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Article Summary: The Lone Oak building, five miles west of Lincoln on U S Highway 6, built in 1944 and occupied in 1945, was constructed with straw bale technology. The two-story building in Lincoln appeared to be the embodiment of modernity using large, fixed, plate glass windows and modernistic design. The selection of the use of walls built of bales of hay was influenced by wartime wood and steel shortages.

### Cataloging Information:

Names: Nola Bailey, Tom Bentley, Joseph McCabe, Josiah M Leeds, William H Orr, William Burritt, Roger L Welsch, Bernard Rudofsky, Carl Schreiner, Tony Caniglia, Joyce Coppinger

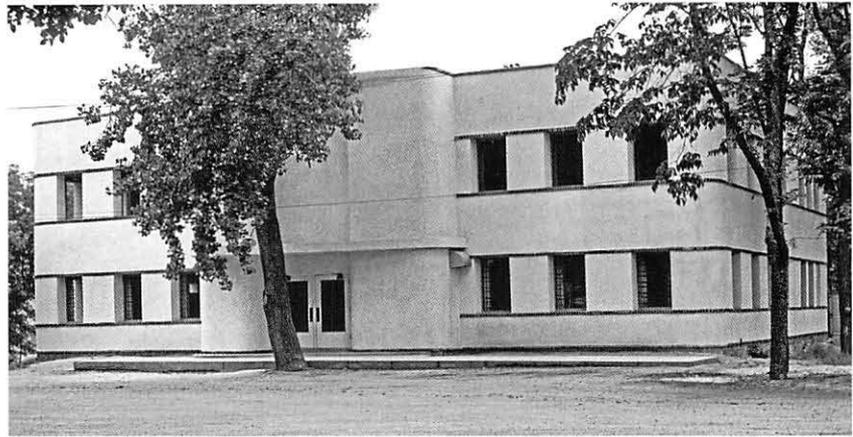
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Photographs / Images: The Lone Oak Building, 1958; The Lone Oak building shortly after completion, 1946; The McGreath house north of Thedford; Bales in the Lone Oak walls showing vertical stacking; the Gardner cottage near Denton; The Lone Oak building at the time the article was written



The Lone Oak's stylish design gives no hint of its hay-bale construction. Here officers and reporters investigate the owners' deaths, Aug. 28, 1958.  
*Courtesy Lincoln Journal Star*



The Lone Oak shortly after completion in 1946. The elm tree near the front door was gone by 1958. NSHS RG2183-1946-0715-7

## THE LONE OAK

# BOLD *and* DARING

BY DAVID MURPHY

*Five miles west of Lincoln on U.S. Highway 6 stands a building that has captured the attention of alternative builders and architects.*

LONG CONSIDERED SOMETHING OF AN ANOMALY, we can see the Lone Oak building now, sixty years after its construction, as a bold and daring venture that segues between an inventive historical phenomenon of the Nebraska landscape and a contemporary international movement—from a native vernacular baled hay building technique to a sophisticated straw bale construction technology.

None of this, we presume, is what the owners had in mind when they undertook construction of their new building in 1945, though it and its owners have achieved a certain notoriety from other perspectives (See *“Tragedy at the Lone Oak,”* p.18). Nola Bailey and Tom Bentley had been in a personal and professional partnership, by all accounts, since at least 1935, and possibly earlier.<sup>1</sup>

SELECTION OF THIS  
UNUSUAL BUILDING  
MATERIAL WAS  
INFLUENCED BY  
WARTIME  
WOOD AND STEEL  
SHORTAGES.



The McCreath house north of Thedford, Nebr. Unlike the Lone Oak, bales in early bale buildings usually were stacked in running bond (each course covers the joints of the course below). Vertical cuts from the baler indicate that the bales are set so the straw is oriented horizontally. NSHS RG1431-81-4

Both worked at the first Lone Oak Restaurant, beginning about 1935 (the year national prohibition was abolished) in the town of Emerald, about six miles west of Lincoln. He was head chef, and she was cashier and floor manager. In 1936 the business moved to a building at the current location, but it burned to the ground in 1944.<sup>2</sup> By July 1945 construction was well under way on the present building, and one year later it was occupied.<sup>3</sup> A lone tree—but not an oak—stood just a few feet from the front entrance.<sup>4</sup>

The handsome two-storey building appeared to be the embodiment of modernity in its use of large, fixed, plate glass windows and its stylistic nod to modernistic design. Beneath the contemporary facade, however, the walls were built of bales of hay.<sup>5</sup> Selection of this unusual building material was influenced by wartime wood and steel shortages.<sup>6</sup>

