

Lessons from Lustron

An analysis of the greatest attempt to solve America's housing problem through factory mass-production techniques

Working Paper 475

This paper was written during the author's enrollment at Harvard University, and was intended for an academic audience with a certain level of subject familiarity. The author wishes to thank Leland Cott, FAIA, professor of urban design and principal of Bruner/Cott & Associates.

It is the author's desire that the information contained herein be publically available and accessible as an educational aid. Every reasonable effort has been made to conduct scholarly research and present relevant findings in a meaningful and unbiased way.

Disclaimer: This paper is presented solely for educational purposes. The author accepts no liability for the accuracy of the information or opinions contained herein, or for the actions and decisions of any individual who chooses to read it.

NOTE: All images included in the original paper and appendices have been removed for legal (copyright) reasons.

It is intriguing how for hundreds of years architects, engineers, and inventors have sought to industrialize housing production and to bring the housing industry into the high-tech modern age of mass production. There is a reoccurring obsession with each generation to find a rational, efficient method to mass-produce traditional housing by machine. Though the means of production of almost everything in our daily life has changed radically since the Industrial Revolution, the process of constructing houses remains much the same as it always has been. While our transportation, communication, clothes—even the production and processing of our food—have all been industrialized, our home delivery process has not. Is it because people will not accept factory-built houses? Is there something inherently wrong with such a proposal? Though often touted, this does not seem to be the case. After all, the constant attempts by well known architects seem to suggest otherwise: that a well-designed factory-built house would sell—and could solve the problems of affordability, availability, and quality of housing. Yet time and time again, inspired attempts suffer the same dismal fate. What is our obsession with mass-produced, factory-built housing, and why has almost every attempt to introduce it into the United States failed?

Critics have often blamed the inferiority of the factory-built home for its lack of acceptance in the United States. Indeed, many people will agree with this, citing stereotypical images of the decrepit mobile home in the trailer park as the quintessential proof of the failure of manufactured housing. They seem to suggest that if a product comparable to a traditional, site-built home were able to be manufactured at a reasonable cost, Americans would not be so resistant. Complex studies have sought to better understand specific aspects of manufactured homes that are deemed inferior to traditional

homes, and why the general public will not accept them. But at the end of the day, product inferiority and lack of public acceptance are not the reason for the historic failure of manufactured housing in the U.S. A close analysis of the rise and fall of the Lustron Corporation (1946-1951) is very revealing.

The Lustron Corporation was “the largest and most completely industrialized prefabricated housing company in the history of the United States¹.” Led by visionary Carl Strandlund, it was an attempt of unprecedented scale to integrate assembly line techniques into the production of housing. In essence, what Henry Ford did for automobiles, Strandlund dreamed for houses. His design for a maintenance-free, mass-produced porcelain-enameled house promised an “affordable single family dwellings for wage earners²,” and was marketed as “A New Standard for Living,” “The House America Has Been Waiting For³.” With twelve million veterans returning from war and the government unsure of how to house them, Strandlund’s promise of 400 houses a day⁴ sounded good. The Reconstruction Finance Corporation (RFC) unanimously⁵ approved a \$15.5 million loan to Lustron, and later several additional loans totaling \$22 million. With a 1,000,000+ s.f., state-of-the-art factory and \$37.5 million financing, Lustron had more capital invested than all of the next 40 largest prefab companies combined⁶. Nevertheless, in less than five years, undermined by an array of problems and unable to make payments on its loans, the troubled Lustron Corporation collapsed.

¹ Douglas Knerr, ‘The House America Has Been Waiting For’: The Lustron Experiment in Factory Made Housing, 1946-1954’, Ph.D. diss., (1996), abstract

² ibid, abstract

³ Douglas Knerr, Suburban Steel : the magnificent failure of the Lustron Corporation, 1945-1951, (Columbus 2004), p. 2

⁴ Strandlund originally promised to deliver 400 houses a day, if given \$52 million. But ultimately, with a smaller loan and limited allocation of steel, etc., he aimed at a more conservative 100 houses per day. Lustron: the house America’s been waiting for, DVD (2002)

⁵ Douglas Knerr, ‘Suburban Steel’, (Columbus 2004), p. 95

⁶ ibid, p. 120

Before exploring the reasons for failure, it is important to point out the way in which the Lustron homes were embraced (by the public, the press, and the government). The postwar setting was perfect, and Strandlund's idea seemed promising and well-conceived. Without understanding the true reasons for failure, it is easy to simply dismiss the lessons learned by Lustron and to try the same thing all over again, assuming that the product was flawed, the government was fooled, and we can do better today.

