

CONSTRUCTION, ADAPTATION, AND PRESERVATION OF EARTH HOMES ON THE
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ABSTRACT

The earth home, in its many varieties and styles, played an important role in the development of the American Great Plains during the mid-nineteenth century. However, the lack of further study into the material culture of these homes has allowed many of these homes to be misrepresented in the historical record as temporary shelters. Not all of the earth homes constructed during this period were temporary. Further study of the materials used, the locations in which they were built, and their construction methods suggest that many of these homes were built to last. The three case studies used in this thesis represent a large number of earth homes still standing today. The findings of this study enhance the history of the region and open up new avenues for further research on earth homes as well as the possibilities and the importance of their preservation.

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LIST OF DEFINITIONS

- Cavity Filled.....a style of earth home where earth is placed within the empty cavity of the wall for insulation and strengthening.
- Dugout.....a style of earth home where a portion of the structure is dug out of the side of a hill.
- Earth Homea term loosely used to describe homes built using raw earth in all or part of the building process.
- Earthlodgea dome-shaped style of home built by native farming peoples of the plains preceding Anglo-Americans.
- Long-House.....a style of earth home common among German-Russians where the home is rectangular in shape and often has an attached area for livestock.
- Milled Lumbermanufactured lumber that is shaped to specific dimensions and kiln dried.
- Material Culturethe physical product created through the interaction between humans and the material world.
- Stick-Frame.....a term used to describe a home built with milled lumber.
- Rammed Eartha style of earth home where earth is compacted to construct the exterior walls using forms.
- Sod Homesa style of earth home constructed with cuts of sod for the exterior walls and/or roof.
- Lean Toa term used to describe a building with a single pitched roof often associated with additions or tar paper shanties.

CHAPTER ONE: INTRODUCTION

“The house form of the Germans from Russia is distinctive, unique and unmistakable; yet like the quiet and humble people who built it, in America it has been misunderstood and ignored.”¹

~William C. Sherman

Great Plains histories covering the latter half of the nineteenth century and well into the twentieth century consistently categorize the earth home as a temporary shelter. In the above excerpt, William C. Sherman, a North Dakota sociologist, educator, and priest, succinctly states that the earth home is a misunderstood and virtually ignored form of vernacular architecture. After four decades, Sherman’s statement remains true. Since the publication of *Russian-German Settlements in the United States* in 1974, Sherman has thoroughly studied German-Russian architecture and has drawn a distinct connection between construction methods used on the plains and those carried over from their homeland. Other types of earth homes have been studied and written about as well; however, the research on earth homes is often overshadowed by social histories, limited to design layouts, or focused more on the ethnic groups than the analysis of the material culture or the builder’s intent. Secondary source information pertaining to the intent of the builder is scant, and what can be found is riddled with biased assumptions, subtle misrepresentations, and outright misinformation. The body of work on earthen vernacular architecture of the Great Plains has suffered from the lack of focused scholarship on the material culture in correlation with the decisions made by the builders to determine intent. Acknowledging those who built these homes as permanent structures should not be

¹William C. Sherman, “Prairie Architecture of the Russian-German Settlers,” in *Russian-German Settlements in the United States*, Richard Sallet, eds. LaVern J. Ripley and Armand Bauer (Fargo: North Dakota Institute of Regional Studies, 1974), 185.

happenstance, but should be based on solid, well rounded research and analysis. This study aims to fill that gap.

This thesis addresses the earth home as a primary source, through the study of its material culture, on three fronts. First, it fills the gaps in the historical literature of the Great Plains by paying special attention to the choices made during the initial settlement and the construction of the original shelter. The second phase reveals a correlation between tradition and adaptation through the construction of outbuildings and upgrades of the initial shelter. Finally, this thesis examines the issues related to the preservation of these vernacular structures in order to continue further study. Drawing upon three case studies in western North Dakota, primary and secondary sources, as well as years of experience in the building trade, it is my contention that many of the earth homes still standing today, whether fully or partially intact, were originally built as permanent homes.² It is my hope that in presenting a clear analysis showing the intent of the builders of the earthen homes in this study, I will create a new perspective, enticing further study of the vernacular structures which are so significant to the development of the northern plains.

The earth home is much more than the simple shelter often alluded to in Great Plains literature. It played a pivotal role in the settlement of the region. The availability of materials and simplicity of construction provided emigrants a quick and inexpensive means of shelter from the harsh weather often associated with the plains. Its thick walls kept the interior cool in the hot summer months and retained heat during the cold winters. Earth homes stood up against high winds, prairie fires, arrows, and the occasional bullet if the need arose.³ The earth home is a testament to a people willing to take a chance on a new life. The way in which it was constructed

²I have spent twelve years as a professional carpenter/general contractor (new construction and remodeling) primarily in residential construction; licensed framer in the state of Colorado and continue to work and consult within the trade part-time.

³Roger L. Welsch, *Sod Walls: The Story of the Nebraska Sod House* (Broken Bow, NE: Purcells, Inc., 1968), 24-25.

tells us of the builder's determination and tenacity for success. During the latter half of the nineteenth century and well in to the twentieth century, with the aid of the Homestead Act of 1862, the construction of earth homes flourished on the Great Plains. Everett Dick, historian and authority on the West, describes this period in the title of one of his books as *The Sod-House Frontier*.⁴

The historiography of the Great Plains is scattered with works through which agency is given to ethnic groups and genders, emphasizing the styles of homes as well as specific regions of the plains, but only in part. William C. Sherman, Richard Sallet, and Warren A Henke all thoroughly examine ethnic groups on the northern plains.⁵ Further, Glenda Riley, H. Elaine Lindgren, and Marcia Meredith Hensley fill the void in plains histories by addressing women's impact on the region through their own land claims and written accounts.⁶ Great Plains histories written by authors like Walter Prescott Webb, Everett Dick, and Elwyn B. Robinson present a broad overview of life during the early development of the plains.⁷

With the exception of Sherman's work, many of these scholarly studies overlook the importance of the earth home on the plains beyond its use as a temporary shelter. Many of the above works describe floor plans, display photos of settlers next to their homes, and go into minor details about building methods and styles. Focus is given to the homes themselves through

⁴Everett Dick, *The Sod House Frontier, 1854-1890: A Social History of the Northern Plains from the Creation of Kansas & Nebraska to the Admission of the Dakotas* (Lincoln: University of Nebraska Press, 1937).

⁵William C. Sherman, *Prairie Mosaic: An Ethnic Atlas of Rural North Dakota* (Fargo: North Dakota Institute of Regional Studies, 1983); Richard Sallet, *Russian-German Settlements in the United States*, trans. Lavern J Ripley and Armand Bauer (Fargo: North Dakota Institute for Regional Studies, 1974); Warren A. Henke, Timothy Klobberdanz, Theodore P. Pedeliski, and Robert P. Wilkins, *Plains Folk: North Dakota's ethnic History*, ed. William C. Sherman and Playford Thorson (Fargo: North Dakota Institute for Regional Studies, 1988).

⁶Glenda Riley, *The Female Frontier: A Comparative View of Women on the Prairie and the Plains* (Lawrence: University Press of Kansas, 1988); H. Elaine Lindgren, *Land in Her Own Name: Women as Homesteaders in North Dakota* (Fargo: North Dakota Institute of Regional Studies, 1991); Marcia Meredith Hensley, *Staking Her Claim: Women Homesteading the West* (Glendo, WY: High Plains Press, 2008).

⁷Walter Prescott Webb, *The Great Plains* (New York: NY: Gosset & Dunlap, 1931); Everett Dick, *The Sod House Frontier, 1854-1890: A Social History of the Northern Plains from the Creation of Kansas & Nebraska to the Admission of the Dakotas* (Lincoln: University of Nebraska Press, 1966).

cultural resource surveys, which provide detailed information regarding location, style, and materials used in their construction but fall short in discussing methods and intent. Tom Isern, Lotte Isern, and Tricia Velure prepared the survey, *Historic Architectural Survey of Bowman County*, which identified potential historic districts as well as individual structures and themes throughout the county.⁸ Other surveys provide a more in-depth approach, describing background on the ethnic groups associated with the structures under study, consisting of descriptive identifications and detailed categorization of building styles and their locations. Lon Johnson, Mark Hufstetler, and Alice Emerson prepared a survey titled, *Ethnic Architecture of Stark County, North Dakota*.⁹ In the survey, they identify the styles of buildings and their locations, and they associate each style with an ethnic group. They present detailed examples of materials used while recognizing the similarities of traditions carried over. By design, cultural resource surveys are not meant to analyze the construction methods of buildings; their intentions are to categorize and identify possible significant resources within the survey area.

Early histories of the Great Plains often reflect a period when exploration and independence belonged to men. Everett Dick states, “Although it was bad enough for a man to live in a dugout, it was far more trying on the women.”¹⁰ Walter Prescott Webb recounts O. E. Rølvaag’s work by concluding, “Men have loved the Plains with a primitive simplicity; women have been repelled from them as from a mysterious and dangerous world.”¹¹ Ironically, most of the negative accounts of living in an earth home on the plains come from men. Marcia Meredith Hensley collected numerous primary and secondary accounts of independent women

⁸Tom Isern, Lotte Isern, and Tricia Velure, *Historic Architectural Survey of Bowman County* (Fargo: North Dakota Institute for Regional Studies, 1998).

⁹Lon Johnson, Mark Hufstetler, Alice Emerson, *Ethnic Architecture of Stark County, North Dakota* (Bismarck: State historical Society of north Dakota, 1992).

¹⁰Everett Dick, *The Sod House Frontier, 1854-1890*, 111.

