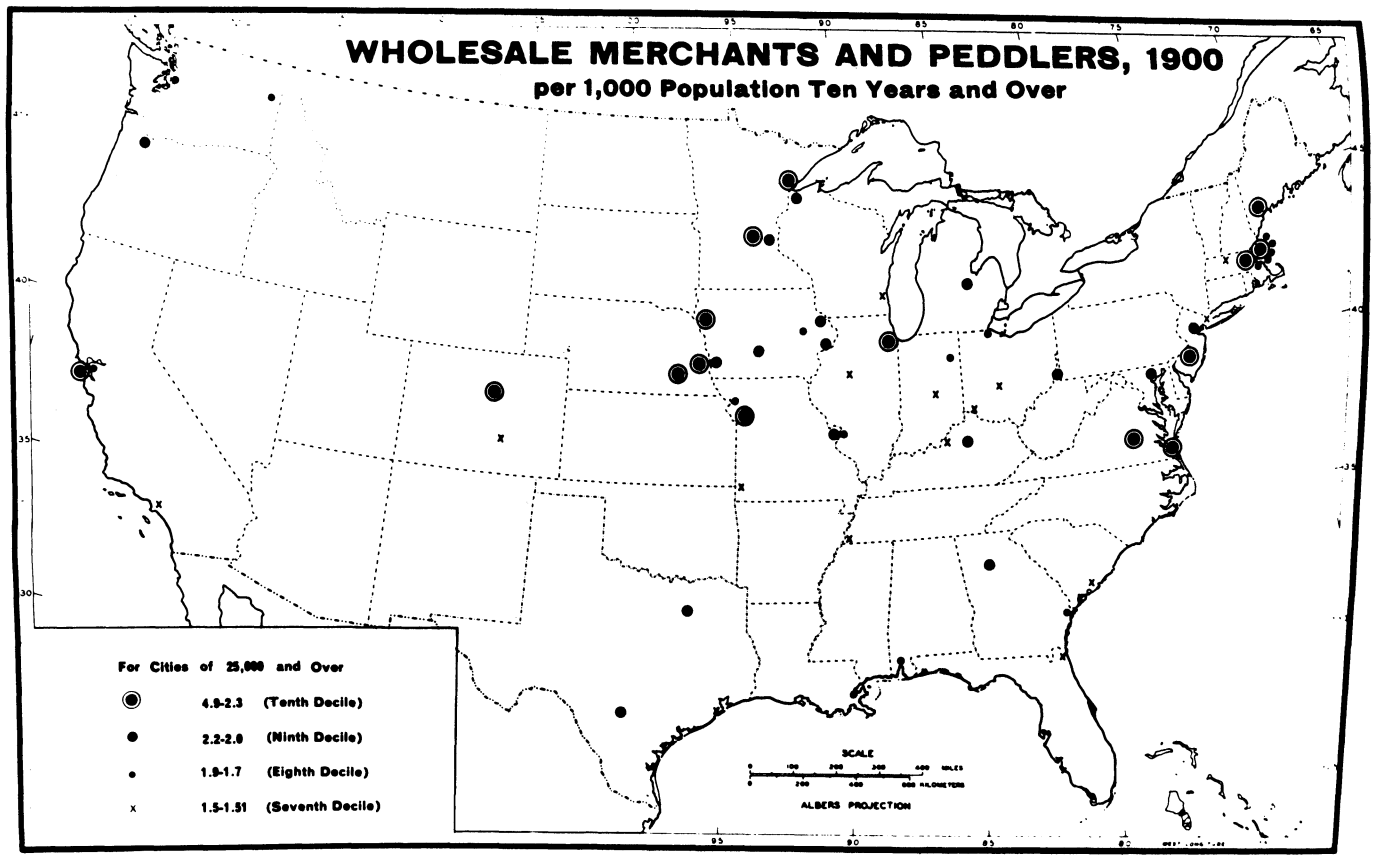


FIGURE 1. American Wholesale Merchants and Peddlers, 1900

SOURCE. Courtesy of James Vance

the wholesalers located their first warehouses near the steamboat landing. When the railways arrived, they tended to follow the easy grades of the river floodplain, and to place their passenger and freight terminals close to the old steamboat docks, As the railways displaced the steamboats, the jobbers found that goods could be dispatched by carload lots, normally sent by a manufacturer to a wholesaler but sometimes to large retailers as well. This expansion in the size of the shipment was responsible in large measure for the leap in scale which is characteristic of the American warehouse in the 1880s, the period in which it suddenly became a major civic monument. Its golden age lasted until about 1910, and during this interval it was usually the best-designed public building in the city. The shipments could be moved over sidings built directly to the loading doors of the warehouses. Thus the railway was tied into the warehouse district, and if one examines the area today, it will be found to be still intimately connected with the transportation network.