The idea of using baled “biomass” (the term refers to the essential nature of the material and is used when the actual composition of the bales is not significant) for building blocks was not new to western Nebraskans of the time, though it must have seemed something of an oddity to the eastern urbanites who saw it under construction. Bale-constructed buildings emerged in the North Platte River valley after the appearance of mechanical baling equipment in the latter half of the nineteenth century.<sup>7</sup>

These historical constructions used bales of

prairie hay, and sometimes straw, as giant building blocks, stacked in a running bond similar to masonry construction. The bales were positioned so the hay or straw ran either vertically or horizontally, and they were simply stacked, or set in mud or concrete mortar. Wooden or metal rods typically pinned the bales together, and secured window and doorframes to the wall. Plates were likewise fastened to the tops of walls to provide a solid, level surface on which to set the roof, which usually was of the hipped type, to promote even compression along all four walls and to obviate the need to raise a wall high into a gable end. After a short period of settling—or sometimes an extended period of occupancy—the exterior was fitted with chicken wire, then plastered with clay, lime, or cement stucco. Interior walls were typically lime plastered.

Buildings constructed from bales were extremely economical, with outstanding thermal qualities. Sturdy far beyond expectation, properly built and maintained structures have an indefinite life span. One century-old dwelling, the Burke house, built in 1903 in rural Box Butte County, still stands. Kept dry, the material in baled walls will not deteriorate, and cattle are known to eat hay from old bales.<sup>8</sup> While most Plains bale buildings were built as dwellings, a variety of other functions were also accommodated, including schools, a service garage, and a church.

This technology came to be centered in the Sandhills of Nebraska, where most of the historic-era structures were built, while others appeared on



Bales in the Lone Oak walls, stacked so the straw runs vertically, are laid in stack bond and are separated by wide mortar joints. NSHS RG2183-1945-0730-3

the nearby High Plains of Nebraska, Wyoming, and South Dakota. The major period of bale construction in the west dates from about 1900 to 1935. The two-storey Lone Oak was built ten years after the initial pulse of the technology, and moved it into another realm with its substantial size, two-storey height, and modernistic styling.

The Lone Oak certainly stands as the boldest of Nebraska's historic bale constructions, and is one that significantly pushed the envelope of what had previously been considered possible. Its two-storey height is one of the most daring aspects of its construction. Though decisive evidence is not available, common lore states that its bale walls are load bearing, like those of its native predecessors.<sup>9</sup> Its considerable size, however—approximately fifty-four by seventy-four feet, with a four-thousand-square-foot second story dance hall—raises questions about whether that could be true. Whether it is or not, the building's many idiosyncrasies, including those apparent in the wall construction, are sufficient to assert a discontinuity from the buildings that preceded it (*See "How Did They Do That?" p. 16*). While it appears to be the last of the historic era constructions, there is a sufficient spirit of innovation about it to suggest that the Lone Oak is also among the first of the modern-era constructions.

Other bold aspects of the Lone Oak's construction include the flat concrete roof and the concrete first floor built over a partial basement. Neither of these were part of the native practice. Straw-bale fieldworker Joseph McCabe recorded the first floor construction from the basement in 1994. He described chicken wire stretched between wooden joists, over which was placed a layer of newspapers to function as a base for the poured concrete floor.<sup>10</sup> The second storey dance floor almost certainly was not constructed this way.<sup>11</sup>

Oddly enough, the flat concrete roof was constructed as an "insulated" variation on the first-floor structure. Chicken wire was stretched over the wooden roof joists, but loose hay instead of newspaper was used as the base for the concrete. Such an experiment may have been daring beyond reason, as this part of the assembly has already failed once.<sup>12</sup>

Flat roofs are notoriously difficult if not impossible to maintain, and they require routine monitoring of the membrane to insure against leaks, which could be extremely detrimental to the structural integrity of the Lone Oak's hay walls. Moisture in the bales would lead to mold and eventual rot. As innovative as the construction of

the Lone Oak was, Bailey and Bentley were not entirely alone in their pioneering spirit. The possibilities of a more diverse building technology using baled biomass had become apparent nearly as soon as the native technology first emerged on the Plains. Patents filed by Indiana residents Josiah M. Leeds and William H. Orr, in 1880 and 1885 respectively, suggested using bales as infill in a post-and-beam frame, and using them in a kind of "post-compressed" structural wall that mechanically compressed the bales between a wooden sill and wall plate. Other patents in subsequent years