¹¹Walter Prescott Webb, *The Great Plains*, 474.

homesteaders who displayed optimism and a shared a grateful attitude toward their earth homes.¹² Barbara Handy-Marchello also argues the merit of the earth home by stating, “For all its notoriety the sod house offered comforts in Dakota Territory that uninsulated board houses could not, even under the command of the most conscientious housekeeper.”¹³ H. Elaine Lindgren adds that the “pioneer women used their ingenuity to create a home that was both appropriately domestic and expressively individual.”¹⁴ Even with this information at hand the earth structure remained as a backdrop to the social histories of the plains.

Dick titled his book *The Sod House Frontier*, and yet, of the 516 pages, just seven are dedicated to the earth house.¹⁵ Elwyn Robinson spends only a little more than two pages of his 592-page work, *History of North Dakota*, on early pioneer shelters.¹⁶ Webb, a historian and environmental determinist, completely ignores the northern plains and earth homes in *The Great Plains*. Webb’s dismissal of earth homes is fascinating considering how well they could be applied to his thesis of adaptation to environment.

Within these short descriptions of the earth home there is often a suggestion that these homes were built as temporary shelters, referring to the fact that many of these settlers were not familiar with these building techniques. Statements such as “many families did live in them until something better could be provided” riddle the historiography of the plains.¹⁷ Carl Frederick Kraenzel, a sociologist who was born in Hebron, North Dakota, states that “the important thing is that people had to learn to live in sod houses and dugouts for a time at least,” suggesting that

¹²Marcia Meredith Hensley, *Staking Her Claim: Women Homesteading the West*, 2008.

¹³Barbara Handy-Marchello, *Women of the Northern Plains: Gender & Settlement on the Homestead Frontier, 1870-1930*, (St. Paul: Minnesota Historical Society Press, 2005), 59.

¹⁴H. Elaine Lindgren, *Land in Her Own Name*, 84.

¹⁵Everett Dick, 110-117.

¹⁶Elwyn B. Robinson, *History of North Dakota*, (Lincoln: University of Nebraska Press, 1966), 159-161.

¹⁷Everett Dick, *Conquering the American Desert: Nebraska*, (Vol. XXVII Lincoln: Nebraska State Historical Society, 1975), 27.

emigrants know nothing of the earth home prior to settling the plains.¹⁸ Kraenzel does recognize that the plastering of walls aided in the reduction of bed bugs, yet goes on to assert that the dirt floor did nothing to help the “Kansas itch.”¹⁹ Kraenzel writes with a tone of sarcasm and high-brow wit when describing the living conditions within the earth home, adding to the stigma often found within other scholarly writings on the Great Plains during this era.

Despite the negative connotations and the idea that these homes were built as temporary shelters, some scholars have devoted time and research into the construction methods and styles of the earth home. Folklorist Roger L. Welsch wrote one of the earliest works on the sod house. *Sod Walls: The Story of the Nebraska Sod House* goes into great detail about the construction methods and materials used when building a sod home.²⁰ Welsch uses photographs taken by Solomon D. Butcher to illustrate the materials used, the construction methods, and the many different styles of sod homes.²¹ Welsch narrows his focus of earth homes strictly to the sod house and to the state of Nebraska. Butcher’s photographs identify many of his subjects, but instead of drawing on the correlation between building methods and ethnic traditions, Welsch argues that the sod home is purely an American tradition.²²

Ronna Lee Widner takes the study of the sod home one step further in her master’s thesis, “Sod Houses of Rawlins County, Kansas.”²³ Widner chose five case studies of existing sod homes constructed by Czech settlers differing from the classic styles of sod homes found in the historiography of the plains, expanding the research of building styles and the use of sod. Widner’s thesis is one of the few works to reveal the adaptive methods of the building styles

¹⁸Carl Frederick Kraenzel, *The Great Plains in Transition* (Norman: University of Oklahoma Press, 1955), 134.

¹⁹Ibid., 134.

²⁰Welsch, *Sod Walls*, 1968.

²¹John Carter, *Solomon D. Butcher: Photographing the American Dream* (Lincoln: University of Nebraska Press, 1985).

²²Welsch, 1968.

²³Ronna Lee Widner, “Sod Houses of Rawlins County, Kansas” (master’s thesis, George Washington University, 1988).

through additions to the homes and their use. Widner argues that the sod home was a practical and permanent form of construction on the plains.

Molly Patrick Rozum adds to the idea of questioning the traditional construction of the sod house in her master's thesis, "'It's Weathered Many a Storm -- Many a Wind Storm': The Sod House in Northwestern South Dakota, 1900 to 1990."²⁴ Rozum addresses the styles of sod homes and the meaning of sod itself in regional culture through the actions of three families, all settling at different times and located at different distances to availability of manufactured materials. Both Widner and Rozum stay within the social dynamics of the settlers who constructed their homes of sod. Variants in styles of homes and differentiating between permanence and impermanence are key factors in both works. Both Widner and Rozum tie the social histories, to the use and style of the sod home, making the connection between the home and the builder.

It is interesting that much of the research on earth homes has been done by geologists, folklorists, historians, and sociologists. One would assume that the majority of research on these vernacular structures would have been done by architectural historians. Looking through the architectural library, little could be found on earth structures during this period, but more modern forms of earth homes are accounted for. Dell Upton, a well published architectural historian, edits the work titled, *America's Architectural Roots*, where sections of the work are dedicated to earth structures, their styles, and those who built them.²⁵ However, Upton sums up the reason

²⁴Molly Patrick Rozum, "'It's Weathered Many a Storm -- Many a Wind Storm': The Sod house in Northwestern South Dakota, 1900 to 1990" (master's thesis, University of North Carolina, 1993).

²⁵Dell Upton, ed., *America's Architectural Roots: Ethnic Groups that Built America* (New York: John Wiley & Sons, Inc., 1986).

those familiar with building in this type of landscape constructed these was because “that was all they knew.”²⁶

Architects are professional designers who tend to look toward the future, using the latest advances in technology and applying them toward unique designs to suit the client. Vernacular architecture, or folk traditional building, limits the architect’s designs to a specific tradition or style, whereas modern architects can draw inspiration from many forms.²⁷ Architectural historians, however, usually fall into the same category as other academics where the earth home tends to be overshadowed by more sophisticated building styles. Steve C. Martins and Ronald H. L. M. Ramsay, both well published professors at North Dakota State University and authors of a recent book, *Buildings of North Dakota*, recognize popular earthen vernacular traditions such as the Ukrainian and German-Russian styles but minimize other archetypes.²⁸ It seems that architects generally see earth homes, specifically those built of sod, in the same manner as Walter Webb might have seen it, as a product of environmental determination.

Other possible reasons for the neglect of further study of earth homes may lie within the location of the homes. Robinson discusses six themes that have affected the development of North Dakota, one of which is “remoteness.”²⁹ This could explain the lack of further studies among many of these published works on the earth home. Earth homes are often found miles outside of even the smallest towns. Many of the towns these earth homes were remotely close to have nothing left but the skeletal remains of the buildings that were once there. Another reason could be due to the consistency within the literature that these homes were temporary;

²⁶Ibid, 9.

²⁷Thomas Hubka, “Just Folks Designing: Vernacular Designers and the Generation of Form,” in *Common Places: Readings in American Vernacular Architecture*, eds. Dell Upton and John Michael Vlach (Athens: University of Georgia Press, 1986), 426-432.

²⁸Steve C. Martins and Ronald H.L.M. Ramsay, *Buildings of North Dakota* (Charlottesville: University of Virginia Press, 2015).

²⁹Robinson, *History of North Dakota*, 1966.

reinforcing the idea that further research is not required. Or it could be that many scholars assume that there is simply nothing left to study; the homes have all but eroded back into the earth.

Another theme suggested by Robinson, “economic disadvantage,” may also apply to the slighting of the earth home.³⁰ Of course, Robinson was referring to the entire state of North Dakota; however, one could assume it would make matters worse being in an isolated area within the state. It is no mystery that many earth homes were built out of necessity due to the builder’s economic status, the location of the home, and the availability of materials. These conditions may have limited the builder’s options as to what materials to use in order to construct a home, but they do not take away from their intentions. The material is simply that, material. Many factors beyond the material are used to determine intent. Those unfamiliar with building in this type of landscape could have gained knowledge of construction methods from experienced builders in the community or simply through examples of those who have already settled.

What if there is a much deeper issue at work here, one that is subconsciously related to the earth home being overlooked? Possibly a deeper, engrained psychological issue directly associated with the terminology and the materials used to construct these homes. The word *earth* is directly associated with *dirt*, but *earth* does not carry the same implications. The Oxford English Dictionary describes the etymology of the word *dirt* as a “metathesis of Middle English . . . Old Norse *drit*, neuter, excrement.”³¹ An earlier form of the word came from the “Germanic

³⁰Ibid.

³¹Oxford English Dictionary, “dirt,” last modified October 2, 2014, accessed via North Dakota State University Library May 15, 2017. <http://www.oed.com.ezproxy.lib.ndsu.nodak.edu/view/Entry/57785#eid6004131>.

strong verb . . . *dritan*,” or “*drite*, meaning to void or drop excrement; to stool.”³² The word itself derived from a direct association with waste.

In her book *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*, Mary Douglas, a renowned anthropologist, studies the cultural construction of what is clean and dirty in relation to secular, religious, and primitive life. Douglas argues that “[d]irt offends against order. Eliminating it is not a negative movement, but a positive effort to organize the environment.”³³ Valerie J. Curtis, a hygiene specialist, takes it one step further by suggesting that our association with disgust is innate, and over time, culturally constructed.³⁴ Curtis deduces that “prehistoric man would have behaved hygienically. He would have groomed himself to remove parasites and kept his living areas free of humid wastes that can [harbor] them. He would have [defecated] away from his shelter and avoided close contact with the bodily fluids of others.”³⁵ Joseph A. Amato takes dirt to a microscopic level in his book *Dust: A History of the Small and the Invisible*.³⁶ Amato examines the human experience with dust beginning in ancient times, when its extent only existed through what could be seen by the naked eye, to the entirely new world that was discovered with the invention of the microscope. He posits that dust is of all things, not just of the earth. Dust also resides at a microscopic level, leaving humans understanding of it at the mercy of those who study it in its smallest forms. Even though they may look clean to the naked eye, we wash our hands, and clothes, and vacuum our carpets to rid

³²Oxford English Dictionary, “drite,” last modified October 2, 2014, accessed via North Dakota State University Library May 15, 2017. <http://www.oed.com.ezproxy.lib.ndsu.nodak.edu/view/Entry/57785#eid6004131>.