If any person were qualified to lead the way, Carl Strandlund was that person. Often compared to innovators such as Thomas Edison and Henry Ford, Strandlund was a mechanical genius and a successful businessman. He had an impressive resume, and more than 150 patents⁷ to his name. During the war he had gained civilian war hero status by inventing a much faster process for armoring tanks. With his new idea for affordable housing, he was viewed as a savior of the underprivileged. To get the Lustron home into the mainstream, Strandlund set up model houses in twenty cities, which became tourist destinations for over 1.5 million visitors⁸. Several families, waiting in line in the rain to visit the house on the corner of Fifty-Second Street and Sixth Avenue in New York City, told reporters that they had made the Lustron tour “the centerpiece of their vacation to the city, but granted that the Empire State Building was impressive as well⁹.”

The Lustron homes had enormous market appeal. They proved that American's would accept prefabricated homes—even steel homes—thus dismissing the claims (before and since) that Americans will never give up their site-built homes. Lustron's first published national advertisement elicited 50,000 responses in one week, more than other

⁷ Strandlund's patents were on improvements to agricultural equipment and industrial processes. Douglas Knerr, 'Lustron: How an Ohio Company Almost Changed American Housing', *Timeline*, Vol. 22 (April–June 2005), p. 20

⁸ 'Trend-Setters Housing', *Kiplinger Magazine: the Changing Times* Vol. 3 (April 1949), p. 37

⁹ Douglas Knerr, 'Suburban Steel', (Columbus 2004), p. 105

add in the history of Life magazine¹⁰. The homes proved themselves to be an immediate success at Quantico Marine Base, and soon big developers wanted them too. American Community Builders (developers of Park Forest, Illinois) requested 2,000 of them¹¹. The Strategic Air Command and Westover Air Force base needed 3,400. As the franchised dealers often reported, the home sold itself. Not only did people like the product; they also wanted in on “the biggest new industry.¹²” Alfred P. Sloan, chairman of General Motors, called Lustron “the greatest industrial opportunity since the development of the automobile¹³,” and Norman Brokenshire told radio listeners across America that Lustron was “the greatest single development in housing since they first put one stone on top of another¹⁴.” Like the Titanic, the Lustron Corporation was considered unsinkable. There was so much faith in its success that Senator Ralph Flanders boldly stated: “If Lustron doesn’t work, let us forever quit talking about the mass-produced house¹⁵.” Yet despite the magnificent success of the product, the overall endeavor to introduce factory-prefabrication into the home-building industry in the U.S. did not succeed. One has to wonder what went wrong.

Though the homes themselves were very successful overall, there were some serious objections and disadvantages. Some are unique to Lustron, while others are typical of the prefab industry. Had the Lustron Corporation lasted beyond its infancy, these issues might have undermined the company’s success in the long run.

¹⁰ Lustron: the house America’s been waiting for, DVD (2002)

¹¹ Thomas T. Fetters, The Lustron Home: The History of a Postwar Prefabricated Housing Experiment, (Jefferson 2002), p. 90

¹² Lustron: the house America’s been waiting for, DVD (2002)

¹³ Douglas Knerr, ‘Lustron: How an Ohio Company’, (April–June 2005), p. 30

¹⁴ *ibid*, p. 19

¹⁵ ‘The factory-built house is here, but not the answer to the \$33 million question: How to get it to market?’, Architectural Forum Vol. 90 (May 1949), p. 107