The district also generated a large amount of economic activity other than wholesaling. The jobber of wholesale dry goods, for example, found it easy to move into the manufacturing of overalls, a tempting proposition because the farmer had an almost unlimited need for these garments. The same held for work shoes. The jobber himself required banking services, and ordinarily one or two banks in the city would cater to his special requirements. They would be located conveniently on the perimeter of the district. His employees required restaurants and bars; the latter were especially important because they were willing to cash pay cheques at hours when the banks were closed. The distribution system could not have worked without hundreds and thousands of travelling salesmen who fanned out from the city into the territories the wholesaler served. When these men arrived in town, they needed a place to stay. Hence came the development of a hotel district and of specialized "Travellers Clubs". In short, the wholesale district generated a large range of activities which contributed to the generally sustained population growth of the city.

The Warehouse: Definition and Programme

In 1904, architectural critic Russell Sturgis neatly characterized the problems and programme of the warehouse and industrial building:

> Without splitting hairs too minutely, we come to the conclusion that anything is either a warehouse

> or a factory which is devoted to the rougher kind of business enterprise; that is to say, not primarily to offices where professional men sit quietly or clerks pursue their daily tasks, but one where the goods are piled up, where the unloading and loading, the receiving and the shipping of such goods goes on continually, where the floors are to a great extent left open in great "lofts" and where in consequence the character of the structure within and without is the reverse of elegant.[2]

Sturgis went on to argue that the warehouse or factory might be costly and solidly built. It might be an architectural monument, but it could not be minutely planned with many refinements in interior arrangement. Elaborate exterior decorative treatment was inappropriate, as were extraordinary combinations of masses. The exterior walls would present the appearance of a square-edged, flat-topped box, and the masses would nowhere break into porches or turrets. Delicate stonework was out of the question, nor was sculpture a part of the programme. Colour, if used, was apt to be applied rather freely.

To this analysis may be added certain considerations which Sturgis omitted. The warehouse or factory had to have a certain amount of office space at the front of the building where managers could carry out their duties, customers could be received and secretaries and bookkeepers could work. A particularly important section was the sample room where the various products offered by the firm could be shown. Wholesaling was a competitive business, and an attractive display area was a necessity. Oscar Eckerman's warehouses for the John Deere Plow Company of 1902-03 in St. Louis are a good example of a combination of facilities (Figures 2, 3, 4). It will readily be seen that the clerical functions are accommodated on the second floor, since farm machinery had to be loaded on to railway cars at grade level. The side and rear elevations of the structure had to have several large openings through which goods could easily be moved to the adjacent railway spurs. Within the building itself objects were moved vertically on freight elevators and across the floors on dollies. The presence of the railway spurs meant that the side and rear elevations were usually visible, and they received a more intensive architectural treatment than many of the office buildings of the day, which were only too often façade architecture unless they happened to occupy corner sites. The elevations did not, however, have to be opened up with continuous fenestration, as in the skyscraper, where light and ventilation were primary requirements. In a peculiar sense the problem of the warehouse was almost the obverse of that of the office building. Prolonged exposure to light could cause deterioration in certain kinds of goods, particularly fabrics and drugs. Side elevations with rows of small windows were therefore common.

Symbolism was also a part of the programme, and here it is appropriate to observe that a large number of the great

FIGURE 2. **John Deere Plow Company Warehouses, St. Louis, Missouri.** Architect – Eckerman. October 16, 1903

SOURCE. John Deere and Company

western warehousing concerns were family operations. Honour and social position required that the exterior of the building convey a message of stability and enduring strength, which was very much in keeping with the heavy structural system employed. The buildings had to signify the owners' status in the community and the financial soundness of the firms. Often they appeared in the advertisements and trade circulars of the wholesalers; they were important symbols. The same interpretation could be extended to the branch selling houses of those companies that were essentially family concerns, notably the John Deere Plow Company and Butler Brothers. The branch warehouse of Deere in Omaha, for example, may be considered as much a symbol of the solid worth of the company and the high quality of its products as the much better known corporate headquarters by Eero Saarinen in Moline, Illinois. This symbolic aspect of American business architecture is often overlooked.