³³Mary Douglas, *Purity and Danger: An Analysis of Concept of Pollution and Taboo*, Routledge Classics, v 2 (London: Routledge, 2003), 2.

³⁴Valerie J. Curtis, “Dirt, Disgust, and Disease: A Natural History of Hygiene,” *Journal of Epidemiology Community Health* 61, no. 8 (August 2007): 660-664.

³⁵*Ibid.*, 661-662.

³⁶Joseph A. Amato, *Dust: A History of the Small and the Invisible* (Los Angeles: University of California Press, 2000).

them of disease-carrying dust particles. Amato's work confirms that our discriminant nature toward dirt goes far beyond what the eye can see.

There is no argument that our association with dirt has developed into a direct correlation with disease and hygiene. People rid their homes of dirt, in the general sense, to stave off bugs and disease. The laundry room, also known as the mud room, became a commonplace among homebuilders, acting as a clean room where muddy boots and dirty clothes could be removed prior to entering the living quarters. Many religions bury their dead into the earth, yet caskets protect them from direct contact with dirt. And yet, if dirt is manipulated by nature or humans to the point of no longer resembling what is swept up in the mud room, it is suddenly acceptable.

Generally speaking, when dirt is mixed with specific ingredients, shaped to produce a man-made object, and applied to a building project it instantly becomes a more sophisticated form of construction. Martins and Ramsey state, "Eastern Europeans and immigrants from the arid steppes of Russia plied a wide variety of mass wall and earthen-roofed buildings that far exceed basic sod house technology in terms of design sophistication and resource efficiency."³⁷ This statement not only represents the common thread associated with the earth home in the historiography, but also suggests that sod construction was too simplified to warrant further study. Stone, rammed earth, cavity-filled, and hand-made bricks are acceptable due to their use and the need to shape them into a specific form. The irony is that all of these forms included some amount of manure to act as a bonding agent. And in the case of the sod home, builders spent ample time cutting, setting, and shaping the sod in the very same manner as one would build a home with bricks. If perception of a product is the key to its stature, then a final coat of plaster on both the interior and exterior of the home should eliminate any bias.

³⁷Martins and Ramsey, *Buildings of North Dakota*, 5.

With these beliefs, combined with the American industrial revolution, social statuses, and humankind's desire to tame the wild, make it no wonder that the earth home is seen as a primitive building style. These beliefs suggest, whether subconsciously or intentionally, why assumptions and overshadowing exists in the historical literature when it comes to the earth home. They may also be what is hindering further studies in the preservation of these vernacular structures.

Information regarding the preservation of earth homes during this period is simply nowhere to be found. A handful of websites dedicated to the sod home, or earth homes in general, on the plains give basic instructions on how to build one of these structures; however, most of the sites are geared toward the construction and design of earth building using modern technologies. There are a few examples of family members who have attempted to restore a home that still resides on their land, investing their own money and time into preserving their family history. Even if there were an interest in the preservation of these homes, their location and the labor needed would hinder most attempts to do so. Their high maintenance and susceptibility to the elements, which can be extreme in the plains region, would require the incorporation of modern technologies to sustain the life of the building with limited interaction. But where does the preservationist stop the use of these technologies in order to maintain the integrity of the structure's history? It does not take a lot of explaining before one understands the challenges facing the preservation of an original earth home.

The research conducted for this thesis derives primarily through on-site field studies of earth homes in western North Dakota since 2009. This thesis will focus on three case studies that will be used as base examples. The case studies have been specifically chosen because they display three individual and unique uses of earth in their methods of construction. Each home

represents a larger number of similar homes within the northern plains. Further support will come from primary and secondary sources, interviews, oral histories, and photographs, as well as the author's twelve years of experience in residential construction. The methodology will be based on two renowned award winning authors: Henry Glassie and Alan G. Noble. Glassie is a folklorist in material culture and vernacular architecture whose approach to the study of vernacular architecture in his book *Material Culture* looks at the material culture and the construction methods, combined with social histories and traditions, to determine the intent of the builder.³⁸ Noble is a geographer who studied the evolution of farm barns in his work, *Wood, Brick, and Stone: The North American Landscape*.³⁹ Both authors are cited in many of the works researched for this thesis written by architects, architectural historians, and archaeologists.

Glassie spent over a decade researching buildings along the section of the Great Smoky Mountains to the Allegheny Mountains from Tennessee to Virginia.⁴⁰ His research led to a more specific focus of log homes in southwestern Pennsylvania where he questions the authority of the builder and the reasons behind their methods.⁴¹ Glassie's study examines the material culture of the log homes through the methods by which they were constructed. In his study Glassie explains that "[t]he building – whether a house of one room or an enormous, soaring barn – spoke clearly of a collaboration between master of the trade and a gathering of willing amateurs."⁴² What Glassie is referring to is the builders' skill level that is often revealed through the craftsmanship of the construction. The methods by which these logs homes were constructed also exposed clues as to the builders' origin and intent. Glassie used this method of reading the material culture not

³⁸Henry Glassie, *Material Culture* (Bloomington: Indiana University Press, 1999).

³⁹Allen G. Noble, *Wood, Brick, and Stone: The North American Settlement Landscape* Vol. 2. "Barns and Farm Structures" (Amherst: University of Massachusetts Press, 1984).

⁴⁰Henry Glassie, *Material Culture* (Bloomington: Indiana University Press, 1999), 231.

⁴¹Henry Glassie, "The Types of Southern Mountain Cabin," appendix in *A Study of American Folklore: An Introduction*, Jan Harold Brunvand (New York: W.W. Norton & Company, 1968), 338-370.

⁴²Glassie, *Material Culture*, 247.

only to determine the skill of the builder but also to reveal changes in how builders perceived their version of a proper home. He recognized not only the individual's perception but also how the individual adapted to surroundings, be they cultural, functional, economical, traditional, or otherwise.⁴³

When applying Glassie's technique to earth structures, a slightly different approach must be taken, specifically when it comes to defining what it means to be the master of the trade and the willing amateur. The term *master of the trade* refers to an individual with a specific skillset, such as hewing logs or laying stone. A master's work can be easily identified within their realm of expertise. However, an individual may excel at one or two skills and yet be an amateur in another, suggesting that Glassie's identification of masters and amateurs could be the same individuals. This identification may seem trivial, but when it comes to identifying the intent of those constructing earth homes, the environment, available materials, location, and the economic status of the builder will be taken into consideration.

Alan G. Noble identifies the evolutionary traits associated with building farm barns in the northwestern United States.⁴⁴ Noble identifies the ethnic groups associated with building styles as well as how they adapted over time to accommodate societal and cultural changes. Much like William C. Sherman's work with ethnic groups, Noble maps out distinctive styles and the regions these structures were most prominent in. Noble studied thousands of farm structures including barns, small outbuildings, and fences in order to reveal these changes.⁴⁵ Noble's approach to the study of farm structures reveals that adaptation is not primarily due to the environment, as Webb would argue; it can be a result of the economic status of the builder, the

⁴³Ibid; 227-354., Glassie, "Types of Southern Mountain Cabin," 338-370., Henry Glassie, *Pattern in Material Folk Culture of the Eastern United States* (Philadelphia: University of Pennsylvania Press, 1968).

⁴⁴Allen G. Noble, *Wood, Brick, and Stone: The North American Settlement Landscape* Vol. 2. "Barns and Farm Structures" (Amherst: University of Massachusetts Press, 1984).

⁴⁵Ibid.

location of the structure, the needs of those utilizing the structure, and the experience of the builders.⁴⁶ With the exception of his study on bake ovens and fencing, Noble's work applies directly to structures built with engineered lumber. The skillset of the builder does not necessarily come into play as much as it does with Glassie's work where trees were felled, hewed, and cut to fit. It is the style of home and the methods by which the milled lumber is utilized in the building process that distinguishes the builder's experience. The use of manufactured materials does not take away from the skills of those constructing these structures; it simply defines a completely different environment in which materials and labor were more accessible.

The limitations of this study lie within the very sources used to support it, which limit some of the data, requiring a theoretical approach. Plaster and mortar samples taken from the three case studies only reveal percentages of the ingredients, leaving specific recipes open for interpretation.⁴⁷ Surveys only include existing homes or the remains of homes, and records do not show rental properties after the homestead was claimed. Due to their susceptibility to the elements many of the earth homes listed in homesteading records have long eroded back into the earth or have been leveled by livestock or cultivation. This susceptibility supports my contention that the earth homes still standing today were built as permanent structures.

Whether it is because of socially constructed ideas, or the notion that this style of building is simply beneath us, the earth home has been overshadowed by social histories and simplified to the point of exclusion. The belief that these homes were built as temporary shelters overwhelms the historiography of the Great Plains, without regard to the many examples that suggest otherwise. The following three case studies - the Hutmacher, Gregory, and Ruud homes -

⁴⁶Ibid.

⁴⁷Larry Swenson, North Dakota State University Soil Testing lab (Fargo, ND) October 4, 2016.

are examples of those who constructed these earth homes with intent. They express the tradition, adaptation, and the resourcefulness of those who constructed them. The buildings speak through their materials via the saw marks, the placement of walls, the aging of lumber, and the methods of application. The information gathered through the study of the material culture of the earth home, coupled with the experiences of those who resided and interacted with them, can lead to a better understanding of those who settled the plains and hopefully create a dialogue on realistic approaches to their preservation.