Problematic Implications of Material Choices: It is quite impressive when one considers the fact that Lustron was able to market a house made entirely of the same material as a bathtub. From the walls, ceilings, and built-in shelving, to the roof and exterior siding, the entire house was porcelain-enameled steel. Only the concrete floor slab and asphalt tile finish¹⁶ were not made of steel. Porcelain-enameled steel had recently become a material of choice for major oil companies, who preferred it over other types of construction because it had the lowest maintenance costs¹⁷, and because they believed the sleek, modern look was powerful in creating a brand image. The porcelain-enamel was impervious to moisture, easy to clean, and did not weather or discolor¹⁸ over time. (Surveys of Lustron homes since the 1980s have borne testimony to the extreme durability of the material.) It did not decay, burn, or support vermin infestation. It also protected the steel from oxidation¹⁹. With so many improvements over the performance of pure steel, and a new radiant heating system that took advantage of steel's thermal conductivity, Strandlund was convinced that he had overcome the various hurdles that had prevented the success of previous steel-house builders²⁰. He also believed that his innovative "new" prefab techniques were unique from those of his contemporaries, who simply "transferred the traditional materials and methods from the building lot to a factory."²¹ Rather than try to mimic traditional stick-built construction, Strandlund played up the advantages of steel and offered Americans something new. From his utilitarian, efficiency-obsessed point of view, porcelain-enameled steel was the home-building material of the future.

¹⁶ 'Lustron Corporation Develops an Enameled Steel House', Architectural Forum Vol. 86 (June 1947), p. 106

¹⁷ Thomas T. Fetters, 'The History of a Postwar Prefabricated', (Jefferson 2002), p. 144

¹⁸ Robert A. Mitchell, 'What ever happened to the Lustron Homes?', The Association for Preservation Technology Bulletin Vol. 23, Iss. 2 (1991), p. 48

¹⁹ 'Lustron Corporation Develops', Architectural Forum Vol. 86 (June 1947), p. 106

²⁰ *ibid*, p. 105

²¹ Douglas Knerr, 'Suburban Steel', (Columbus 2004), p. 93

Aside from chipping along the panel edges²² (where the steel was least flexible), the material itself performed surprisingly well. But the permanence and inflexibility of steel had its problems. For starters, the houses lacked variety and interchangeability, and a major complaint was that they could not easily be repaired or renovated. Altering the factory settings was prohibitively expensive, so customization was not an option. (Strandlund eventually hired Carl Koch and several other Boston-area architects to help improve the flexibility and interchangeability²³ of the houses and their elements.) Whereas with traditional stick-built construction, a homeowner could hire almost any contractor or handyman to fix or add to his/her house, with Lustron houses, not only were extra materials difficult to acquire, but also builders were untrained in dealing with such foreign materials. It did not help that many traditional builders and suppliers considered metal prefabrication a threat²⁴ to their livelihoods, and resisted it.

Inflexibility was a problem in several ways. For one, as a family grew in size (or wealth), the house could not change to suit their needs. Color was also permanent. The houses came in several colors based on user preference, but people soon realized that having permanent colors in a world where trends are constantly changing was problematic. Ornamentation²⁵ and built-in furnishings also had to be chosen with care, since everything was essentially unchangeable. No other products could be substituted, and nails²⁶ could not be hammered into walls/ceilings to hang things. This made it hard for homeowners to add identity or to express their personal tastes²⁷ in their own homes. Even though the final

²² Robert A. Mitchell, 'What ever happened', The Association for Preservation Technology Bulletin Vol. 23, Iss. 2 (1991), p. 50

²³ Ruth E. Knack, 'Prefab's Recurring Promise', Inland Architect Vol. 31 (March 1987), p. 14

²⁴ Michelle C. Saxman, 'The Lustron Home: An Experiment in Steel', South Dakota History, Vol 36, Iss. 4 (2006), p. 357

²⁵ *ibid*, p. 341

²⁶ Lustron: the house America's been waiting for, DVD (2002)

²⁷ Douglas Knerr, 'Suburban Steel', (Columbus 2004), p. 113

design represented the culmination more than 200,000 man hours²⁸ of planning, design, and process engineering, the “one-size-fits-all” reality was problematic. While all of these problems might have been acceptable in the postwar seller’s market, in softer markets this lack of variation was a significant deterrent²⁹.

Another problematic aspect related to materiality that Strandlund seems to have overlooked when he placed his bets on steel houses, were the sensitivities of the veterans upon returning from the horrors of war. (After all, these were the people he claimed to be building the houses for—the people because of whom the RFC was supporting him.) Many soldiers had been forced to live in prefabricated, or temporary units during the war. Part of the reason for the rise in interest and investment in the steel prefabrication industry was the need for flexible and quickly-erectable housing for the soldiers overseas. More than 200,000³⁰ prefabricated units had been constructed for use during WWII. When the soldiers arrived home, one can only assume they wanted the feeling of home—of permanence and place—not a constant reminder of war. Whether steel houses were appropriate for veterans is questionable. As one critic noted, “the high-tech horrors of the military experience—from the Holocaust to the A-bomb—had led Americans to seek more traditional, nostalgic havens³¹.”

