

## Oscar Eckerman: Architect to Deere & Company, 1897-1942

In the years around the turn of the century the John Deere Plow Company undertook a major program of building expansion. Founded by the great John Deere (1804-1888), the man who made the first effective steel plow in the West, the company enjoyed first class leadership from his son, Charles Deere, an almost equally gifted businessman. Charles Deere (1837-1907) grasped the necessity of a distribution system which could also service the increasingly complicated farm machinery which the firm was producing. His case is parallel to that of George Eastman and several other great businessmen of the age who grasped the importance of the distribution function. He saw that it was not enough to make the best plow in the world; the product must also be distributed and serviced. Furthermore, he formed partnerships with other makers of agricultural equipment. In 1877 Deere and Mansur began to make corn planters at Ottumwa, Iowa, and in the next two decades the company took over distribution of the popular Success Manure Spreader made by Kemp and Burpee and of the J. M. Dain line of sweep rakes. By 1900 Deere & Co., was jobbing the products of four other non-competitive manufacturers, and its distribution system was the envy of the industry. The first branch selling houses were opened in St. Louis and Kansas City in the eighteen-seventies, and by the time of Charles Deere's death in 1907, there were fifteen, all but two of them west of the Appalachians. Obviously this great program of expansion required buildings to house it, and the man who designed most of them was Oscar A. Eckerman, one of the most important but least known architects in the history of American industry.<sup>1</sup>

Born at Moline, Illinois on April 19, 1873, Eckerman was the son of John Eckerman, a veteran Deere & Company employee. After attending Augustana College, he went on to the Chicago

Art Institute for the only architectural education which he ever received. There, in the fall and spring of 1892-1893, he took courses in cast drawing, perspective, and still life in charcoal, pen and ink, and watercolor. In later years he felt that this training started him off in the right direction. There is no record of his activities during the next three years, but on the basis of his executed buildings, one is inclined to suspect that he stayed in Chicago and worked as a draughtsman in one of the large offices, possibly D. H. Burnham & Company. There is a kind of family resemblance between many of Eckerman's buildings and certain industrial structures by the Burnham firm, notably their enormous warehouse for Butler Brothers of 1912. In any event, something of the directness of expression which has long been a Chicago characteristic must have rubbed off on him. Returning to Moline, he went to work for Deere & Company on January 1, 1897, and remained with the firm until his retirement in 1942. His newspaper obituary in 1950 remarks that during this time he personally designed practically all the buildings of the company. Men who knew him moderately well agree. In the office he was dignified, stern, and a stickler for detail; even today, old timers in the company will occasionally remark that a building has "the Eckerman touch." His associates recall that he was tall, immaculately dressed, had a passion for neckties, and was a man of strong likes and dislikes. His family life seems to have been unremarkable. He was married once, had two children, was a member of the First Lutheran

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1. The best available history of the early years of Deere & Co., is Darragh ALDRICH (pseud. Clara Chaplin Aldrich) *The Story of John Deere: A Saga Of American Industry*. (Minneapolis, 1942). For the period since the consolidations of 1911, there is only an article in *Fortune* (August, 1936), 72-77 and 152-164. The history of this fascinating company deserves to be written.



FIGURE 1. Exterior of St. Louis Warehouses. Oscar Eckerman, 1903–1905. Oscar Eckerman, Architect.

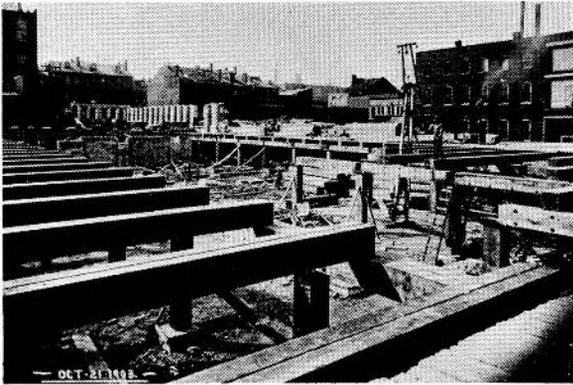


FIGURE 2. Construction Photograph, St. Louis Warehouses.

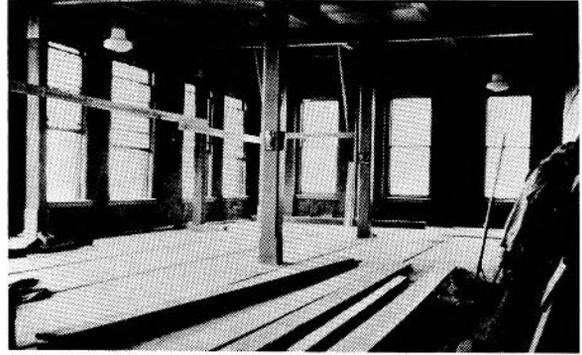


FIGURE 3. Interior detail, St. Louis Warehouses.