CHAPTER TWO: TAKING ROOT ON THE NORTHERN PLAINS

“...the study of vernacular architecture is an approach to the whole of the built world. It favors completeness, recognizes diversity, and seeks ways to use buildings as evidence in order to tell better versions of the human story.”¹

~Henry Glassie

The Homestead Act of 1862, signed into law by President Lincoln, opened up thousands of acres of public land. This land law legally opened the Dakota Territory for settlement.² The Homestead Act of 1862 allowed immigrants, single women, freed black slaves, and anyone who had never held arms against the United States to take part; it was the catalyst to the development of the northern plains. Land laws that followed, such as the Timber Culture Act of 1873, the Desert Land Act of 1877, coupled with the amended Preemption Act, were to provide other opportunities for settlement aside from cultivation, to relax the land system for those trying to build homesteads in the arid and semi-arid regions of the West, and to allow those seeking larger amounts of acreage to add on to existing homesteads.³ Between North and South Dakota, from 1868 to 1904, these land acts dispersed 25,415,910 acres of land under 164,999 land entries.⁴

The diversity that these land acts created was reflected through newspapers, religions, and communities throughout the plains. However, the most distinct and prominent features resulting from these acts were the vernacular structures that rose among the prairie grasses. Most notable were not the stick-framed structures, resonating with man’s conquest of the wild, but rather the buildings constructed of earth that revealed more of an agreement between the two, the adaptation of humans and a willing accommodation from nature. These structures flourished in the landscape of the plains from the late 1800s to the early 1900s, accommodating all, regardless

¹Henry Glassie, *Material Culture* (Bloomington: Indiana University Press, 1999), 231.

²Paul W. Gates, *History of Public Land Law Development* (Washington, D.C.: U.S. Government Printing Office, 1968), 408.

³*Ibid.*, 399-401.

⁴*Ibid.*, 493.

of sex, color, or creed, echoing the skills of their creators, and more distinctly, their intentions. The historiography of the Great Plains overwhelmingly characterizes these earth structures as temporary shelters; however, a deeper study of their material culture suggests that many of these homes were constructed with permanence in mind.

Within the Great Plains early settlers sought shelter under wagons, dug holes and covered them with canvas or sheets, or constructed a dugout until a more substantial shelter could be built.⁵ Access to lumber was subject to the settler's economic status, proximity to available lumber, and the railroad. Within the plains environment a different kind of skillset overshadowed those of the master, one that incorporated ingenuity with practicality and ensured the survival of those seeking to make the Great Plains their home.

Becoming a master of a trade required time and consistency to develop; time that pioneers of the plains had little of. Initially their need for self-preservation preceded considerations of style and design, which would only come once a sense of security was established. A better term for those building earth structures in these isolated locations is *jack of all trades*, often used in the derogatory as, *jack of all trades, master of none*. However, this saying could not be farther from the truth. A jack of all trades may lack the speed and specific skills of the master, but excels in adaptation. He possesses the mechanical aptitude to incorporate the materials available while interjecting a perception of a proper home. The initial success or failure of those seeking to stay long enough to prove up their claims depended on their character, their resolve, and how well they prepared for life on the plains.

Early settlers claimed the plots closer to railways and access to milled lumber. In later years these claims no longer existed. The remaining claims were miles from these sources, and they required settlers to pick locations where available lumber could naturally be found or to

⁵Dick, 110; Robinson, 159.

acquire some from friends or family who were already experienced with life on the plains. Building a shelter was the first and most urgent action that needed to be taken. Robinson states that a log cabin of two rooms would be built if settlers were near a wooded river bank.⁶ If no lumber was available, a dugout would be constructed in the side of a coulee bank, and if they were on the open prairie they might build a sod house.⁷ If they had access to a limited supply of lumber or could only afford a small amount, they might construct a wood shanty and cover it in tar paper, “often putting sod outside the board walls for greater warmth.”⁸

Opportunities to learn these basic building skills and about life on the plains were at every corner. Wagon trains, steamers, and ships crossing the vast oceans were full of people taking advantage of these new lands. Places like the Old Courthouse in St. Louis, Missouri, served as meeting places where pioneers could plan and exchange information with likeminded people making their way westward.⁹ These situations allowed ample time for interaction and preparation. Organizations like the New England Emigrant Aid Company escorted friends, family, and neighbors to the plains where “they would enjoy each other’s society and help in the new country.”¹⁰ Folklorist Roger Welsch posits that “[t]he man who could live in a covered wagon with his wife for a month while he found a good site, selected the best sod, and carefully raised his walls was likely to have a finer finished product than the man who stepped off the train with a wife, four children, and a bag of carpentry tools.”¹¹ It was these latter individuals who often built the temporary earth shelters that led to the negative connotations in the historiography of the plains.

⁶Robinson, 159.

⁷Ibid.

⁸Ibid.

⁹Norman Tyler, Ted J. Ligibel, and Ilene R. Tyler, *Historic Preservation: An Introduction to its History, Principles, and Practice*, second edition (New York: W. W. Norton & Company, 2009), 221.

¹⁰Dick, 15.

¹¹Welsch, 28.

Temporary structures existed within all types, regardless of materials or methods. H. Elaine Lindgren recalls a description from Cora Barnfather Maglasson of her first shelter when she arrived on the plains during the winter months...

A man nearby had a sawmill. We said I should sleep on the land that night. He dug up some green cotton-wood boards from under the snow and built a 6 x 10 foot shack right on his bobsled. In the afternoon we went up to my land, cleared the snow from a little spot and set the shack on bare ground, tar-papered it and I moved in and got the helpers lunch.¹²

Within the category of earthen structures there are specific styles that were more commonly built as temporary shelters during this period. Shelters previously described by Robinson, such as the dugout or the tar paper shack surrounded by sod walls for better warmth, were ideal for those individuals inexperienced with earth building. The more substantial homes built for temporary means were those constructed of sod. These temporary structures were often where the stories of bug infestations, leaking or collapsing roofs, and overall horrible living conditions came from. The sod home has taken the brunt of the blame for the undesirable living conditions associated with it, when in fact the blame should be placed on the builders, their haste in construction, and their inexperience. Glassie would refer to these builders as the amateurs – those who came to the plains unprepared or simply lacking the skills required to build a structure using available resources.

The three case studies used in this thesis provide examples of permanent earth construction through their choice of location, method of construction, and skill of the builder. The ethnic groups represented are the Ukrainians, German-Russians, and Norwegians, each of whom displayed different building methods. The Ukrainian and German-Russian case studies represent builders who were familiar with building in this type of landscape. They addressed community, family, and tradition within their building styles and locations. The Norwegian case

¹²H. Elaine Lindgren, *Land in Her Own Name*, 83.

study reveals more of an adaptive/individual approach to building on the plains, a temporary structure turned permanent.

George Gregory and his wife Wasylina (Angeline) arrived at the port of Winnipeg in the spring of 1906.¹³ By the spring of the following year George and Angeline had made it to Belfield, North Dakota, where George filed his intent to homestead during the peak of Ukrainian settlement in the western part of the state.¹⁴ Final proof was made in 1913, and George and Angeline continued to farm the land and raise seven children.¹⁵ After George Gregory died in 1932, Angeline remained on the homestead into the 1940s with her remaining three children.¹⁶

Located within the largest Ukrainian settlement in the state, the Gregory home represents regional adaptation coupled with an unwavering approach to maintaining Old World traditions.¹⁷ The bulk of this Ukrainian community resided in northeastern Billings County spanning south into northwestern Stark County.¹⁸ The Gregory homestead's location is approximately ten miles north of Belfield, placing it in the south-central portion of a large community known as Ukrainia.¹⁹ By selecting this specific location Gregory chose to be among a thriving community of like-minded people.

The walls of the Gregory home were built using post-earth construction techniques similar to that of a modern pole barn. Four-to-six-inch debarked cedar posts were placed

¹³Department of the Interior, United States Land Office, *Homestead Papers*, application number 8054, George Gregory, 1907.

¹⁴Ibid.; Christopher Martin, "Skeleton of Settlement: Ukrainian Folk Building in Western North Dakota," *Perspectives in Vernacular Architecture*, 3 (1989):86, accessed January 18, 2010, <http://www.jstore.org/stable/3514296>.

¹⁵Ibid.; Department of Commerce and Labor Bureau of Census, Fifteenth Census of the United States, 1930 Population, Billings County, ND.

¹⁶Department of Commerce and Labor Bureau of Census, Sixteenth Census of the United States, 1940 Population, Billings County, ND.

¹⁷William C. Sherman, *Prairie Mosaic: An Ethnic Atlas of Rural North Dakota* (Fargo: North Dakota Institute for Regional Studies, 1983), 10.

¹⁸Ibid.

¹⁹Theodore P. Pedeliski, "Slavic Peoples." in *Plains Folk: North Dakota's Ethnic History*, Thorson and Sherman, editors (Fargo: North Dakota Institute for Regional Studies, 1988), 262.

approximately three to four feet apart, and then tied together with a top plate of dimensional lumber. Lattice was then attached to the interior and exterior of the posts horizontally about six to eight inches apart. Fir strips were used vertically on the posts to straighten the plane of the wall prior to applying the lattice. The exterior of the wall was sided in what is known today as Dutch lap siding. The interior cavity of the wall was then filled with animal dung, mud, and straw. This mixture was placed inside the wall and tamped in as the siding was applied. The interior of the wall was then treated in a similar manner as the exterior. Horizontal lattice was placed six to eight inches apart, but instead of siding, the wall was covered in a plaster and troweled giving it a smooth finished look.²⁰

In October of 2016, Larry Swenson of the North Dakota State Soil Testing Lab at North Dakota State University, tested samples taken from all three case studies. Samples from the Gregory home were taken from the cavity-fill and the plaster from the interior of the wall.²¹ The cavity-fill consisted of 34% sand, 29% silt, 37% clay, while 3.3% of the mixture consisted of organic matter (manure and straw).²² This mixture was within 2% of the interior wall plaster suggesting that the same mixture was used in both applications.²³ Samples were taken from two buildings two miles to the northeast of the Gregory home that were constructed in the same traditional manner as a comparison.²⁴ With the exception of the low percentage of organic matter in sample one, which may be explained due to poor mixture or a bad sample, the samples are fairly consistent.