Even despite the material limitations and implications, a good number of people still embraced the Lustron homes. But there were deeper problems with the unconventional material choice. Most troublesome was the animosity and eventual censure Lustron endured as a result of using steel. Each Lustron home required 11 tons³² of steel, which at 100 houses per day was equivalent to 400,000 tons of steel per year. The government could

²⁸ Thomas T. Fetters, ‘The History of a Postwar Prefabricated’, (Jefferson 2002), p. 146

²⁹ Barbara M. Kelly, ‘Suburban Steel : the magnificent failure of the Lustron Corporation, 1945-1951’, Review, Journal of American History, Vol. 92, Iss. 1 (2005-2006), p. 286

³⁰ Douglas Knerr, ‘Suburban Steel’, (Columbus 2004), p. 9

³¹ Barbara M. Kelly, ‘Suburban Steel’, Review, Journal of American History, Vol. 92, Iss. 1 (2005-2006), p. 286

³² Lustron: the house America’s been waiting for, DVD (2002)

only allocate 60,000 tons/year to the prefab housing industry, and though the lion's share went to Lustron³³, materials were still limited. This evoked an enormous amount of fury and tension from other prefab housing companies and steel fabricators. These prefab companies saw no reason why a new competitor should receive such an unfair advantage (steel and investment capital), and complained of government favoritism and destruction of the free market³⁴. Steel fabricators questioned the rationale for dedicating 60,000 tons of steel/year to build 6,000 prefabricated steel houses, when one could instead use the same steel to build 40,000 conventional houses³⁵? But because the government was so financially vested in Lustron (by virtue of the RFC's \$37.5 million loan), it could not afford to be "fair" to the other players in the industry. The conflict of interests was obvious. "We cannot but conclude," alleged the president of one steel company, "that the government is seeking to protect its own investment at the expense of private industry³⁶" (C.J. Rodman, president of Alliance Ware, Inc). All of this controversy kept Lustron in the political spotlight, heightening government expectations and increasing the pressure for immediate success³⁷. More than product flaws or marketing barriers, this increased pressure and oversight due to Lustron's government assistance and the jealousy/suspicion it evoked crippled the company before it even had a chance.

Inherent Controversy in Changing an Entrenched Industry: The housing delivery system in the United States is extremely complex, with many players and stakeholders. Whether or not it is the most efficient system, it is well established and entrenched. It involves socio-economic and political entanglements which are "woven deeply into our

³³ Douglas Knerr, 'Suburban Steel', (Columbus 2004), p. 122

³⁴ 'First Industrialized House Looks Like a Sure Bet as Lustron Clinches Loan', Architectural Forum, Vol. 89 (August 1948), p. 14

³⁵ Douglas Knerr, 'Suburban Steel', (Columbus 2004), p. 122

³⁶ 'Sure Bet', Architectural Forum, Vol. 89 (August 1948), p. 14

³⁷ Douglas Knerr, 'Suburban Steel', (Columbus 2004), p. 12

institutional fabric as well as into our psyches³⁸.” Though as architects and engineers we often seek for smarter, more effective ways of building homes, the inefficiencies and multiplicity of players (which cause the higher costs) make the housing industry an enormous wealth machine. If anything, inefficiency is fostered by the housing industry, not condemned. After all, for those who make their living in construction (or supplying materials, etc.), producing houses is not the goal. It is simply the means to an end, for profit and a sustained livelihood. The reason the industry still builds homes the way it does is not because no innovator has developed a better way, or because consumers will not accept non-traditional houses. Rather, it has everything to do with the fact that there are many interests at stake, and much wealth to be protected. Any “alternative,” more efficient method undercuts the market competition and can only be expected to warrant jealousy and conflict, even foul play.