Church, and was active in the Masons and the Moline Elks. He also served on the local housing authority for several years and on the price and rationing board during the second World War. In short we have here a man who fitted nicely into the society of small town Midwestern America. His distinction was that he was able to give a great company exactly the buildings that it wanted.<sup>2</sup>

When Oscar Eckerman went to work for the John Deere Plow Company, Charles Deere's ex-

2. Material on Eckerman is scarce. His obituary in the *Moline Times Dispatch*, March 3, 1950 gives a few details; information of his education at the Chicago Art Institute comes from a letter to the author from Janice Harvey, Assistant Recorder, October 7, 1974. There is no record of his activities in the period 1894–1896.

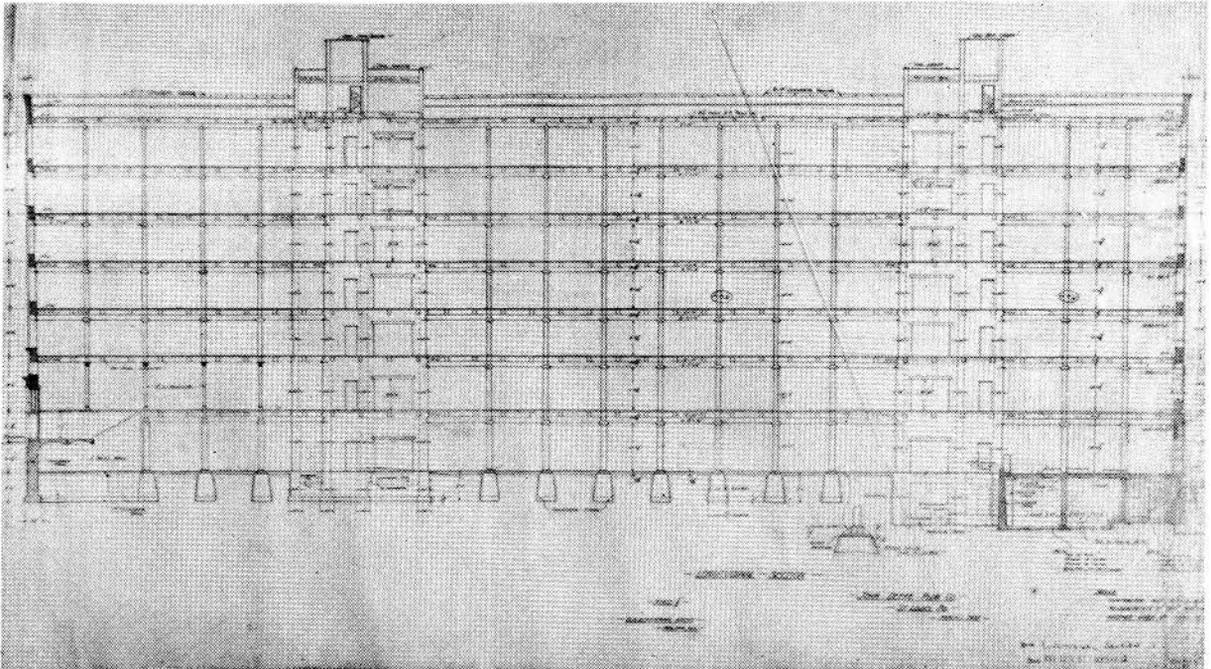


FIGURE 4. Longitudinal Section, St. Louis Warehouses.

pansion program was in full swing. His first buildings were probably additions to the existing plants in Moline, and thusfar have not been investigated. Among the earliest of his large branch warehouses was the pair of structures of 1903–1905 in St. Louis shown in (Figs. 1–4); photographs and drawings reveal that they were of mill construction. In effect they are gigantic brick and timber cages. The extremely heavy sill beams are bolted together, and the upright members are chamfered to diminish combustible surface in the event of fire. Insurance companies, in fact, played a major role in the development of this type of construction. The system was widely known even before its publication in the first edition of Frank Kidder's *Pocket Manual for Architects and Builders* in 1884, and by the time Eckerman started in practice, it had been used in a large number of Midwestern examples which would have been familiar to him. The massive timbers necessary for its use moved easily over the recently established railway network, and building with them was simple, rapid, and economical — important considerations for a company whose chief executive was deathly afraid of deficits. "What worried Mr. Deere," wrote an associate, "was that a spending spree would run away with itself. He always wanted to be on the safe side financially."<sup>3</sup>

Equally striking is a dated series of construction photographs showing the erection of the Oklahoma City warehouse in the summer of 1906; of these, four are shown here. The digging of the foundations by teams of mules, the pouring of the concrete by squads of sweating barrowmen, and the relation of the building to the townscape are vivid commentaries on the determination of Charles Deere to make his products available to the farmers of the territory. In structure, the building is simply a smaller version of the St. Louis warehouses. The planks carry the load to the joists, the joists to the girders, and the girders to the columns. The exterior expression of this system is also substantially the same as in St. Louis. The heavy timber frame required a regular grid of pier and spandrel, a perfectly logical revelation of the structural system. The piers received the beam ends and the wall, for which no exterior framing was needed, was nothing more than a screen. The only decoration was the famous leaping stag at the entrance. That was all there was to the buildings. (Figs. 5–8).