**Designed and constructed 1996–99 by Carl Schreiner, the Gardner cottage near Denton was the first Nebraska straw bale building to work its way through urban building codes. Its elaborate, heavy, timber frame carries an earthen roof planted with herbs and wildflowers. D. Murphy, DM200210.01-11**

extended the repertoire of possibilities into more exotic structural notions, such as vaulted ceilings constructed of bales, that are just being tested today.<sup>13</sup>

Nothing quite as daring as vaulting was being tried on the ground in the first half of the last century, but other bold experiments were being attempted. Nearly ten years before the Lone Oak was built, William Burritt was building a large, idiosyncratic, two-storey mansion with straw bale infill in Huntsville, Alabama. Burritt's is the first-known application of a post-and-beam system in association with biomass bales. Two years after

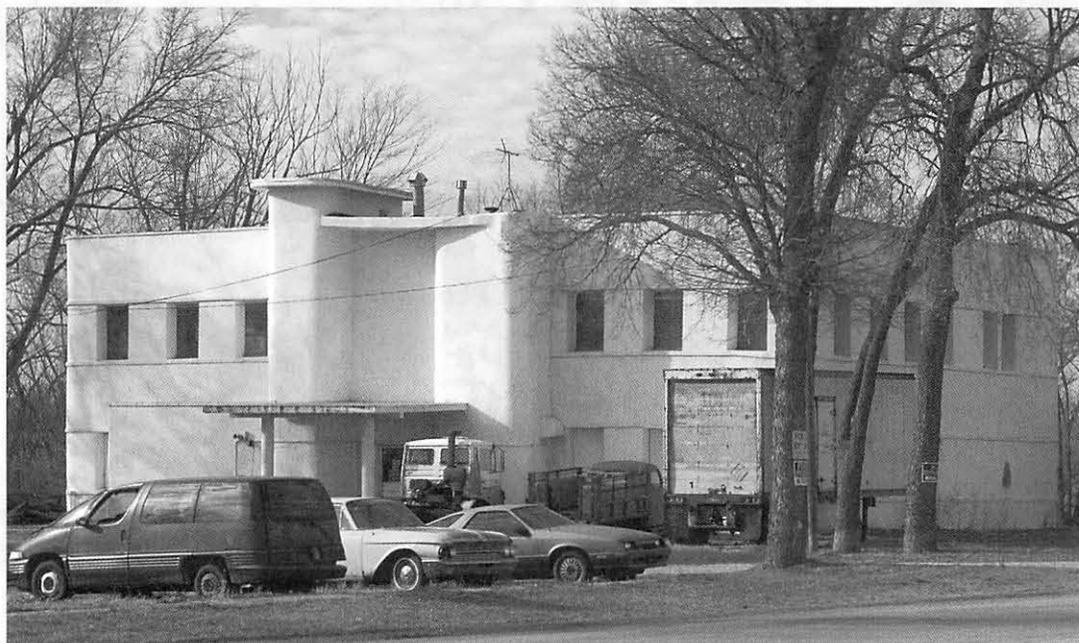
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construction of the Lone Oak, heavily mortared bales were used to construct load-bearing structures in Glendo and Douglas, Wyoming.<sup>14</sup> Whatever the details of these constructions, they, like the Lone Oak, were efforts to push baled buildings beyond their humble beginnings on the Nebraska Plains.

Structural and architectural innovations—some more properly experiments—at the Lone Oak provide a noteworthy segue to contemporary construction. The recent resurgence of bale building in the United States emanated from historical

Nebraska buildings through their own fieldwork. In contrast to the native buildings, the resurgence principally uses oat, wheat, or rye straw—agricultural waste—rather than hay. The construction renaissance was initially centered in the American Southwest—in New Mexico and Arizona—but is now significantly international in scope with buildings all over the American West and in Canada, Mexico, Europe and Asia.<sup>18</sup> Thus, contemporary straw bale construction has already far surpassed historic baled hay constructions in number and distribution, and two-storey structures, now almost all post-and-beam, are no longer uncommon.<sup>19</sup>

Baled biomass construction spread back into the Plains in the 1990s. By mid-decade at least six structures in Nebraska were under way or in planning near Raymond, Lemoyne, Arthur, Spencer, and Denton. The building near Denton, a guest cottage, was the work of local master builder Carl Schreiner, who pioneered the modern technology through the urban building code process.<sup>20</sup> There are now nearly two-dozen new buildings in the state—as many known contemporary constructions as documented historic ones—



The Lone Oak building today. After the deaths of the building's original owners, it continued in use as a restaurant and lounge, first as The Elms and finally as El Ranchito. It was extensively repaired in the 1990s, significantly extending its life, and today is used as a warehouse. D. Murphy, 200601-008

research by regional folklorist Roger L. Welsch, principally from articles that appeared in the 1973 alternative building publication, *Shelter*.<sup>15</sup> Published within an emerging context of natural and energy efficient architectural thought, and following a lead established by Bernard Rudofsky's pioneering book, *Architecture Without Architects*, Welsch's articles first brought baled hay as a viable building technology to a mass audience.<sup>16</sup> This work set off a new era of innovation that used historical ideas as points of departure for new experimentation.