²⁰Field researched conducted in three intervals between 2010 and 2016.

²¹Field research to gather samples from case study homes conducted in 2016.

²²Larry Swenson, North Dakota State Soil Testing Lab (Fargo, ND) October 4, 2016.

²³Ibid., Plaster on interior wall mixture: 36% sand, 29% silt, 35% clay, and 2.4% organic matter.

²⁴Sample 1 (1/2 mile to the north): 30% sand, 24% silt, 46% clay, 0.8% organic matter, Sample 2 (2 miles to the northwest): 32% sand, 37% silt, 31% clay, 2.6% organic matter, 2016.

The roof of the structure was constructed with hand-cut rafters of milled lumber spaced the same distance apart as the posts used in the wall construction. Stringers (horizontal supports), placed approximately two feet from the peak, tied the two pitched boards together. Both ends of the pitched boards on each truss ran over the outside edge of the wall where they were fastened to the six-inch boards running horizontally across the top of the outer walls. These horizontal boards, or floor/ceiling joists, tied the outer walls together, acted as lower cords/stringers for the rafters, and made up the framing for the ceiling. The stick frame design was steep in its pitch (10/12 pitch or greater) creating space in the attic for storage or to be used as a living space. The roof consisted of gable ends that were framed from the top of the exterior wall using four inch milled lumber. The interior of the gable was covered in horizontal lattice, filled, and then plastered, suggesting it was used for living space. However, the underside of the roof had no remnants of a finish or insulation that could be identified.



Fig 1. Gregory Home, Photo by author, 2009.

The home was laid out in a two-room style, common among Ukrainians. The west room was the little house (Mala Khata) used as the kitchen and eating area.²⁵ The second room, or in this case the east room, was known as the big house (Velyka Khata), and it was used as a living room and a bedroom.²⁶ Testimony of witness accounts in the Homestead File describes it as a “Cedar Post and Gumbo House with lumber roof 16x30x7.”²⁷ This description is consistent with the home currently under study, but the witness accounts in the Homestead File are for final proof and only describe the existence of the structures at the time. Further study of the material culture suggests that the home went through two stages of construction.

Saw cuts in the shape of the eave are in line with continuous breaks in the siding on the south side of the house suggesting that the big house (Velyka Khata), was added to the east side of the original structure.²⁸ This feature was originally overlooked and mistaken as the remains of a small awning protecting the southwest door. A closer study of the home revealed no other signs of an overhang such as discoloration of wood, out-of-place notches, or nail holes. In relation to the cuts found in the siding, there would have been signs of over-framing on the existing roof, but none were found. Supporting the idea of the home being built in two stages is the thickness of the interior wall dividing the two rooms. Other Ukrainian homes constructed in the same manner have interior walls three to four inches thick, built in the waddle and daub methods. In the case of the Gregory home the dividing wall is approximately eight inches thick. This thickness suggests that the wall dividing the two rooms was once an exterior wall. The top plate

²⁵John C. Lehr, *America's Architectural Roots: Ethnic Groups that Built America*, ed. Dell Upton, (New York: John Wiley and Sons Inc., 1986), 163.

²⁶Ibid.

²⁷Department of the Interior, United States Land Office, Homestead Papers, application number 8054, George Gregory, 1913.

²⁸The consistent cuts run up the entire south wall about ten feet in from the west side of the home just to the right of the southwest door. The out of place cuts in the siding resembling a no longer existing eave are located just above the consistent cuts.

in which the rafters are placed also breaks at this wall, supporting two separate phases of construction.

Other features supporting this theory are the placement of the doors in the western portion of the building and the different stages of deterioration between the two halves of the structure. John C. Lehr explains that in the two common building styles used by Ukrainians, the two-room and three-room styles, there is seldom more than one entrance.²⁹ In the case of the Gregory home, there are four. Exterior openings exist on three sides of the west room and one exterior opening on the east wall of the living area. The existence of so many openings suggests that over time changes were made in the use of the home. These changes are also an example of the residents adapting to their surroundings. Prevailing winds, the addition of the east half of the home, access to nearby outbuildings, and space needed for additional furniture or the placement of the iron stove are all possible reasons for relocating the entrance. There are no signs that any of the doors were filled in; however, this does not rule out the idea that doors were added or simply not in use anymore.

The decomposition of the two halves of the structure also suggests two stages of construction. The western half of the building is almost void of siding. This could be attributed to removal due to the popularity of weathered barn siding, but it is unlikely due to the fact that the siding on the eastern portion of the building is still mostly present. The absence of siding on the west half of the home can be attributed to the more than twelve-inch drop due to the rotting of the cedar posts. The rotting of the posts was mostly due to a combination of several factors, but primarily to poor water run-off. When a post is placed in the ground consisting of clay it forms something similar to a cup. Water soaks into the wood faster than it escapes the hole, causing the wood to rot. This, in combination with water washing away the surrounding top soil around the

²⁹Lehr, 163.

west end of the building during heavy rains, could have easily caused the posts to rot. The east side of the home is fairly level and remains in much better condition, showing a fraction of deterioration as compared to the western half. Considering that the home was built prior to 1913 and resided in through the 1940s, it can be assumed that the decay was never an issue until the home and the surrounding area were no longer maintained.³⁰

As with the Gregory home, the home of Frank Hutmacher is an example of regional adaptation interacting with Old World traditions. The Hutmacher home is located in west central Dunn County approximately fifteen miles northeast of the town of Manning and one mile northwest of what is left of the ghost town of Fayette. The home is constructed in a German-Russian building tradition, which has been well documented throughout the state of North Dakota. While Gregory settled in a large, close-knit community, the Hutmachers found themselves surrounded by larger communities such as the Norwegians to the west, Bohemians to the south, and the Ukrainians to the east.³¹ This could be attributed to the availability of land when Valentine Hutmacher (Frank's father) filed his original homestead entry in 1912.³² Frank Hutmacher was nine years old when he arrived at the port of New York with his parents, Valentine and Frances, and his sister Anna, age 3.³³ Frank was the oldest of the surviving seven siblings; nine, including Anna, passed away prior to the family settling in Dunn County.³⁴ Frank resided with his mother and father until an opportunity presented itself when the county took

³⁰Department of the Interior, United States Land Office, Homestead Papers, application number 8054, George Gregory, *Certificate of Homestead*, 1913; Department of Commerce, Bureau of Census, Sixteenth Census of the United States, 1940 Population, Billings County, ND.

³¹Sherman, *Prairie Mosaic: An Ethnic Atlas of Rural North Dakota*, 11.

³²Department of the Interior, United States Land Office, Homestead Papers, serial number 018108, *Homestead Entry*, 1912.

³³*Ibid.*, *Declaration of Intent*, 1912; *Certificate of Naturalization*, 1918.

³⁴Urlacher (Hutmacher), Emilia (b.1930, Dickenson, North Dakota), interview by Andrea Mott, video recording, Dickenson, North Dakota, 26 June 2009, Dakota Memory Oral History Project, North Dakota State University Libraries, Germans from Russia Heritage Collection, Fargo, North Dakota.

back the land to the west for unpaid taxes; Frank bought the land from the county.³⁵ In 1928 Frank and his wife Veronica built a home on the land and over the next forty years raised five children.³⁶ After Veronica died in 1969 due to complications from surgery, Alex, the youngest of their children, remained on the farm until 1979. His father died in 1974.³⁷



Fig 2. Hutmacher Home, Photo by author, 2009.

The walls of the Hutmacher home were constructed using a combination of shale commonly found in the area, which the Hutmachers quarried from the surrounding hills.³⁸ The stones were split to create a flat surface to better stack and form the walls, and mortar was used

³⁵Hutmacher, Alex (b. 1950, Dickenson, North Dakota), interview by Andrea Mott, video recording, Dickinson, North Dakota, 22 June 2009, Dakota Memories Oral History Project, North Dakota State University Libraries, Germans from Russia Heritage Collection, Fargo, North Dakota.

³⁶Urlacher (Hutmacher), Emilia, interview by Andrea Mott.

³⁷Urlacher (Hutmacher), Eleanor, (b. 1932, Dickinson, North Dakota), interview by Andrea Mott, video recording, Dickinson, North Dakota, 23 June 2009, Dakota Memories Oral History Project, North Dakota State University Libraries, Germans from Russia Heritage Collection, Fargo, North Dakota.

³⁸John B. Bluemle, *Guide to the geology of Southwestern North Dakota*, revised ed. North Dakota Geological Survey, Lee C. Gerhard, State Geologist, 1980.; In an overnight field research outing to the Hutmacher site in 2011, the shadows from the early morning sun revealed shallow pits in the hillside to the northwest of the site. Further research indicated that these were quarry pits. At the base of the hill chipped shale was found suggesting rough cuts were made prior to hauling the stone to the building site.

to finish out the wall. Due to the extensive preservation attempts on the Hutmacher home careful consideration was taken when collecting samples from the home. All samples were taken from the west end of interior and exterior portions of the building, most likely the portions of the building that have been least likely tampered with or recreated. The tests done by the North Dakota Soil Testing Lab revealed the mortar mix consisted of 42% sand, 24% silt, 34% clay, and of 4.4-6.5% organic matter.³⁹ The plaster used on the interior and exterior walls averaged out to 66% sand, 24% silt, 21% clay, and 1.7% organic matter.⁴⁰ The variances between three interior walls and the use of clay were as low as 8% and as high as 36% used for the same purpose. The tests on the exterior mortar reveal a much higher concentration of organic matter. Little straw was found in the testing of the exterior mortar mix.⁴¹ The manure (organic matter) mixed into the plaster and mortar mix gave the mixture a binding quality, strengthening the wall by adhering the stones together and allowing the plaster to stick to the exterior of the wall until it hardened. The interior walls were plastered in the same manner as the exterior. The walls were low, approximately six feet in height, and the gable ends were built up to support the ridge pole that carried the roof. Once the ridge pole was put in place, the gable was built up to meet the plane of the roof.