3. Max SKLOVSKY, as quoted in *Max* by Edith Sklovsky COVICH, (Chicago, 1974), 63.



FIGURE 5. Digging Foundations, John Deere Plow Co. Warehouse, Oklahoma City, June 2, 1906. Oscar A. Eckerman, Architect.



FIGURE 6. Basic Framing, John Deere Plow Co. Warehouse, July 7, 1906.

Both Deere and his architect must have felt like men who fell into the proverbial bucket of butter when they came upon the system of reinforced concrete flat slab construction invented by the Minneapolis engineer Charles A. P. Turner in 1905. In the Bovey warehouse in that city Turner developed what Carl Condit calls the first sophisticated system of reinforced concrete construction in the United States. It featured a grid of radial reinforcing and precast columns with mushroom capitals surprisingly similar to the contemporary designs of Robert Maillart in Switzerland. Although Turner was not exactly clear about how his system worked, he did know that stress was concentrated around

4. Details of the buildings are given in *Built by the Leonard Construction Company*, (Chicago, 1918). I have seen only a single copy of this remarkable booklet, and am grateful to Mr. W. A. Peters, Construction Manager with the Leonard Construction Co. (a division of Monsanto) for lending it to me.

the perimeter of the columns; hence he designed the characteristic flared capital, much as in a Doric column. Far more fire-resistant than the traditional mill construction, it could also take much greater floor loads. In the Omaha warehouse the panels were 18' 9" square, reinforcement was by sixteen  $\frac{3}{8}$ " rounds diagonally, and fourteen  $\frac{3}{8}$ " rounds directly from column to column. The building had a measured deflection of  $\frac{3}{8}$ " and a capacity of 550 pounds per square foot. Equally important, greater spans from column to column were possible with this system. The key dimension here is that of the standard American railway freight car which was (and is) 10' 6". The photograph shown here is particularly interesting because it demonstrates the introduction of the

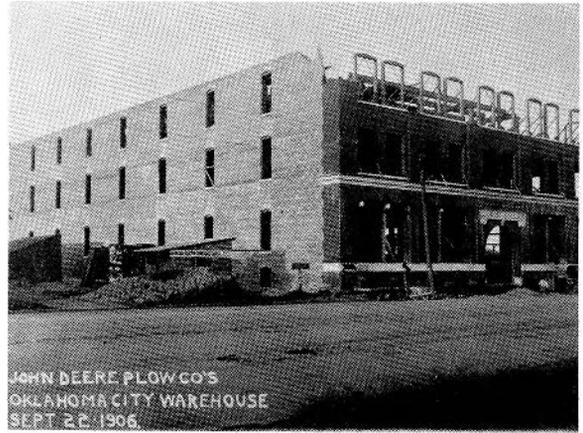


FIGURE 7. Deere Warehouse, Oklahoma City at completion of first two storeys, Sept. 22, 1906.



FIGURE 8. Completed Warehouse for John Deere Plow Co., Oklahoma City, Dec. 5, 1906.

freight car directly into the building. This, of course, meant all-weather loading and unloading. Finally, the Turner system offered great savings in construction time. The St. Louis branch houses required almost two years to build. For the Omaha building, Leonard & Company of Chicago, who were probably Eckerman's favorite builders, broke

ground in June, and the structure was ready for an implement dealers' convention on December 1, 1908. We show a series of six photographs of the building under construction and at completion (Figs. 9-14). The sample room, more highly finished than the rest of the building, was on the eighth floor. Perhaps it is hardly necessary to add



FIGURE 9. Omaha Warehouse for John Deere Plow Co., Omaha, Jan. 1, 1909. Oscar A. Eckerman, Architect.

that it had the lowest fire insurance rate in the United States for some years.

At this point, it is only proper to observe that the Turner system was the center of intense contro-

versy during the next two decades. A recent authoritative discussion remarks, "Because it escaped the imagination of minds trained in the two dimensions of timber and iron, the flat slab was



FIGURE 10. Omaha Warehouse under construction, Aug. 31, 1908.