Most contemporary buildings use bales as infill for a wood or steel post-and-beam structure, or as veneering for a stud frame. Structural bale walls, however, dubbed the "Nebraska Style" by revivalist builders, have also enjoyed some renewed popularity.<sup>17</sup> The shift to frame structures was not founded on failures in mass walling so much as on skepticism about its efficacy, a disbelief that prevailed until builders verified the soundness of the

and most are private residences, rural, and owner-built.<sup>21</sup> In addition to structures in Lincoln and Omaha, new urban straw bale buildings include the cabin at the Nebraska Culture & History Learning Center in Gothenburg and the Camp-ground reception shelter in South Sioux City.

Among the most prominent of the new work, and the two largest (both are 6,400 square feet), are Audubon nature center buildings. The first was completed in 2002 at the Rowe Sanctuary near Gibbon. It is a straw bale infill of a wooden post-and-beam frame, and it is also the work of Carl Schreiner. The most recent is at the Spring Creek Prairie Audubon Center south of Denton (2000–2006). It is a steel post-and-beam frame, in-filled primarily with baled prairie flora cut from the tallgrass prairie site.<sup>22</sup> Its master "baler" was Tony Caniglia, an Omaha native now working out of Jefferson, Colorado, who has more than two hundred baled buildings on his resume.<sup>23</sup> Another Nebraskan, Joyce Coppinger, has also been

prominent in promoting the modern renaissance, as founder of the Straw Bale Association of Nebraska in 1998, and since 2003 as the managing editor of *The Last Straw*, an international quarterly journal of straw bale and natural building technologies.<sup>24</sup>

Thus, a unique and interesting chapter of Nebraska's past has returned to inform a living present with great promise in the alternative building industry.

## NOTES

<sup>1</sup> Doc. 201–24, Lancaster County District Court Records.

<sup>2</sup> *Ibid.*; "Brief Seeks Division of Bailey Estate," *Lincoln Star*, Apr. 19, 1960. The newspaper account gives the circa 1933 date; the Lone Oak first appears in Lincoln telephone directories in July 1935.

<sup>3</sup> Construction dates are from the MacDonald Photograph Collection, Nebraska State Historical Society, RG2183–19450730:3, 19450730:4, 19460715:7. See also Lancaster County District Court Records, Doc. 201–24.

<sup>4</sup> Edward F. Zimmer, in personal communication with author, Jan. 5, 2006, attributes the name Lone Oak to a single tree at the site of the original Emerald establishment.

<sup>5</sup> Roger L. Welsch, in personal communication with author, Feb. 6, 2006, remembers being told in oral history interviews that the hay was slough grass.

<sup>6</sup> Edward F. Zimmer, personal communication with author, Jan. 5, 2006.

<sup>7</sup> In addition to Roger L. Welsch, "Sandhill Baled-Hay Construction," *Keystone Folklore Quarterly* 15 (Spring 1970): 16–34, more on the history of baled buildings can be found in Matts Myhrman and Judy Knox, "A Brief History of Hay and Straw as Building Materials," *The Last Straw* 1:4 (Summer 1993): 1, 4–5, 18–19; 2:1 (Fall 1993): 16–17, 19, 23; No. 6 (Spring 1994): 17–18, also [http://www.azstarnet.com/~dcat/SBhistory\(tls\).htm](http://www.azstarnet.com/~dcat/SBhistory(tls).htm) (accessed May 15, 2000); Athena Swentzell Steen, Bill Steen, and David Bainbridge, *The Straw Bale House* (White River Junction, Vermont: Chelsea Green Publishing Company, 1994), 3–19; and David Eisenberg, "Historic Straw-Bale Structures: An Eye-Witness Account," <http://www.skillful-means.com/papers/historic> (accessed July 22, 2001).

<sup>8</sup> See Welsch, "Sandhill Baled-Hay Construction," 27, 31, and Fig. 12. Deterioration of bales will progress primarily from breaches in the protective coatings; those that allow the entry of rodents or, especially, water, will eventually undermine structural integrity.