The public image projected by the warehouse, then, had to suit the character of the successful wholesaler. About this man too little is known. Obviously he was a man of ability and ambition, and he was able to see the advantages of prime location in carrying on his business. Except in rare cases the records do not reveal much formal education and certainly no training in architectural discrimination. Personal records – diaries, correspondence with architects, etc. – are equally scarce; the nineteenth-century wholesaler was primarily a man of action, and, although he may have paid considerable attention to the buildings he was putting up, he did not discuss them with his family and friends in any extended fahion. Nonetheless, one cannot escape the impression that he was inter-

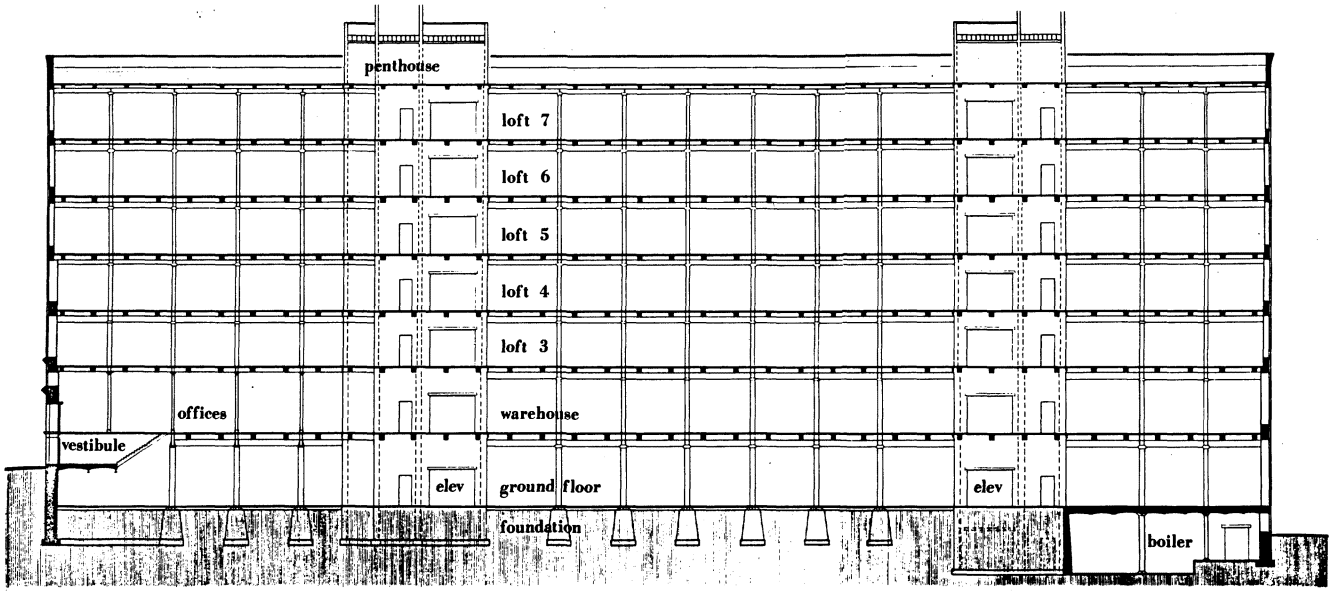


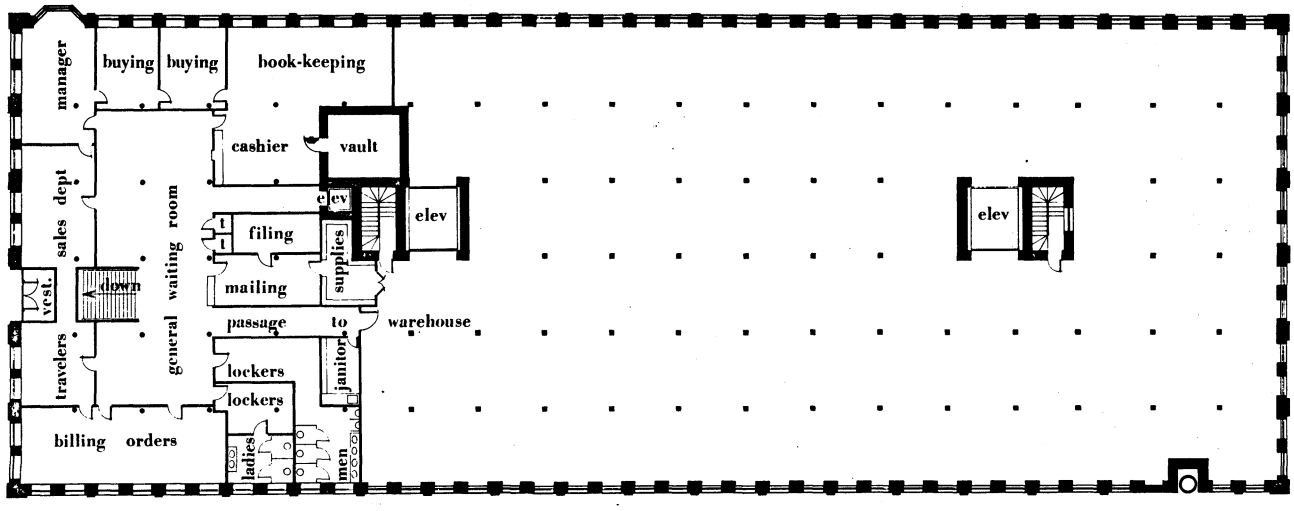
FIGURE 3. Longitudinal Section of St. Louis Warehouse, 1905

SOURCE. Drawing by Robert Daverman; courtesy of John Deere and Company

ested in the subject of building. There was probably plenty of talk about the new warehouses within the premises of the Minnesota Club in St. Paul, the Minneapolis Club in Minneapolis or indeed the Manitoba Club in Winnipeg, a city that shares many of the characteristics of the American midwestern city. Obviously the wholesaler was a public figure, and he knew that what he did would have an impact on the physical face of the community. Frequently new wholesale houses were noticed in trade journals such as the *Commercial* in Winnipeg, and *Farm Implements* in Minneapolis. Less frequently they were mentioned in the daily newspapers. The exception here is Winnipeg. So fascinated were its citizens with the rapid growth of the town that the *Manitoba Free Press* and the

FIGURE 4. Plan of St. Louis Warehouse, 1905

SOURCE. Drawing by Robert Daverman; courtesy of John Deere and Company



Winnipeg Tribune for several years published annual building numbers. These were reviews of progress in construction, and they are a mine of information on trade and building technology.