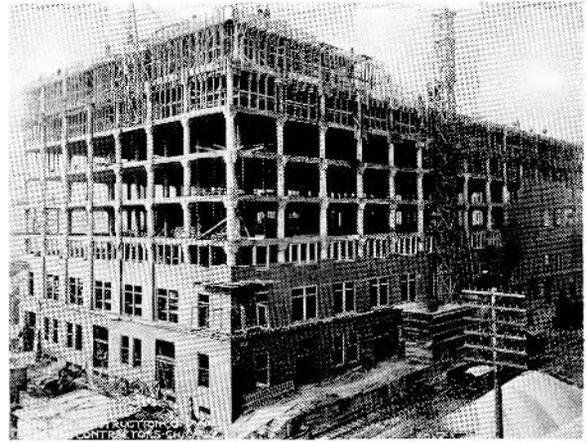


FIGURE 11. Omaha Warehouse under construction, Nov. 2, 1908.

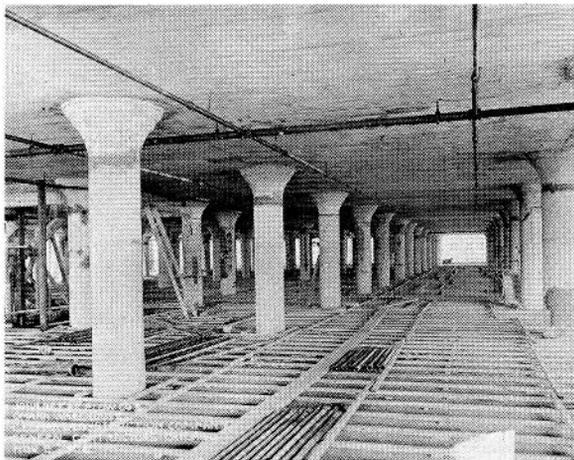


FIGURE 12. Unfinished Interior, Omaha warehouse, Nov. 2, 1908.

given the treatment of a miracle. While it was endorsed blindly by some engineers, it was resisted savagely by others.” Practicing engineers, college professors, and lawyers took part in the debate. The interest of the problem is illustrated dramatically by a comparison made by A. B. MacMillan in 1910 (Fig. 15). The bars indicate the amount of reinforcement required by various design procedures in a 20' x 20' interior panel of an eight-inch thick flat slab intended to carry 200 pounds per square foot. Evidently the material bill for steel could vary by 400 percent depending on the design method chosen. There was obviously



FIGURE 13. Entryway, Deere warehouse, Omaha.

room for argument, and indeed so many suits were launched that Turner came to have an almost Dickensian attitude toward lawyers. He made enormous efforts to differentiate his system from the Norcross patent of 1902, which was, “as a



FIGURE 14. Showroom for Deere warehouse, Omaha.

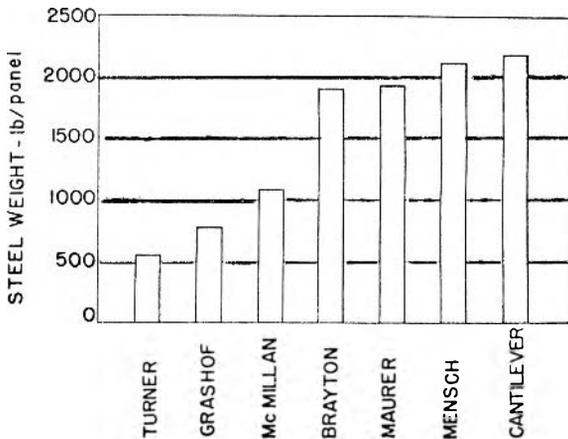


FIGURE 15. Weight of steel required in the interior panel of a flat slab by various design methods in 1910.

mason would understand it." for a slab thick enough to act as an arch, but by 1918 he was under injunction. The best recent discussions tend to uphold his theories stressing the importance of details such as his insistence on very high quality steel in crucial places. While Eckerman was certainly attracted to the Turner system, he was quite willing to use others where circumstances warranted it, and he also continued to use mill construction on occasion.<sup>5</sup>

We should also note here the role played by Leonard Construction Company of Chicago in the development of the flat slab. This extremely successful organization was the creation of Clifford M. Leonard, born in 1879 and educated at M.I.T., where he took a bachelor's degree in civil engineering in 1900. After a series of jobs as draftsman, estimator, and designer with various engineering and contracting firms in Chicago and St. Louis, he formed the Leonard-Martin Construction Company in 1905. In 1908 its title was changed to the Leonard Construction Company, and he became president, treasurer and general manager. By 1917 he was acting in the same capacities for a Canadian subsidiary, for the American Steel Window Company, and for the Flat Slab Patents Company. In this same year he had a winter residence on Lakeshore Drive and a

5. The best discussion of the flat slab problem which I have found is: Mete A. SOZEN and Chester P. SIESS, "Investigation of Multiple-Panel Reinforced Concrete Floor Slabs," in *Journal of the American Concrete Institute* (August, 1963), 999-1027. This article is noteworthy not only for its scholarship but also for its humor.