<sup>9</sup> [Joyce Coppinger], "A Photo Tour of Nebraska's Straw-Bale Buildings," n.d. <http://www.thelaststraw.org/sban/tour/tour.html> (accessed January 5, 2006).

<sup>10</sup> Joe McCabe, "Straw Bale Construction: Emerald, Nebraska, The Landings," Straw Bale Construction Web Information, [http://solstice.crest.org/efficiency/straw\\_insulation/eip/landings.html](http://solstice.crest.org/efficiency/straw_insulation/eip/landings.html) (accessed January 5, 2006).

<sup>11</sup> Roger L. Welsch, in personal communication with author, Feb. 6, 2006, remembers occasioning the Lone Oak as a student in the late 1950s. His recollection of the second storey dance floor was that it "bounced like a trampoline," an observation confirmed in a story related by Joe McCabe, personal communication, February 28, 2006.

<sup>12</sup> Edward F. Zimmer, personal communication with author, Jan. 5, 2006. Zimmer saw the construction during a site inspection leading to local landmark designation (see "Preservation Commission Oks old supper club's restoration," *Lincoln Evening Journal*, Apr. 26, 1990). The construction was clearly visible through a hole that was then present in the roof.

<sup>13</sup> The vaulted bale patent was filed in 1905. So far as is known, none of the patents had influence on the native Plains technology. They were all, in one way or another, propositions for a sophistication that was unnecessary in the Nebraska context and did not appear in documented constructions until the late twentieth century. See Ed Raduazo, "The History of Straw Bale Construction Through Patents," *The Last Straw* 21 (Winter 1998): 23–24; [www.azstarnet.com/~dcat/patents\(tls\).htm](http://www.azstarnet.com/~dcat/patents(tls).htm) (accessed July 30, 2002).

<sup>14</sup> See Steen, Steen, and Bainbridge, *The Straw Bale House*, 6–8.

<sup>15</sup> His scholarly article, "Sandhill Baled-Hay Construction," appeared three years before the popular publication. See Roger L. Welsch, "Baled Hay," two articles by the same title in Lloyd Kahn (ed). *Shelter* (Bollinas, Calif.: Shelter Publications, 1973), 28, 70.

<sup>16</sup> Bernard Rudofsky, *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture* (New York: Doubleday, 1964). For the emergence of straw bale from Welsch's work, see Myhrman and Knox, "A Brief History," and Steen, Steen, and Bainbridge, *The Straw Bale House*, 8–9.

<sup>17</sup> The moniker, I believe, was coined by Myhrman; see his "One Man's Straw Bale Odyssey," *Permaculture Drylands Journal* 10 (Spring 1990): 8–9, 13. For insight into structural research and innovation, see Steen, Steen, and Bainbridge, *The Straw Bale House*; Chris Magwood and Peter Mack, *Straw Bale Building* (Gabriola Island, B.C.: New Society Publishers, 2000); and Matts Myhrman and S.O. MacDonald, *Build It With Bales, Version 2* (Tucson: Out On Bale, 1998).

<sup>18</sup> In fact, they have been constructed all over the world; see the "Strawbale Building Registry," at <http://sbregistry.greenbuilder.com/search.straw> (accessed February 14, 2006). This is a voluntary registry and is not comprehensive, but it suggests the extensive scope of the new construction.

<sup>19</sup> At least one is currently under construction in Nebraska. See also, for example, the Shaw-Cuming house in Vermont, in Doretta Spurduto and Norman McGrath, "House of Straw," *Met Home*, July–Aug., 2000, 72–74.

<sup>20</sup> Carl Schreiner, personal communication with author, Feb. 6, 2006.

<sup>21</sup> Documentation can sometimes be as ephemeral as buildings. Welsch, in "Sandhill Baled-Hay," documented at least sixty buildings in Nebraska, and Myhrman and Knox, in "A Brief History," were able to confirm about thirty of them, of which thirteen were still standing. Neither of these sets of data seems to have survived. So far I have only been able to confirm twenty-two historic buildings, including the Lone Oak, and at present I have twenty-five confirmed or reported new constructions, some of which are retrofits.

<sup>22</sup> A portion of this building is straw bale.

<sup>23</sup> From Caniglia's website, <http://www.strawbaleconstruction.com/main.asp> (accessed February 10, 2006). In personal communication, January 2, 2006, he noted there are more than three hundred buildings in his resume.

<sup>24</sup> Joyce Coppinger, personal communication with author, February 10, 2006. The author acknowledges Coppinger's assistance in finding informants who had opportunity to inspect the Lone Oak building when it was accessible in the 1990s.