Historically, prefab housing companies were crippled by undercapitalization³⁹, unfavorable codes/zoning, and limited public acceptance. They did not have the capital or the consumer base necessary to achieve economies of scale and to sustain a revolution within the industry. At most they were an annoyance, not a real threat. But Lustron was different. Unlike previous “gamblers” in this “hazardous but fantastically promising field⁴⁰,” Strandlund refused to start small. He promised 400 houses a day to anyone who would loan him \$52 million and a factory⁴¹. To the surprise and outrage of many competitors, he secured today’s equivalent of \$348 million⁴² from the government, and more importantly, secured the government’s vested interest in the company’s success. The

³⁸ *ibid*, p. 2

³⁹ Douglas Knerr, ‘The House America Has Been Waiting For’, (1996), abstract

⁴⁰ ‘Big Capital: Lustron is the only one to raise it, but is it big enough?’, *Architectural Forum*, Vol. 88 (May 1948), p. 10

⁴¹ *Lustron: the house America’s been waiting for*, DVD (2002)

⁴² \$37.5 million (in 1947) is equivalent in buying power to \$348 million today. Lawrence H. Officer and Samuel H. Williamson, ‘Purchasing Power of Money in the United States from 1774 to 2007’, *MeasuringWorth.Com*, 2008

government saw the investment as a way to “jump start” the entire prefab industry⁴³ and thus benefit the broad public. Part of the reason for the government’s support was that it saw industrialized housing technologies as a means of enabling the private sector to serve those missed by the market, and hoped to decrease its direct role in providing housing⁴⁴. Such government assistance was unprecedented⁴⁵, and as a promising, large-scale endeavor, Lustron posed a major threat to the homebuilding industry. People feared it would steal jobs and profits from hundreds of thousands of workers/suppliers, and, at the expense of the government, concentrate all the profits into Strandlund’s pockets. Claiming that the decentralized housing industry was “the last bastion of the spirit of American free enterprise⁴⁶,” many outraged real-estate and building industries viewed this as “creeping socialism,” a government takeover⁴⁷ of the housing industry. Even though Strandlund was successful in befriending and contracting with the unions from the beginning, all of this negative attention made it difficult for him to find dependable workers⁴⁸ for on-site assembly. Worse still, it caused the government—under intense censure and political pressure for its own involvement—to turn on him as quickly as it had embraced him⁴⁹. As one historian later remarked, “out producing the Axis powers...proved an easier task than revolutionizing the entrenched economic, political, and social elements of the American housing system⁵⁰.”

U.S. Steel was a particularly strong opponent of Lustron, and seems to have had its own motives for encouraging the corporation’s demise. In the 1930s, U.S. Steel (among

⁴³ Douglas Knerr, ‘Suburban Steel’, (Columbus 2004), p. 12

⁴⁴ *ibid.*, p. 9

⁴⁵ Douglas Knerr, ‘Lustron: How an Ohio Company’, (April–June 2005), p. 21

⁴⁶ Howard R. Stranger, ‘Suburban Steel: the magnificent failure of the Lustron Corporation, 1945-1951’, *Review, Business History Review* Vol. 78, Iss. 4 (Winter 2004), p. 753

⁴⁷ Douglas Knerr, ‘Lustron: How an Ohio Company’, (April–June 2005), p. 29

⁴⁸ Michelle C. Saxman, ‘An Experiment in Steel’, *South Dakota History*, Vol 36, Iss. 4 (2006), p. 357

⁴⁹ Douglas Knerr, ‘Lustron: How an Ohio Company’, (April–June 2005), p. 31

⁵⁰ Douglas Knerr, historian. Douglas Knerr, ‘Suburban Steel’, (Columbus 2004), p. ix

others) had begun attempts to adapt mass-production techniques that made American car companies so successful to the housing industry. General Electric, Westinghouse, Republic Steel⁵¹, and others had all done the same, yet none were able to achieve what Lustron did. When U.S. Steel saw that Lustron had figured everything out, and had already assembled all the financial support and costly machinery in 1,000,000 s.f. plant, it saw its chance to act. By pressuring the government to discontinue to steel allocations and support to Lustron, the company hoped that Lustron would fail and be foreclosed upon. Then, after Lustron “[went] through the wringer a la Tucker,” U.S. Steel could buy the entire company “at a nice fat loss to the government⁵².”

The Curse of Size, Success, and Government Support: Being so well capitalized and so promising also had its downsides. Had Lustron been a small company, or had it not enjoyed such surprising acceptance, it would not have been consider such a significant threat. After all, prefab housing was not a new idea. However, a prefab operation of this scale was unheard of, and never had such unconventional housing been so widely embraced. Ironically, the fact that the product *was* so successful had a lot to do with the company’s demise. With such an influential presence, no matter what he did, Strandlund was a threat to someone. If his Lustron home succeeded, people feared that he would have a monopoly on the housing industry. Competitors and stakeholders fought aggressively to prevent this. On the other hand, if he failed, he (and the government) would be blamed for wasting millions of public dollars on a fanatical venture⁵³. Either way he was in trouble.