6. *The Book of Chicagoans*, (Chicago, 1917), 409-410.

summer place in Lake Forest, and was a member of the Chicago, Onwentsia, Indian Hill, and Shore Acres Clubs — substantial social and economic recognition for a man still under 40. Leonard seems, in fact, to have been an unusual combination of the gifted engineer and successful businessman. While he perhaps did not grasp the theoretical nuances of the Turner patents, he was quick to see their importance, and to form a large organization specializing in flat slab construction. An associate who recalled him well characterized him as "quite a promoter." In addition to the jobs for Deere and Company, he did an immense amount of work for the Quaker Oats Company, most of which also involved concrete construction. It may well be that the Leonard Construction Company was as important for concrete work in the United States as the Starrett Brothers were for skyscrapers framed in steel.

To understand the interaction of structural design, architectural design and materials handling in this fine building, one must begin with the fact that agricultural implements in those days came in bundles. A bundle, according to Nathan Lesser, Eckerman's close friend and collaborator, was a package which could be moved on a hand cart by two men. For some reason most of the men who did the moving were Belgian immigrants; when the fork lift came in and changed the entire nature of the game, the men in the plants called them "Electric Belgians." The plow, hay rake, corn planter, or whatever, therefore entered the warehouse on a freight car, was moved in bundles by elevator or hand cart to its storage quarters, and distributed in the same series of bundles. With the aid of a set of directions, and perhaps a local representative, the farmer could then assemble the machine. If service was required, the Deere representative would be there, as he still is today.

This, then, was the theory of the distribution system. To make it work within the warehouse several technological innovations were required. Most of these were the contribution of Max Sklovsky (1877-1967), another unnoticed genius in the history of American industrial technology. Given the vast size of these structures it became necessary to devise a means of moving goods through them in addition to the hand carts. Sklovsky solved this problem with an arrangement of overhead conveyers adapted from the stockyards. For vertical circulation it was also desirable to have an auxiliary to the freight elevator, which was always overloaded. Sklovsky therefore invented a helical chute with baffles to slow down the bundles. While Eckerman himself

seems to have had very little technological education, it is a matter of record that he was a close friend of Sklovsky. The best explanation for his quick grasp of the new structural system is surely that some of Sklovsky's gadgety-mindedness rubbed off on him.<sup>7</sup>

In addition to these constraints, buildings for the storage and movement of farm machinery had other requirements. Bundles of farm machinery weighed more than equivalent bundles of groceries and dry goods, and these buildings had to be able to take greater floor loads, which, as we have noted, they easily accommodated. We have also observed that it was desirable to introduce the freight car directly into the building for ease of all-weather loading, and unloading and this objective, too, was more easily achieved with flat slab concrete. The requirement of fireproof construction was traditional. On the psychological side, the exhibit areas had to be comfortable but show a certain overall plainness. Nathan Lesser writes that there was a saying in the company in those early days, "Don't overspend, for our farmer customers are thrifty souls, and if they see us spend wastefully, they may lose confidence in the farm equipment which we offer for sale."<sup>8</sup> This is certainly a fascinating constraint, and it is the background for the great building on Howard Street.

So much for technology, dates, and program. What is particularly striking is the continuation and refinement of the architectural expression of mill construction. Upon analysis it will be seen that both the heavy timber frame and the flat slab systems are basically skeletons. True, they are skeletons with different structural characteristics, load bearing capacities, and fireproof qualities, but they are still skeletons. In the Oklahoma City warehouse the exterior piers and spandrels correspond to a grid of posts, planks, and girders. The photograph of the Omaha showroom demonstrates conclusively that each pier encased a concrete column and that the spandrel took the edge of the slab. In essential nature the architectural expression is similar, but in Omaha there is a greater refinement of proportion and detail — the mature Eckerman touch. The sense that the wall is simply a brick screen is much greater, and there is a stronger feeling of resemblance to such masterpieces in steel as Sullivan's Wainwright building in

St. Louis of 1891 and the Prudential Guaranty in Buffalo of 1895. Like these buildings, the Deere warehouse can be read as base, shaft, and capital. Further, Eckerman resolves the corners into powerfully expressed towers; a strong corner is, after all, in the conservative tradition. A minor dichotomy is at the entry way, where classical pilasters are curiously juxtaposed with light fixtures which look as if they might have been designed by Sullivan or Elmslie. The only ornament is, of course, the famous leaping deer, but the structure itself, like Eero Saarinen's headquarters building of 1960, is a superb image for the company. It conveys strength and stability, which is exactly what John Deere himself would have wanted.