The Warehouse: Problems of Structure

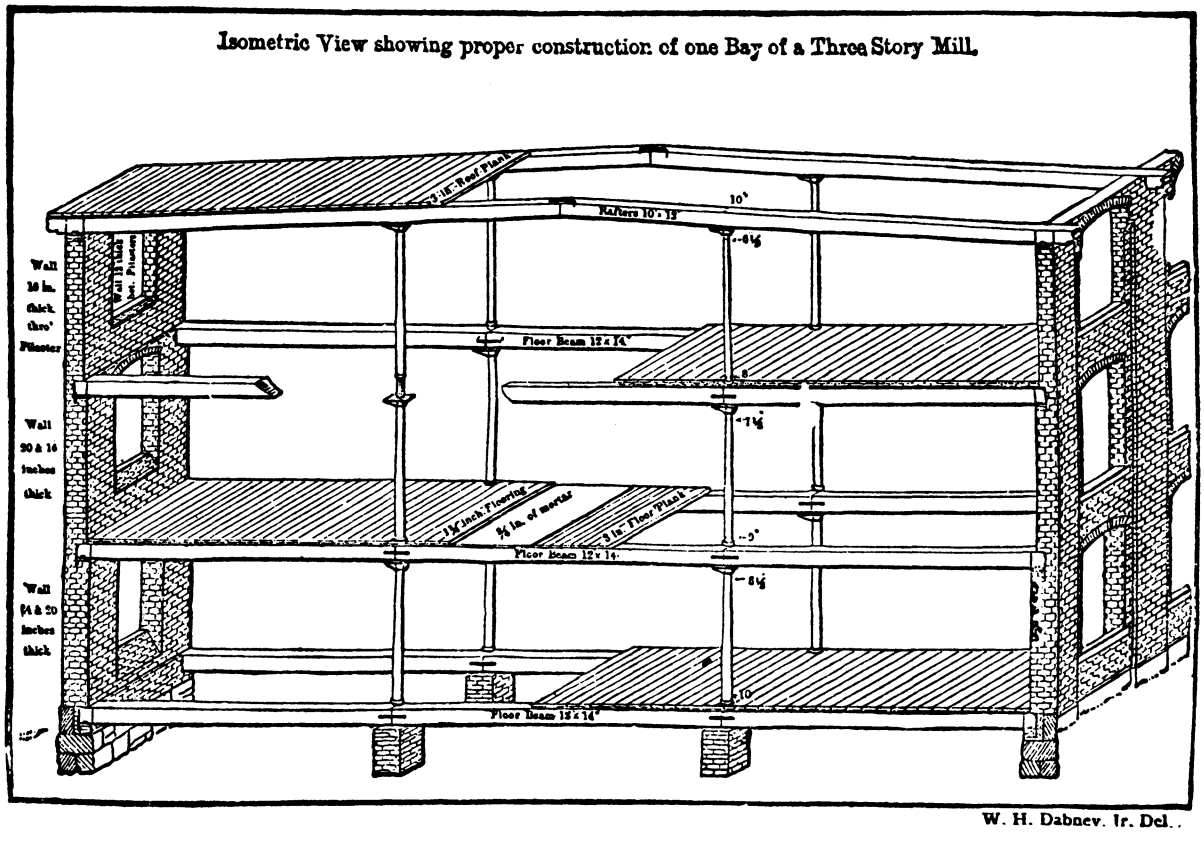
For centuries the greatest hazard of the wholesaler's business had been fire. With the dramatic growth of trade in the nineteenth century it became an urgent concern, and numerous architects and engineers devoted their best efforts to its solution. The outstanding European contribution was undoubtedly that of Jesse Hartley, the famous Liverpool builder. He was in fact so successful that his work was carefully studied by a committee from the American Congress. During the summer of 1846, two of its members investigated the warehousing systems of the major European ports. They were particularly enthusiastic about the work of Hartley, and their report included some of his signed drawings of the Albert Dock in Liverpool. What especially impressed the congressmen were his planning, construction and fireproofing techniques, and they recommended similar buildings for the major ports of the United States. Although it is impossible to evaluate how widely a congressional document circulates, there is no doubt that the Liverpool warehouses were known to the mercantile community which actually used them. American architects probably failed to emulate them, not because they were unfamiliar, but because they were expensive. Hartley used a system of masonry arches and load-bearing partitions whose cost was prohibitive in the United States.[3]

To meet the requirement of fireproof construction, architects turned to a system of mill construction which evolved prior to the Civil War at the behest of the textile manufacturers of New England.[4] Spinning and weaving are, of course, occupations in which there is a substantial hazard of fire because the raw materials are naturally oily and machines require lubrication. The solution for the early New Englanders was a deliberate over design in timber so that wooden structural members would char rather than burn. This system was in use as early as 1827 and was common knowledge to mill builders of the following generation, during which textile manufacture was at its height. It would certainly have been known, for example, to E.P. Bassford (born 1837), who received his training in Boston and migrated to St. Paul in the post-Civil War period. A good description of it is in Frank Kidder's *Architect's and Builder's Pocket-book* (1885). The method was published earlier by the insurance companies, but the drawings which Kidder used to accompany his text are strikingly clear. He wrote:

> The desideratum in this mode of construction is to have a building whose outside walls shall be built

FIGURE 5. Sample Bay and Capital Detail

SOURCE. Frank E. Kidder. *The Architect's and Builder's Pocket-book* (New York, 1885).



of masonry (generally of brick) concentrated in piers and buttresses with only a thin wall containing the windows between and the floors and roof of which shall be constructed of large timber, covered with a plank of suitable thickness; the girders being supported between the walls by wooden posts.[5]

Kidder went on to stipulate that there be no furring or concealed spaces, that beams be solid or double and bolted together, that the posts have half-inch holes near the top for ventilation, that no polish or varnish be used, and that floor planking be not less than three inches thick. The best construction was laid over three inches of mortar. Columns were usually round, and should be a minimum of nine inches in the first storey, eight inches in the second and seven inches in the third; he suggested using well-seasoned hard pine or oak for them. The system and a typical structural detail are shown in Figures 5 and 6. It was, he said, the most approved construction for factories, mills and storehouses, and these dimensions were adequate for bays in which the columns were not more than eight feet on centre. Where bays were larger or floor loads greater, plans and timbers should be proportioned accordingly. When the automatic sprinker (invented 1879) was added, the system was remarkably fire-resistant. Cast iron, unhappily, deflects under heat, and by using heavy timber, this disadvantage was avoided.