Though initially it may have seemed like a security to have the government on his side, Strandlund’s affiliation with the government proved to be detrimental in the long run. On the positive side, Strandlund was able to get the financing he needed, sums which

⁵¹ Michelle C. Saxman, ‘An Experiment in Steel’, South Dakota History, Vol 36, Iss. 4 (2006), p. 337

⁵² Douglas Knerr, ‘Suburban Steel’, (Columbus 2004), p. 123.

⁵³ *ibid*, p. 166

private investors⁵⁴ would never have gambled on such a risky proposal. The government saw his idea as the solution to the postwar housing crisis and had a significant stake in it, so naturally Strandlund had every reason to feel secure. The government's willingness to provide so much capital to the untested industry separated Lustron from every other prefab housing company, and gave Lustron a real competitive advantage. Yet as time went by, the situation got stickier and corruption became cancerous. Lustron had been struggling financially in its infancy and could not make its loan payments. The RFC had been keeping this a secret. But because Strandlund relied so heavily on the RFC's mercy and continued financial support, he was obliged to keep them happy. This included offering executive positions to several former RFC employees, and payments for positive publicity. As the venture became more and more promising, it attracted more interest from corrupt officials. Certain RFC officials were intent on gaining ownership of Lustron, but Strandlund would not budge. When he refused to contract with a certain company to install only their washing machines in Lustron houses (that would have given an RFC investigator a \$375,000/year kickback), negative publicity began to be circulated⁵⁵. Eventually it was discovered that Lustron was behind on its payments.

This caused quite a stir in Congress. Hearings were conducted, and suspicion was cast on the entire enterprise. Everyone involved was painting as corrupt⁵⁶. The RFC became more concerned with sparing itself the embarrassment and penalty of corruption than with recovering its \$37.5 million investment, and sought to tie off and bury the whole thing⁵⁷. Strandlund went from being viewed as a hero for providing veterans with affordable houses, to being painted as a swindler of government money. Intangible but

⁵⁴ 'The factory-built house is here', *Architectural Forum* Vol. 90 (May 1949), p. 110

⁵⁵ Thomas T. Fetters, 'The History of a Postwar Prefabricated', (Jefferson 2002), p. 111

⁵⁶ Douglas Knerr, 'Lustron: How an Ohio Company', (April-June 2005), p. 28

⁵⁷ Douglas Knerr, 'Suburban Steel', (Columbus 2004), p. 173

ever-powerful forces of doubt and distrust were now circling the once celebrated Lustron Corporation, and the fact that many consumers still embraced it was not enough. As Strandlund continually refused to relinquish ownership but could not make his payment on his loans, the RFC foreclosed, and for pennies on the dollar auctioned away all of Lustron's assets. Sadly, considering all of the mistakes that could have been made, nothing crippled Lustron so much as their "belief that the government would maintain its support until the company outgrew its initial difficulties⁵⁸." The same government that raised them up also ultimately brought them crashing down.

Financial Difficulties: Had Lustron not defaulted on its loans, history might have been very different. But as it were, many things went wrong that caused Lustron to struggle financially.

Lustron began with the expectation of reaching the "mass market" by providing a home wage earners could afford⁵⁹. Strandlund was also specifically targeting veterans, whose "magic number" (based on the average income) for an affordable house in 1946 was \$5,000⁶⁰. Because the immediate postwar housing demand was so great, and because he believed Lustron was the only prefab company large enough to benefit from true economies of scale, Strandlund anticipated great demand for his houses. Surprisingly, the initial market response was even better than expected. The problem was that he could not deliver enough houses on time, and still needed to perfect his production/delivery process. There were also financing complications. Strandlund required payment in full when the house left the factory, but lenders considered the house "chattel property" until it was affixed to a site⁶¹, and would not give pre-construction loans. This necessitated interim

⁵⁸ Douglas Knerr, 'Lustron: How an Ohio Company', (April-June 2005), p. 31

⁵⁹ Douglas Knerr, 'The House America Has Been Waiting For', (1996), abstract

⁶⁰ Douglas Knerr, 'Suburban Steel', (Columbus 2004), p. 94

⁶¹ Douglas Knerr, 'Lustron: How an Ohio Company', (April-June 2005), p. 27

financing, which Strandlund eventually offered. But an even bigger problem was the upfront capital needed for Lustron's franchised dealers. Because Strandlund strictly regulated the profit they could make on each sale, the dealers depended on having a large volume of sales. In order to sell five houses per week, a dealer "would need 20 homes in process, which [required] \$120,000 cash⁶²." When it came to financing, the romantic analogy to Henry Ford's process for delivering cars had serious flaws.