Since the buildings are of almost exactly the same date, a comparison of the Omaha warehouse with the famous turbine factory of 1909 for A.E.G. by Peter Behrens in Berlin is instructive (Fig. 16). Behind the Behrens building there is a carefully organized body of theory by which the architect sought to work out a new aesthetic for the industrial age. There may also have been the highly intellectual patronage of the Rathenau family. By the time of this factory Behrens (b. 1869) had already gone through a Jugendstil phase, and it is highly probable that he was in touch with many advanced currents of European thought. By comparison, Oscar Eckerman was a country boy. His only contact with the great world of architecture was a brief period in Chicago. Within the constraints of program, budget, and structural system, he simply designed a direct, forceful, pragmatic solution to the architectural problem. Many years ago in an important article on "The Chicago Frame," Colin Rowe compared Victor Horta's Maison du Peuple of 1897 in Brussels with Holabird and Roche's McClurg Building in

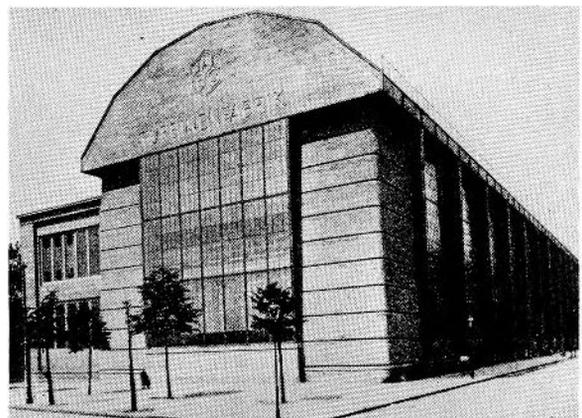


FIGURE 16. Turbine Factory for the A. E. G. Peter Behrens, Berlin, 1909. Peter Behrens, Architect.

7. Letter from Nathan Lesser to the author, February 24, 1974, and personal conversation, July 10, 1974. The overhead conveyor is illustrated in Edith COVICH's, *Max*, 79.

8. *Ibid.*

Chicago of 1899-1900. He noted that Holabird and Roche's structure was primarily a building and that Horta's was a polemic.<sup>9</sup> Similarly, on seeing the comparison of Eckerman's Omaha warehouse and the turbine factory, an eminent Dutch art historian remarked to me that the latter appeared, "a little neurotic."

Likewise the Deere warehouse has nothing to do with the imagery of the factory as it developed in the Soviet Union after the Russian Revolution. Adolf Max Vogt has convincingly demonstrated in his *Russische und Französische Revolutions-Architektur* (Verlag Dumont Schauberg, 1974) that the early Soviet architects thought of the industrial structure as the building type whose form should govern all others. Buildings were deliberately conceived to resemble factories whether they were schools, universities, clubs, or theatres. There was, of course, a great deal of support for this position in Marxist theory, which sanctified the "arbeitsmotiv" as a dominant element in the New World Order which Marx saw emerging in the great conflict between the bourgeoisie and the proletariat. Soviet architects, nonetheless, could not get away from the models of industrial architecture which had already been achieved in capitalistic Western Europe. Vogt shows four projects for the University of Minsk in which one can easily pick out features of Behren's Turbine Factory in Berlin and Gropius' shoe last factory at Alfeld an der Seine of 1911. All are distinguished by large expanses of glass, and that nineteenth-century symbol of modernity, the radio antenna. In contrast there is nothing overtly symbolic about Eckerman's Deere warehouse except the inevitable leaping stag at the corner tower as an emblem of corporate identity. From the Marxist angle the building would probably have been a perfect example of capitalist exploitation. The company, on the other hand, was (and is) very proud of its contribution to agricultural progress, especially of the Gilpin plow — "the plow that took the farmer off his feet." Maybe there is, after all, something to the old adage that one of Marx's difficulties was that he was a city boy.

After the triumph at Omaha the Deere building program went forward with enormous vigor. The distribution system ultimately included facilities in

9. Colin ROWE, "Chicago Frame: Chicago's Place in the Modern Movement," *Architectural Review*, 120 (November, 1956), 285-289.