The roof of the Hutmacher home is constructed in a low 4/12 pitch. The original ridge poles and rafters were most likely constructed with cottonwood trees that were commonly found along the Little Missouri River and its tributaries.⁴² The ridge poles consisted of cottonwood trunks measuring ten to fourteen inches across. The rafters were of the same species, but four to six inches across, and laid out approximately twenty-four to thirty inches apart. Willow branches

³⁹Larry Swenson, 2016.

⁴⁰Ibid.

⁴¹Ibid.

⁴²O.A. Stevens, 110.

were then placed perpendicular to the rafters creating a base to hold the earthen layer in place. Over many years of sitting unattended and exposure to the elements, and due to the entire rebuilding of the roof, the recipe for the roof mix has been lost. There is a possibility that there was never a mixture of earth applied to the original homestead; it very well could have been cuts of sod.

The Hutmacher home consists of four rooms in the building running from west to east. An additional room adorns the southwest side of the home creating an L-shape to the structure. The low profile of the building acts as a shelter from the harsh prairie winds. Because Frank Hutmacher's father, Valentin, resided nearby, there was no need for the construction of a temporary home. In 1928 the first phase of the home was under construction. Much like the Gregory home, the different phases of construction can be found within the interior walls. The wall separating the kitchen from the living room on the west side of the home and the wall separating the two bedrooms on the east side are of the same construction and thickness as that of the exterior walls. The original two rooms would have consisted of a kitchen (Küche) and a bedroom (Schlafzimmer).⁴³ Over the course of several years additional rooms were added on to either end of the building in 1950.⁴⁴ The kitchen was moved to the west end of the building and the room to the east end of the building became another bedroom (Hinterstube).⁴⁵

⁴³Richard Sallet, *German-Russian Settlements in the United States*, 195.

⁴⁴Urlacher (Hutmacher), Emilia, interview by Andrea Mott, 2009.

⁴⁵Ibid.

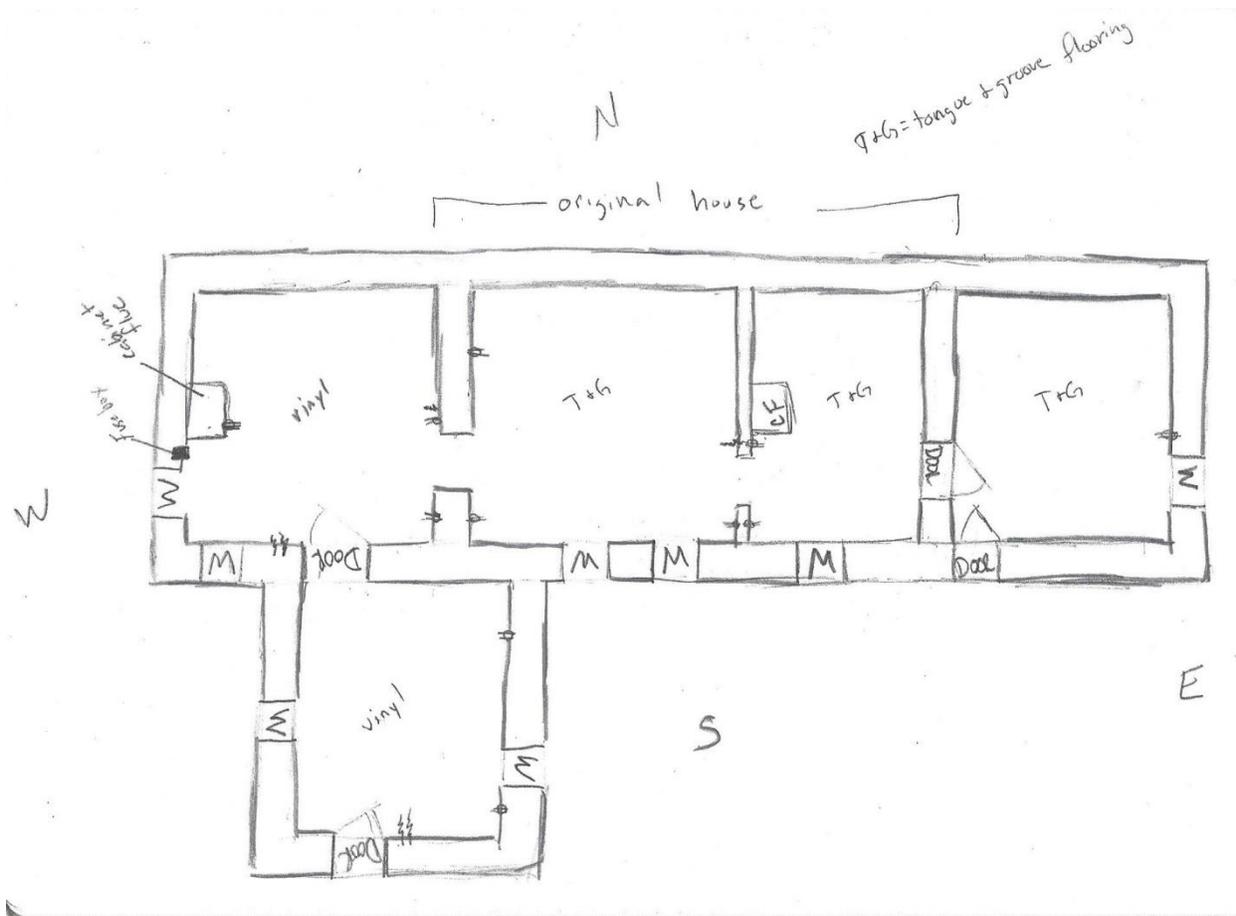


Fig 3. Field sketch of Hutmacher layout by author, 2012.

The final addition to the home was the entryway (Vorhäusl) to the southwest in 1963, which was used as a pantry and space for a new freezer recently purchased by the Humachers.⁴⁶ The majority of the windows to the home face to the south, allowing them to take advantage of the low sunlight in the winter months, while the deep window wells kept it at bay in the summer. Windows on the east and west side of the building are minimal. Each gable end consists of one window and the southwestern addition has a window on either side. Those are the only windows

⁴⁶United States Department of Interior, Heritage Conservation and Recreation Service, National Register of Historic Places, Inventory-Nomination Form, State Historical Society of North Dakota. Kurt P. Schweigert. Bismarck, North Dakota, 1979.; Informal interview with Eleanor Urlacher (Hutmacher) during a walkthrough of the hoe in 2010.

that receive any direct sunlight in the short summer months.⁴⁷ There are no windows on the north side of the building.

The methods by which the Hutmacher home was built are well documented. Their choice to build in this manner is directly related to tradition and their frugality.⁴⁸ Their choice of location to build the home is indicative to the Hutmachers themselves. During the period when Valentin originally homesteaded, and much of the time Frank lived in his home, they were within a mile of a town called Fayette. Fayette was established in 1889 by Frank Little but is now just a remnant of a past era.⁴⁹ During its prime the Hutmachers utilized it for trading and selling goods. The Hutmacher location was selected with three things in mind: availability of materials, access to trade and goods, and ultimately, family.

Of the three case studies, Jalmer T. Ruud's is unique in the sense that he did not immigrate for the purpose of homesteading on the plains. His parents, Hans and Ellen immigrated to the United States from Norway in 1870 and settled in Cromwell Township, Minnesota, just north of Hawley, where Jalmer and his sister Emma were born and raised.⁵⁰ Jalmer, a Minnesota-born Norwegian, filed his intent to homestead in March of 1906 for land in east-central Bowman County.⁵¹ Jalmer proved up his homestead in 1909 under a commutation amendment which allowed the applicant to be away from his land for larger periods of time.⁵² Commutation was commonly used by those who either had to travel or were intending to sell their land upon final proof; however, its intentions were for those people needing time to travel

⁴⁷Field research in July of 2012.

⁴⁸Eleanor Urlacher (Hutmacher), 2010.

⁴⁹Mary Ann Barnes Williams, *Origins of North Dakota Place Names* (Washburn: Bismarck Tribune, 1966), 98.

⁵⁰Twelfth Census of the United States, Schedule Number 1- Population, 1900.

⁵¹Department of the Interior, United States Land Office, Homestead Papers, Application number 2759, Jalmer T. Ruud, 1906.

⁵²Ibid.

in order to straighten up affairs at home or to gather documents required for the final proof.⁵³

Final witness testimony states that Jalmer was absent for six months in 1907 and 1908 “to fix up matters regarding homestead.”⁵⁴

Much like the Hutmacher home, the Ruud home is not located among those of fellow Norwegians; however, large Norwegian communities exist east and west of the homestead.⁵⁵ The Ruud home is an example of the builder using multiple building methods through the use of local and prefabricated materials. By definition, the home is considered a sod home due to the use of sod for the exterior walls; however, this is the only place where locally harvested materials were used. The exterior walls are approximately two feet thick, consisting of layers of sod placed in an alternating pattern with the grass facing down, which according to Roger Welsch was a common method in sod home construction.⁵⁶ Welsch also mentions that in every third or fourth layer a course of sod was laid perpendicular with the others in order to tie the sod bricks together, but in the case of the Ruud home it looks as though the sod was laid in alternating pattern similar to brick. Identifying the way that the sod was laid could only be done through the identification of cut marks made during the original build; erosion and cattle rubbing have eliminated any marks.⁵⁷ The interior and exterior of the outer walls are plastered with an inconsistent mixture of concrete. Finding from the North Dakota State Soil Testing Lab found the mix to be 56-80% sand, 4-22% clay, and organic matter ranging from 2.7 to 5.5%.⁵⁸ These inconsistencies suggest that Ruud may have been inexperienced in this type of construction.