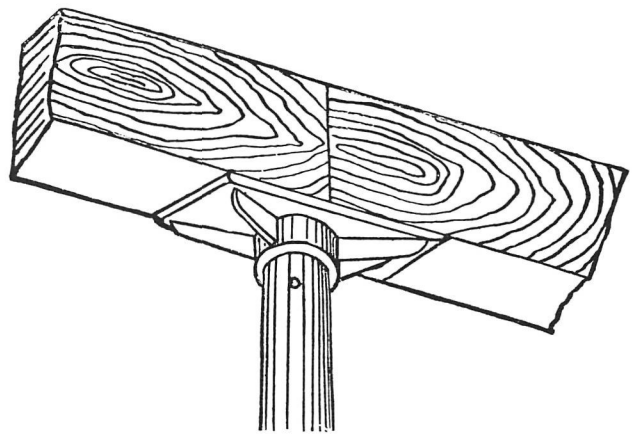


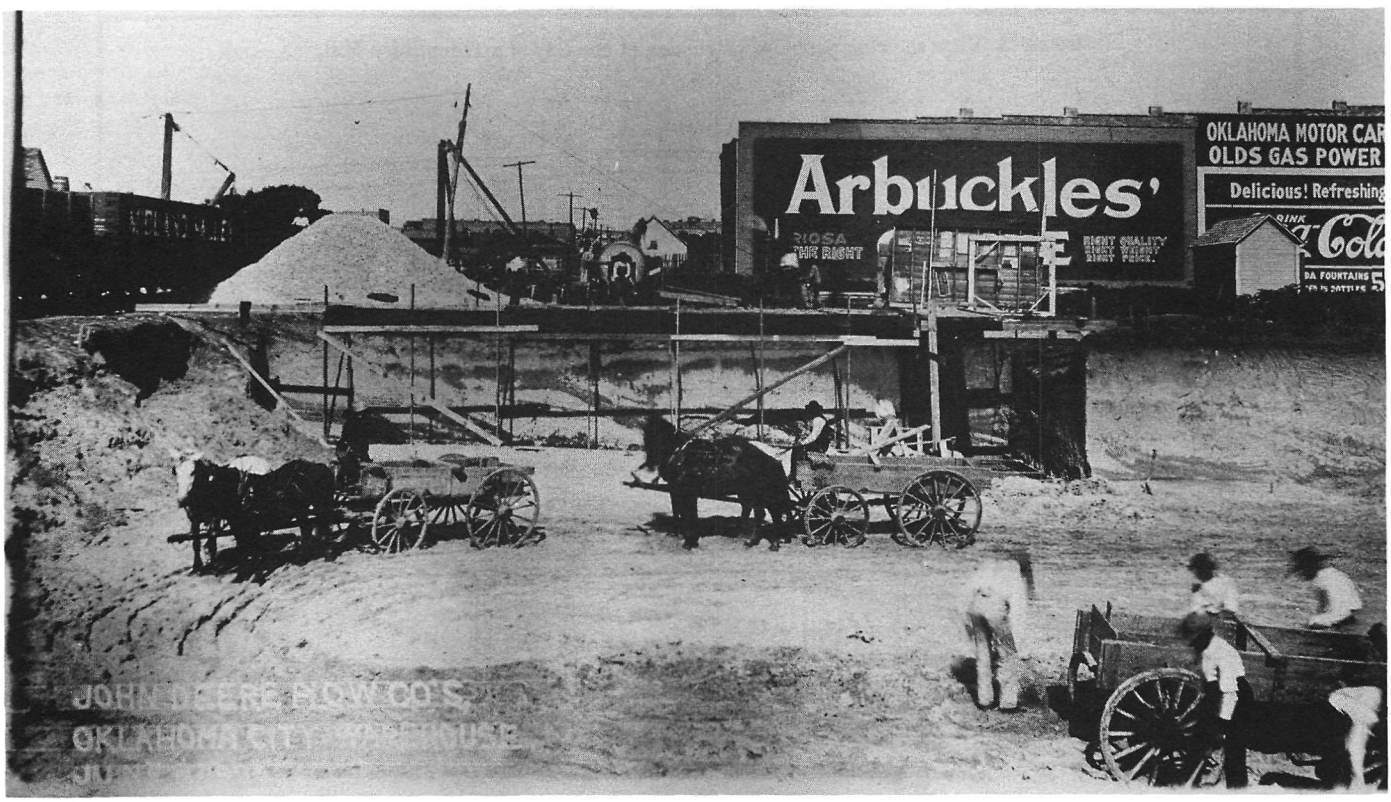
FIGURE 6. Capital Detail

SOURCE. Frank E. Kidder, *The Architect's and Builder's Pocket-book* (New York, 1885).