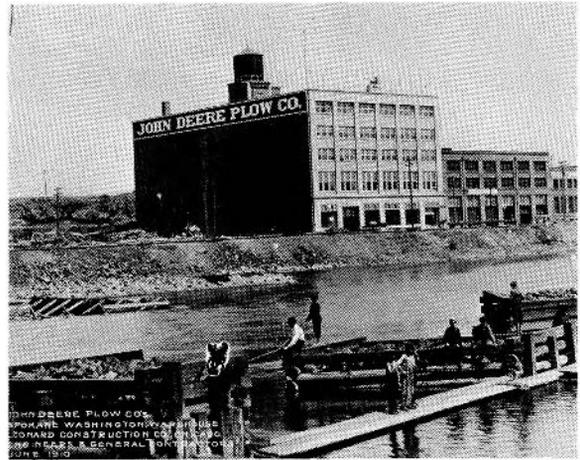
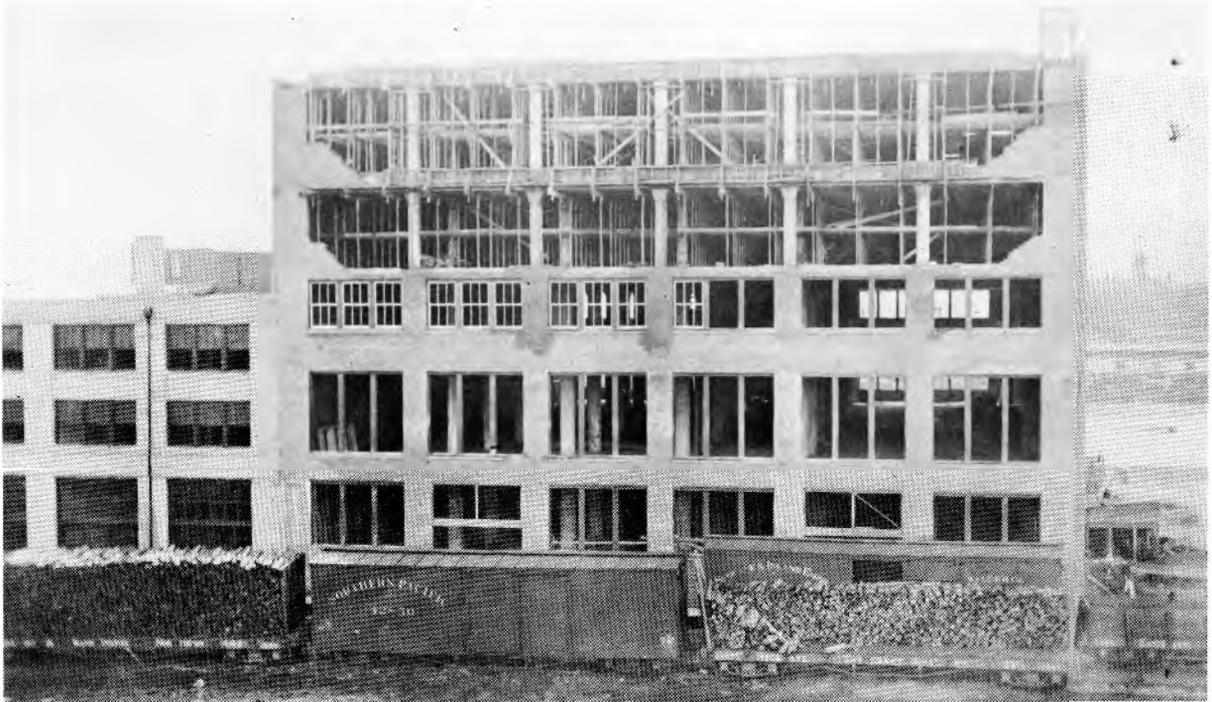


FIGURE 17. Spokane Warehouse for the John Deere Plow Co. 1910. Oscar Eckerman, Architect.

Minneapolis, Kansas City, Missouri, Milwaukee, Dallas, Chicago, Portland, Oklahoma City, San Francisco (an early earthquake resistant structure), St. Louis, New Orleans, Sioux Falls, Baltimore, Bloomington (Illinois), Indianapolis, Atlanta, Spokane, Winnipeg, Regina, Saskatoon, and Calgary. This was in addition to an immense amount of strictly industrial construction such as foundries and factories in the Moline area. The sheer volume of Eckerman's production staggers the imagination. It can only be compared with that of Albert Kahn, who, however, (and it is an immensely significant difference) was never a company architect. In this tremendous volume of production the concrete flat slab was used wherever possible. A typical example is the Spokane branch house, built by Leonard & Company between November 1907 and June 1909 (Figs. 17-18). This building was sited close to a network of railroad tracks and warehouses called the Spokane International Terminal Grounds. The railroad tracks were and still are located exactly adjacent to the north side of the building raised from the ground about the height of a freight car. The efficient transfer of farm machinery from railroad car to warehouse was obviously an important design determinant. There are, however, other considerations as well. The south elevation has one of the most visually prominent locations in the city, and it had to be designed for maximum impact. Here again Eckerman used a grid of pier and spandrel, and relied on a huge sign, and the famous logo — a leaping deer — to carry the company's message. On the exterior the columns are entirely surrounded with brick and are therefore expressed as rectangular pilasters. On the interior they are exposed in varying degrees of finish. The ground



floor offices and show rooms have the connections to the wall neatly articulated while at the upper warehouse floors there is rough brick all around. The framing is simply a 16' x 18' column grid with flat slab floors and roof. The columns range in diameter from 26" at the basement floor to 18" on the fifth floor.