⁵³Gates, *History of Public Land Law Development*, 490.

⁵⁴Department of Interior, United States Land Office, Homestead Papers, Application number 2759, *Testimony of Witness*.

⁵⁵Sherman, *Prairie Mosaic: An Ethnic Atlas of Rural North Dakota*, 10.

⁵⁶Roger L. Welsch, 42.

⁵⁷*Ibid*; Field research, 2016.

⁵⁸Larry Swenson, 2016.

The roof of the Ruud home is constructed in a hip-roof style using milled lumber. The angle cuts and the symmetry of the roof itself suggest that it was done by a skilled individual, possibly Ruud himself. Horizontal cords that were also used as the ceiling joists gave the roof strength. The framing is sheathed with milled planking and then shingled with cedar shakes. The ridges of the hip roof are covered with a fabricated metal ridge cap.

The most interesting aspect of the roof is how it is attached to the sod walls. Scattered throughout the walls six-to-ten-inch boards averaging about four feet in length were placed flat on the top of the sod wall. A large half-inch threaded bolt, about sixteen inches long, was run through the bottom of the board. Three more layers of sod were then laid on the top of the walls, over the boards. Another board was then placed over the sod and attached to the bolts sandwiching the three layers of sod together between the boards. The rafters were then nailed to the upper board. Originally, it was thought that this was done at a later date, but further research of the building revealed that the sod above and below the boards were of the same cut and discolored at the same rate.

There is no particular pattern or sign of ethnic tradition to the Ruud home. If anything, the home is more of a modern-day home than one of carried over traditions. All of the exterior walls have at least one window, with doors in the front and the back of the house. The layout of the interior is fairly open in comparison to the other case studies. The entryway is attached to the living room creating an L-shaped pattern. To the south of the entryway is a door leading to the kitchen and the west is another door leading to the bedroom. On the west side of the kitchen a door leads to an addition that was possibly used as a mud room or even a summer kitchen. Aside from the addition to the west, the main building shows no signs of being added onto, suggesting that it is in its original form. All of the interior walls of the home are framed with milled lumber.



Fig 4. Ruud Home, photo by Katherine Schultz Magness, 2009.

In his survey, L. Martin Perry suggests that the Ukrainians went through three evolutionary stages of home building when settling the American Plains: the dugout (first to arrive), the earth house or sod home (peak of settlement), and the framed house (later settlement).⁵⁹ Perry’s survey focuses on large scale settlement, and his hypothesis holds true to a degree. What Perry does not take into account was the choices made by the individuals, their preparedness, or their experience. The more established the community of specific ethnic groups, the more likely the homesteaders were to have a place to stay while they constructed their home, therefore skipping the entire first step of Perry’s evolution. George Gregory settled among a large Ukrainian

⁵⁹US Department of Interior, National Register of Historic Places, *Ukrainian Immigrant Dwellings and Churches in North Dakota from Early Settlement Until the Present*. Prepared by L. Martin Perry for the State historical Society of North Dakota (Bismarck, ND, 1987), 14.

community and constructed a portion of his home in Ukrainian tradition, knowing he would add to the home at a later date. In the case of the Hutmacher home, staying close to family allowed Frank Hutmacher to construct a home in the same continued tradition as his father. The Ruud home, being in its original form, suggests that Jalmer Ruud was prepared to build on the plains and constructed his home as he saw fit.

Great Plains historiography characterizes the earth home as a temporary structure; however, through the study of material culture and building methods it can be determined that many of these homes were built with the intent to last. The techniques used in the three case studies are not techniques one would find being used in the construction of a home intended to be used for a short period of time. The care taken in the construction of the original home can be found in the intricate cuts in the roof lines, the placement of the homes in correlation to the surrounding area, and the materials used in their construction; all of these suggest that these homes were built with the intent to last.

CHAPTER THREE: A CONTINUED PURSUIT

“Through time, names accumulate on the land and combine to recall its history: the sequence of settlement, the conflict between the invader and native.”¹

~Henry Glassie

The struggle to gain a foothold on the plains was a real problem for many settlers. Between 1881 and 1904, approximately 2,285,800 homestead entries were filed.² Of those claims, approximately 534,301 went to final proof.³ Wealth, the support of family and community, or even a well-thought-out plan did not guarantee success. These attributes may have eased some of the burden of life on the plains, but for many, the requirements to make final proof and what the plains had to offer were simply too much to bear. It is this “conflict between invader and the native” that Glassie is trying to point out in the above excerpt, a conflict between the settler and the environment and how it relates to the aspects of building within that environment. Moreover, it is how those settlers, who did make final proof, adapted to their living conditions. Those familiar with building on the plains, as with those who were willing to adapt, found themselves in a better position than those who haphazardly rushed into it. Once the original shelter was constructed, it can be assumed that at least some of the tensions could be relieved, allowing time to address further issues in developing a successful homestead. The way in which these settlers interacted with their homes and their surroundings demonstrates their intent through their adherence to cultural traditions and their willingness to adapt.

George Gregory and Frank Hutmacher chose to stick with traditional building methods, whereas Jalmer Ruud borrowed building traditions from those who were familiar with living in

¹Glassie, *Material Culture*, 231-32.

²Paul W. Gates, *History of Public Land Development*, 494.

³*Ibid.*; Gates explains the inconsistencies in the data due to additional land laws and amendments to current laws which were recorded differently depending on the government organization and the time the new laws were issued. Gates gathered his information from *The Report of the Public Lands Commission* (Washington, 1905) “in the hope that because it was compiled later than the annual reports they may be more accurate.”

this type of environment. None of these homes are exact duplicates of the buildings constructed in their homeland. In his journal article, Christopher Martin cites several interviews with immigrants confirming that the post-earth, cavity-fill method used by Gregory comes from the Galicia area in the eastern portion of the Austro-Hungarian Empire, or modern-day western Ukraine.⁴ Variances in the placement of the posts, as with the cavity-fill mixture and the treatment of the exterior walls, exist, but the general use of the two methods was indeed carried over to the American plains.⁵

Frank Hutmacher constructed his home in the same manner as his father Valentin did. Valentin, of German-Russian descent, constructed his home of stone; however, its architectural features represent what Michael Koop states as the “unusual synthesis of central-European and Russian-Ukrainian architecture.”⁶ Domestic architecture among the Ukrainians and the German-Russians who settled on the American plains varies within villages and the availability of materials. Both ethnic groups built structures made of stone, clay brick (batsa), and rammed earth, as well as logs.⁷ The main difference between the two ethnic groups is that the Ukrainians tended to lean toward log construction while their German-Russian neighbors preferred building with batsa.

The sod home constructed by Jalmer Ruud is unique when it comes to trying to identify whether or not Ruud was adhering to traditional methods or if he adapted his methods due to the available materials on his land. Unlike Gregory, who was born in Austria-Hungary, and Hutmacher, who was born in Russia and raised in an earth home, Ruud was born in Minnesota.

⁴Christopher Martin, “Skeleton of Settlement: Ukrainian Folk Building in Western North Dakota,” *Perspectives in Vernacular Architecture* 3 (1989): accessed January 18, 2010. <http://www.jstore.org/stable/3514296>.

⁵Ibid.

⁶Michael Koop, “German-Russians,” in *America’s Architectural Roots: Ethnic groups that Built America*, ed. Dell Upton (New York: John Wiley & Sons Inc., 1986), 130.

⁷Ibid., 130-35; John C. Lehr, 160-65.

The connection can be made back to Norway through his father, Hans, who was born there.⁸ Log construction, in different variations, was the most prominent type of building method in Norway due to the ample supply of lumber found among the inland villages.⁹ Along the coastal regions several different variations of sod construction dominated the landscape.¹⁰ Ruud likely chose sod for the exterior walls in his home for its insulation value and ease of construction considering he had approximately two hundred trees to draw lumber from on the homestead.¹¹ All three case studies show signs of both tradition and adaptation, which can be found within the materials they left behind.

At the time George Gregory filed his intent to homestead they had no children of their own; it was just George and his wife, Angeline.¹² This allowed both George and Angeline to focus on building a home and proving up their land. The addition to the original home was added to the east side within the time it took to prove up the homestead. The east and west ends of the roof were gabled with the east gable facing the road. The road (US 85) was not designated until 1925.¹³ Whether it was circumstance or that there was already a trail there, the gable end facing the road suggests a Russian influence in its orientation.¹⁴ The gable end facing the road was adorned with decorations such as carved cornice boards, paint patterns, and window treatments.¹⁵ Due to the exposure to the elements, the only feature remaining is the occasional glimpse of

⁸Department of Commerce and Labor Bureau of Census, Thirteenth Census of the United States: 1910 Population, Bowman County, ND.

⁹Lena A:son Palmqvist, "Nordic," in *Encyclopedia of Vernacular Architecture of the World*, Vol. 2, ed. by Paul Oliver (Cambridge: Cambridge University Press, 1997), 1381.

¹⁰Ibid.

¹¹Department of Interior, United States Land Office, Homestead Papers, Application number 2759, Testimony of Witness.

¹²Department of Interior, United States Land Office, Homestead Papers, Application number 8054, Certificate of Naturalization; Department of Commerce, Bureau of the Census, Fourteenth Census of the United States: 1920 Population, Billings County, ND.

¹³North Dakota Department of Transportation, History 1921-1940, accessed November, 2016. <http://www.dot.nd.gov/public/history.htm>.