Kidder's book was simply a handy compilation of all the scientific structural knowledge then available and, significantly, it was dedicated to O.W. Norcross, H.H. Richardson's gifted builder. For architects, it provided a most useful source of ideas and a valuable set of minimum

FIGURE 7. John Deere Warehouse, Oklahoma City, Oklahoma Territory, June 2, 1906

SOURCE. Leonard-Martin Construction Company



standards. Faced with demands for larger buildings and wider bays, they increased the dimensions of their structural members until the posts were often fifteen inches in cross-section and beam depths were in proportion. In the midwestern adaptation, the columns were not round, as suggested by Kidder, but square with the exposed edges chamfered. All sorts of details were worked out to reinforce the joints where the load was greatest. Sometimes an extra piece of wood was used as a kind of impost block. Sometimes a cast-iron plate was added; these details were usually bolted rather than screwed. In some buildings one floor might be in mill construction, while the next would be done in cast iron. The choice appears to have depended on cost considerations, the nature of the problem and the preference of the owner. Often the purest mill construction is found in structures devoted to wholesale hardware and farm machinery, although exceptions naturally occur. Aside from its fire-resistant nature and flexibility, the system had other advantages. Ceiling heights could be varied by the simple expedient of specifying appropriate timber lengths at the mill. Furthermore, cheap wood was available from the forests of Minnesota and Wisconsin and moved easily over the newly established railway lines. Most of the warehouses and factories in midwestern cities were, therefore, of mill construction until World War I. The structural system itself, thus, was not new but the lengths to which it was pushed certainly were.

FIGURE 8. Concrete Mixing, John Deere Warehouse, Oklahoma City

SOURCE. John Deere and Company

The structural development of the American warehouse is a beautiful corroboration of the theoretical insight of James Fitch, offered over two decades ago. In 1958, Fitch noted that Americans have always avoided the load-bearing mass masonry wall which was our dominant heritage from Europe.

FIGURE 9. John Deere Warehouse, Oklahoma City, July 7, 1906

SOURCE. John Deere and Company

> The structural form which we did adopt, and which we have cultivated ever since, is the skeleton. There were two great virtues to skeletal structures. The first was purely technical; it was more efficient than mass masonry in resisting loads and because of its specialized curtain walls, could be made much more effective in repelling climatic attack. The second virtue was economic. The skeleton was *possible* in America as nowhere else in the modern world, because ample supplies of the proper materials, wood and steel were at hand. But it was *desirable* because the skeleton frame and its curtain walling are subject to a high degree of rationalization. The economics in labor were so pronounced that it has remained for three centuries our most popular structural form.[6]

A remarkable series of construction photographs of the John Deere Plow Warehouse in Oklahoma City shows clearly how these buildings went together (Figures 7-11). In May and June the site was being excavated by teams of men and animals with drag scrapers, exactly as had been done for centuries. No machines were employed on the job except for a steam-engine to mix the concrete and a simple derrick to hoist large structural members into position. In mid-summer the concrete was moved by squads of sweating barrowmen. The walls go up, and as they were simply screens no exterior bracing was needed. By late October, the building was substantially finished and the implement company would be able to distribute its product to the farmers of the territory in time for spring planting.