In short, the building looks exactly like what it is: a large and well-ordered container for heavy industrial goods, a structure which makes a strong but subdued contribution to the city's total environment. It is not oriented to the pedestrian in any way, though it possessed the usual comfortably furnished offices and sales rooms on the first and second floors. Finally it may be noted that the total building cost was just over \$100 000 for 100 000 square feet of floor space. This is the kind of statistic that is easily comprehensible. No wonder that the company liked Eckerman. The structure remained in use as office and storage space for the Spokane World's Fair until only a few years ago.<sup>10</sup>

The Spokane warehouse, then, may be regarded as typical of the large number which were built in



FIGURE 18. Construction Photographs of Spokane Warehouse for John Deere Plow Co.

the period 1907-1914. Each, of course, had some distinctions. In San Francisco, as we have noted, an earthquake proof design was used. In Portland the ground floor was opened up for display of farm equipment. In the Canadian examples (Regina, Saskatoon, Calgary) Eckerman used mill construction, perhaps because of the unavailability of concrete technology in that area or possibly because no one was entirely sure how the flat slab would behave in extremes of temperature. An interesting construction shot at Regina in May,

10. For recent information on the Spokane warehouse I am indebted to Professor Grant Hildebrand of the University of Washington in a letter of October 14, 1974.

1913 is a commentary on the relationship of the building to the surrounding prairie landscape, and two contemporary photos indicate its present condition and the high quality of brick detailing, the means by which an otherwise undistinguished building attains substantial interest (Figs. 19–21).

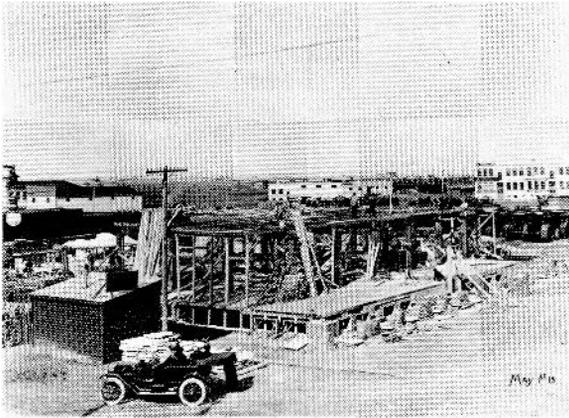


FIGURE 19. Construction Photograph of Regina Warehouse for Deere & Co., May 1, 1913. Oscar Eckerman, Architect.



FIGURE 20. Recent Photo, Regina warehouse of Deere & Co. Oscar A. Eckerman, Architect.



FIGURE 21. Brick detail, Regina warehouse of Deere & Co. Oscar A. Eckerman, Architect.

It would be fascinating to know if Eckerman was conscious of his own achievement and the limitations imposed on him by his position with the company. According to his close associates he was a man of fine intelligence, thoroughly conscious of what was going on in the architectural world around him. Undoubtedly he knew the work of the Chicago architects, and he may well have admired such great buildings as Richard Schmidt's superb Chicago warehouse for Montgomery Ward of 1906–1908. In all probability he knew the outstanding buildings of Kahn for the auto industry. In his own work, however, he had to grapple with tight budgets and superiors who knew that he had discovered a inexpensive, sound, and speedy method of putting up the buildings that the company required. The program and specifications varied only a little from job to job, and it was really inevitable that architectural design would be reduced to a formula. The great breakthrough came at Omaha and after its success, the formula was simply repeated with variations. This meant a consistency of quality — the Eckerman touch — but a lack of high points.

In a sense Eckerman's situation was in the Deere tradition of anonymity. Far more than with most American corporations of its size, the men responsible for its success are unknown to the public. Sklovsky, for example, never received anything like the recognition given to Steinmetz at General Electric, Kettering at General Motors, or Lee DeForest at R.C.A., and yet he kept Deere & Company at the forefront of technological change in the agricultural implement industry for over thirty years. So, too, with Eckerman. His contribution is all but unknown, and yet it was vital to the distribution system which made the company great.

Today the last of Eckerman's warehouses owned by Deere is the Omaha branch at 9<sup>th</sup> and Howard: about 40 employees remain in the company's parts depot and wholesale goods distribution operation. Administrative sales have been transferred to branches in Kansas City, Minneapolis, and East Moline, Illinois. The transfers are part of a program to operate from fewer but larger locations where computerized marketing services are available. Hence the company is using only a small part of the building's 324 000 square feet of space. The structure lies directly adjacent to the proposed Riverfront Development of Omaha, and it would be a shame if Eckerman's monument could not be fitted into the plan.

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