Another commonly cited problem among potential consumers was Lustron's inability to quote an exact finished price, not only nationally but locally. Though the factory sales price was \$6,000, the finished cost (including land, transport, and construction) often ended up between \$10,000 and \$11,000⁶³. Despite what they were designed to be, these were not cheap houses, and were well out of the range of veterans and the bottom third of the market whom Strandlund was targeting. On-site fabrication time varied greatly, and rarely fell within the budgeted 350 man hours⁶⁴. It often took up to 1400 hours to construct a house for the first time (plus 280 factory hours), which was even more than the 1600 hours required to build a conventional house⁶⁵. Only by the time the same crew of builders had constructed their 4th or 5th house did the actual man hours fall within the anticipated limit. By 1949, when Lustron was finally smoothing things out, the postwar housing demand had diminished and an immediate, mass-produced housing solution was no longer necessary.

Except for its promise of speed and affordability, the Lustron home made little sense⁶⁶, and missed the market it was meant to capture. In the meantime, innovative developers such as William Levitt and Sons and Burns-Kaiser were capitalizing on the

⁶² 'The factory-built house is here', *Architectural Forum* Vol. 90 (May 1949), p. 113

⁶³ *ibid*, p. 108

⁶⁴ 'The factory-built house is here', *Architectural Forum* Vol. 90 (May 1949), p. 114

⁶⁵ *ibid*, p. 114

⁶⁶ Douglas Knerr, 'The House America Has Been Waiting For', (1996), abstract

postwar housing demand. Material shortages were no longer a concern, and conventional builders were “ready to undercut [Lustron] at the moment it was most vulnerable⁶⁷.” By employing on-site prefabrication methods for large residential developments, these developers were able to achieve economies of scale and offer traditional stick-built houses for less than Lustron’s steel prefab home. There were other benefits to Levitt’s system as well. Whereas Lustron had to secure financing, find laborers, and fight obsolete building codes and zoning regulations on a sale by sale basis, these large-scale developers did not⁶⁸. Though Lustron did elicit interest from several large-scale developers who proposed developing entire communities of Lustron homes, operations and finances were still problematic. Lustron required a steady demand to stay afloat. It had no warehouse space to store finished houses⁶⁹, and had too great an overhead cost to survive a soft season. Layoffs of workers were endemic. Lustron’s unfortunate dilemma was summarized best in a report by Booz, Allen, and Hamilton: “[Lustron has] produced a house which is in a price class in which there is no real opportunity for large volume; yet the only hope for a profitable enterprise, against this large investment, is a large volume.⁷⁰”

In the end, what can one say about Lustron, or the implications of its failure on the viability of mass-produced, industrialized housing as a solution to affordable housing? Critics can claim that it was doomed to failure by virtue of its unconventional nature, or unrealistic price tag, or because of mistakes made by Strandlund and his team. It is also easy to think that we have better technologies, better designs, and different needs today than 60 years ago. Architects may dismiss Strandlund’s vision as a silly idea for a house, and go on to try their own hand at revolutionizing the housing delivery system in the

⁶⁷ Douglas Knerr, ‘Lustron: How an Ohio Company’, (April–June 2005), p. 27

⁶⁸ Michelle C. Saxman, ‘An Experiment in Steel’, *South Dakota History*, Vol 36, Iss. 4 (2006), p. 357

⁶⁹ Thomas T. Fetters, ‘The History of a Postwar Prefabricated’, (Jefferson 2002), p. 138

⁷⁰ Douglas Knerr, ‘Lustron: How an Ohio Company’, (April–June 2005), p. 38

United States. But whether one believes that the Lustron home was a good piece of architecture or not, the failure of Lustron is somewhat sobering to prefab entrepreneurs. It brings to light many invisible forces preventing innovation and change, and almost begs a few answers. Are impossibilities inherent? Can any revolutionary process design for housing succeed?