FIGURE 10. John Deere Warehouse, Oklahoma City, September 22, 1906

SOURCE. John Deere and Company

An extremely important innovation in construction occurred in 1907 when Oscar Eckerman used the reinforced concrete flat slab in his 300,000-square-foot warehouse

FIGURE 11. Completed Warehouse, John Deere and Company, Oklahoma City, December 5, 1906

SOURCE. John Deere and Company

for Deere and Company at Omaha. Although concrete had been known in the United States since the 1870s it was not used to any great extent in industrial construction until the first decade of the twentieth century. The years 1900-10, however, witnessed the invention and patenting of numerous plate and slab systems. Of these the most publicized was probably that of the Minneapolis engineer Charles A.P. Turner; it was this system that Eckerman, the architect for Deere and Company, used at Omaha and in other important warehouses at Spokane, San Francisco, and Portland. Athough the material was therefore widely used (by Eckerman and many others), no one was entirely sure how it worked in strict engineering terms, and few architects in the United States gave any thought to its proper expression. None the less the reinforced concrete slab or plate had obvious advantages in terms of its fireproof qualities and load-bearing capacities. These were great attractions for the warehouse builders, and by the outbreak of World War I the wholesale district contained a number of structures framed in this new material.[7]

The Warehouse: Design Sources

To a considerable extent the architects of mid-American cities were admirers of the commercial style in Chicago, but ironically the single most influential building in that city was unquestionably the Marshall Field Wholesale Store of 1885-86 by the Bostonian, H.H. Richardson (Figure 12). This building, now destroyed, was a favourite of Louis Sullivan, the leading theoretician of the Chicago School, and it served as a model for Sullivan's own Walker Warehouse of 1888. John Root, Sullivan's talented contemporary, also thought highly of Richardson, and there is a strong Richardsonian element in many of his best buildings, especially the offices and warehouse for the McCormick Harvesting Machine Com-

FIGURE 12. Marshall Field Wholesale Store, Chicago, Illinois. Architect – H.H. Richardson.

SOURCE. Chicago Historical Society

pany, built in 1884-86. These structures, which were widely known, offered the appeal of disciplined massing and the opportunity to organize an elevation through tiers of rhythmically related arches. This of course was Richardsonian-Romanesque, which, as many critics have remarked, was more Richardsonian than Romanesque.[8]

The architects were fortunate in their proximity to Chicago. Nowhere else in the western world was there such a concentration of first-class commercial and industrial architecture. Sullivan and Root were simply the leaders of a group of men whose work was as notable for its quality as its quantity. Standards in design were exceptionally high. Because of the great fire of 1871 and the poor soil conditions in the city there was a lively interest in building technology, and the architects and engineers cooperated closely on all major projects. It is not surprising, then, that the warehouse district of mid-American cities contain a large number of buildings that are outstanding in design and structure. Several of their architects emerged as worthy personalities in their own right, and they accomplished significant variations on the themes stated by the Chicago masters and produced many highly original buildings of their own.

NOTES

1. In this paragraph I have, of course, summarized large amounts of historical material. The best discussion of the development of the trade is James Vance, *The Merchant's World: The Geography of Wholesaling* (Englewood Cliffs, New Jersey, 1970).
2. Russell Sturgis, "The Warehouse and the Factory in Architectures," *Architectural Record*, Vol. 15 (1940), pp. 1-2.
3. United States, Congress, House of Representatives, *Report of the Secretary of the Treasury on the Warehousing System*, Executive Document, No. 32, 30th Cong., 2nd Sess., 1849. Information on Hartley is available in Quentin Hughes, *Seaport: The Architecture and Townscape of Liverpool* (London, 1964).
4. Theodore O. Sande, "The Textile Factory in Pre-Civil War Rhode Island," *Old Time New England*, Vol. 66 (1975), pp. 19-20.
5. Frank E. Kidder, *The Architect's and Builder's Pocket-book* (New York, 1885), p.375.
6. James Marston Fitch, *Architecture and the Aesthetics of Plenty* (New York, 1961), p.8.
7. I have discussed the transition to reinforced concrete in "Oscar Eckerman: Architect to Deere & Company, 1897-1942," *RACAR* (Canadian Art Review), Vol. 11 (1976), pp.89-99. For European developments, see Peter Collins, *Concrete: The Vision of a New Architecture* (New York, 1959) and Max Bill, *Robert Maillart: Bridges and Constructions*, trans. W.P.M. Keatinge Clay (New York, 1969). David Billington, *Robert Maillart's Bridges* (Princeton, 1978) has an important section on Maillart's early experiments with flat slab.
8. Professor James O'Gorman has published the definitive article, "The Marshall Field Wholesale Store: Materials toward a Monograph," *Journal of the Society of Architectural Historians*, Vol. XXXVII (October 1978), pp. 175-94. On Root, see Donald Hoffman, *The Architecture of John Welborn Root* (Baltimore, 1973).