What the Lustron failure illustrates are the negative aspects of things often perceived to be good. It is as if for every good, there was an inherent evil. For example, take success and consumer acceptance of the product itself. Lustron was wildly popular. Timing, marketing, demand, brand image—everything was perfect. And yet such success inspired fatal jealousies, which operated to capture and/or destroy the success. Another aspect had to do with government affiliation. Revolutionary ideas often require bending of rules, large-scale changes, and major investments high in risk. In Lustron's case (as with all prefab ventures), private investors would not invest enough to achieve the economies of scale necessary to compete economically with industry norms. Thus Strandlund had no choice but to use government financing. But this put him under the political spotlight, cause enormous murmurings from competitors, and kept him at the mercy of the government. Hence, indirectly, he was at the mercy of the public and its jealousies. Government affiliation was necessary, but lethal at the same time. There are other inherent in industrializing housing—problems in balancing overhead costs (implying small scale operations) with economies of scale (requiring large scale operations); in saving one party money (by providing cheaper houses) by taking money away from someone else (i.e. the producers of housing); in being able to make a significant change without unsettling entrenched interests in the as-is. And yet we never stop dreaming of change.

Bibliography

“Big Capital: Lustron is the only one to raise it, but is it big enough?” Architectural Forum 88 (May 1948): 10-11.

Bryant, Stephen A. “Equity Injunction: Nonconformance of Lustron House to Building Restrictions.” Michigan Law Review 48 (June 1950): 1201-1203.

Ferber, Robert, and Hugh G. Wales. “The Market for Prefabricated Housing.” Journal of Marketing 16.1 (July 1951): 18-28.

Fetters, Thomas T. The Lustron Home : The History of a Postwar Prefabricated Housing Experiment. Jefferson, N.C. : McFarland, 2002.

“First Industrialized House Looks Like a Sure Bet as Lustron Clinches Loan.” Architectural Forum 89 (August 1948): 14.

Hood, Arthur A. “What’s Ahead in Building Material Marketing?” The American Economic Review 39.3 (May 1949): 418-420.

Kahn, Eve M. “Failed Dreams That Paved the Way.” New York Times (22 August 1991): C1.

Kelly, Barbara M. “Suburban steel : the magnificent failure of the Lustron Corporation, 1945-1951” Review. Journal of American History 92.1 (2005-2006): 285-286.

Knack, Ruth Eckdish. “Prefab’s Recurring Promise.” Inland Architect 31 (March 1987): 13, 15.

Knerr, Douglas. "Lustron: How an Ohio Company Almost Changed American Housing." Timeline 22 (April–June 2005): 18–33.

Knerr, Douglas. “‘The House America Has Been Waiting For’: The Lustron Experiment in Factory Made Housing, 1946-1954.” Ph.D. diss., University of Cincinnati, 1996.

Knerr, Douglas. Suburban Steel : the magnificent failure of the Lustron Corporation, 1945-1951. Columbus: Ohio State University Press, 2004.

Lawrence H. Officer and Samuel H. Williamson. "Purchasing Power of Money in the United States from 1774 to 2007", MeasuringWorth.Com, 2008.

“Lustron Asks U.S. Drop Suit, Lend More Money.” Barron's National Business and Financial Weekly 31.2 (8 January 1951): 53.

“Lustron Corporation Develops an Enameled Steel House.” Architectural Forum 86 (June 1947): 105-10.

Lustron: the house America's been waiting for. A co-production of WOSU TV, the Ohio State University, and KDN Videoworks, Inc. DVD. KDN Videoworks, Inc., 2002.

Mitchell, Robert A. “What ever happened to the Lustron Homes?” The Association for Preservation Technology Bulletin 23.2 (1991): 44-53.

Saxman, Michelle C. “The Lustron Home: An Experiment in Steel.” South Dakota History 36.4 (2006): 335-366.

Stranger, Howard R. “Suburban steel : the magnificent failure of the Lustron Corporation, 1945-1951” Review. Business History Review 78.4 (Winter 2004): 753.

“The factory-built house is here, but not the answer to the \$33 million question: How to get it to market?” Architectural Forum 90 (May 1949): 107-14.

“Trend-Setters Housing.” Kiplinger Magazine; the Changing Times 3 (April 1949): 37-39.