¹⁴Myron O. Stachiw, "Ukraine, Belarus, and Eastern Europe," in *Encyclopedia of Vernacular Architecture of the World*, Vol. 2, ed. Paul Oliver (Cambridge: Cambridge University Press, 1997), 1430.

¹⁵Ibid.

paint found under the lap siding and soffits. As opposed to the gable facing away from the road, the east-facing gable shows signs of a fascia and soffit via exposed nails and the remnants of a quarter round trim, also supporting the idea of Russian influence and the intent to construct the home in a traditional manner.

The attic was extended in the same manner as the initial building. The attic space was created due to the stick-framed construction of the rafters and was accessible via an opening in both gable ends. The use of this space is in question due to the lack of nail holes that would indicate the existence of floorboards. However, this does not mean that boards were not present; they could have simply not been attached to the stringers. The attic may have been used for storage or as a place for children or guests to sleep.¹⁶ By 1930, George and Angeline had seven children, four girls and three boys, so the choices in how the home was constructed make a little more sense.

Inside the gable ends, the finishing was the same as the interior walls of the lower portion of the home; they were insulated and plastered. This suggests that the attic was used as some sort of living space, most likely for the children. Having to enter from the exterior of the home eliminated the use of stairs. However uncomfortable it may have been to climb a ladder to a bedroom in the middle of winter, it saved much needed space in the lower portion of the home. Due to its larger size, the west gable was most likely the entrance. The east end served two purposes: ventilation in the summer months and a second method of escape if the need arose. These attic accesses are found in every example of Ukrainian building style researched in the area, including barns.¹⁷ Those who built using this stick-framed method of construction understood and utilized the space it created.

¹⁶Martin, 92.

¹⁷Field research, 2016.

With the exception of the posts and some of the interior lathe, the Gregory home consisted primarily of milled lumber. Gregory made a conscious choice in harvesting his own posts and choosing the location of his homestead. Billings and Grant counties hold the largest range of eastern red cedar (*Juniperus fovirginiana L.*), which is most likely the cedar used in the home.¹⁸ This lack of milled posts reveals an adherence to traditions, but could also be attributed to saving money. Using milled posts would have made the plane on the interior and exterior of the walls smooth; it required little to no shimming and saved valuable time. Running short on his supply of milled lumber did not slow down the building process; Gregory simply resorted to traditional methods to continue the project. Throughout the home, split willow branches are used in random areas among the milled lathe; they could have been harvested from any of the local ravines. One could attribute this use of traditional methods to a lack of funds, but it was more likely an issue of time or quality of lumber available in the area. Harvesting one's own posts, which are the foundation of one's home, guarantees the quality of the product will be to one's own standards.

Little remains of the interior of the Gregory home. All of the interior walls were plastered with a similar mixture used in the cavity-fill and then painted in traditional (similar to German-Russian tradition) pastel pink. Because of the framing of the attic rafters, Gregory had a place to attach a tongue-and-groove bead board on the ceiling, which was painted in a bright pastel color of teal. The same style of boards was used for the trim around the windows, doors, and also on the floor. The beaded side was turned down to create a smooth surface. The base, which runs around the bottom of the walls, is about six inches high with a decorative trim on the top. All of

¹⁸US Department of Agriculture, Rocky Mountain Forest and Range Experiment Station, Eastern Red cedar Seed Sources Recommended for North Dakota Sites, Research Note Rm-371, May 1979. Pg 2.

the trim and base are painted a slightly darker shade of teal than the ceiling. There are no signs that electricity was ever added to the building.

Of the three case studies the Gregory homestead has the least amount of outbuildings remaining. The final proof of the Homestead papers states that the outbuildings are located in the northeast corner of the claim, consisting of a “Mud Granary 16x20x7...and a Cedar Post and Mud Barn 18x60x7.”¹⁹ All that remains are fence posts, barbed wire, and slight depressions in the land. During a brief encounter with the landowner of the property on the east side of US 85, across from the Gregory homestead, the man stated that there used to be a barn built in the same fashion as the Gregory home. It was located next to a drinking reservoir for his cattle. The farmer (unidentified) stated that it was a large barn and it had to be torn down so the cattle would not injure themselves.

Evidence of a possible granary is present directly to the north, but there are no signs of the larger barn in the immediate vicinity.²⁰ After looking at barns constructed in the same Ukrainian traditions in the area, it came to my attention that plaster was commonly used on the exterior walls of the barns. The walls and the roof were built using the same method as the home. Taking into account the size of the building, the cavity-fill, the exterior plaster, and the fact that for years the barn floor was covered in manure, it would seem that a much larger footprint would have been left behind. This would suggest that the barn the farmer described may have very well been owned by the Gregory family.

As opposed to the Gregory homestead, the Hutmacher farm has been well documented and evidence of all of the buildings remains. The original construction of the home was in the same manner as the home in which Frank Hutmacher grew up. The windows of the home were

¹⁹Department of Interior, United States Land Office, Homestead Papers, application number 8054, George Gregory, 1907.

²⁰Field research 2010, 2011, 2016.

set into the wall eight to ten inches from the exterior plane, creating a deep sill. This style of window, predominantly located on the south-facing side of the home, kept the hot summer sun at bay while gathering the southern sun in the winter months. Windows placed at the east and west sides of the house were at a minimum. Each gable end exhibited one window, as did the vestibule, built in the same manner. There were three entrances into the home, all on the south side. The windows and door all have large rough cut timbers acting as headers. The four-pane windows were likely purchased in the town of Fayette, where the Hutmachers did much of their shopping and trading. The interior and exterior doors were hand-made of planks. Photographs of the home taken in 1979 by Kurt Schewiegert reveal the use of a curtain between the living room and the kitchen. The roof was made up of large cottonwood ridge beams with smaller sized trunks of the same species making up the rafters. The decision to stick with traditional methods in constructing his roof demonstrates the confidence Frank Hutmacher had in his building technique.

Donna C. Roper's study of the materials used in the construction of Hidatsa earthlodges raises some interesting points about the choices and placement of materials by the Hidatsa that can be directly related to Hutmacher home.²¹ The use of the material in the frame-work and the branch layers of both the Hutmacher site and Hidatsa earthlodges depended on the availability of local materials – materials that, through years of experience, both builders knew worked together. The cottonwood used in the Hutmacher roof has a low tolerance to rot and decay, as does the willow.²² This means that this species of wood is more susceptible to rot than other species. Roper states that she knows “of no accounts that indicates why willows specifically, as

²¹Donna C. Roper, “Earthlodge Dynamics 101: Construction and Deterioration Issues and Their Lessons for Archaeologists,” in *Plains Earthlodges: Ethnographic and Archaeological Perspectives*, ed. Donna C. Roper and Elizabeth P. Pauls (Tuscaloosa: University of Alabama Press, 2005.), 111-132.

²²*Ibid.*, 117.

opposed to other branch types, were used for lodge construction.”²³ Roper answers her own question by sampling a batch of willows from a Dancing Leaf Earth Lodge, where, at demolition, showed no signs of decay.²⁴ Roper goes on to state the willow layer “probably also promotes airflow and drying and keeps the moist grass from direct contact with the wood of the roof and wall, and that the moisture values of the willows, while higher than those on the wood frame, may still be below the point at which decay will set in.”²⁵

What can be taken from Roper’s study is that two separate groups of people adapted to their environment by using what was available to them, and they applied it in a way that compensated for its weaknesses. What Roper fails to mention is the possible effect that those residing in the home have on the roof. In addition to the willow branches creating airflow, allowing the moisture to dissipate, the heat created from fires and stoves within the home sped up the drying process. Alex Hutmacher stated that the framing of the roof was never replaced.²⁶ Every two to four years they made major repairs, replenished the earth mixture, and occasionally repaired leaks during heavy rains, though that was unusual.²⁷ This meant that the Hutmacher roof stayed structurally sound for over forty years. This does not mean that it never leaked. The occasional leak during heavy rains was one thing, but Emilia (Hutmacher) Urlacher remembers having “a little snow bank on top of [her] pillow.”²⁸ The snow did not necessarily come from the roof; it came from where the roof met the wall.²⁹

²³Ibid., 120.

²⁴Ibid.

²⁵Ibid.

²⁶Hutmacher, Alexander (b. 1950, Dickinson, North Dakota), interview by Andrea Mott, video recording, Dickinson, North Dakota, 22 June 2009, Dakota Memories Oral History Project, North Dakota State University Libraries, Germans from Russia Heritage Collection, Fargo, North Dakota.

²⁷Ibid.

²⁸Urlacher (Hutmacher), Emilia (b. 1930, Dickinson, North Dakota), interview by Andrea Mott, video recording, Dickinson, North Dakota, 26 June 2009, Dakota Memories Oral History Project, North Dakota State University Libraries, Germans from Russia Heritage Collection, Fargo, North Dakota.

²⁹Ibid.

As the home grew with the addition to the east and west ends in 1950 and the vestibule in 1968, the Hutmakers continued to follow traditional building styles and adapt when and where they had to. One example is the center post that was needed between the original two rooms. The span was too great, so a post was added to the narrow walls dividing the rooms. Much like Gregory, Hutmacher used his adaptive skills, omitting the use of milled lumber, and built his own post using the materials that were available. The post was made from a trunk of a cottonwood with a fork in it. The post was then cut so the seat in the fork was at the proper height to carry the beam. Notches were then made in the post and a block was placed level with the notches for the beam to rest on. The beam was then notched to fit. This kept the fork from splitting and dispersed the weight from the downward pressure of the beam. Barbed wire was then tightly wrapped around the base of the fork to strengthen the post. This use of available materials displayed adaptive skills and the frugality of the builder. In 1975 the ridge beam began to sag so as a precautionary measure a six-by-six milled post was placed under the beam revealing the first structural weakness recorded in the roof.³⁰

³⁰United States department of Interior, Heritage Conservation and Recreation Service, National Register of Historic Places Inventory – Nomination Form, Kurt P. Schweigert, 1979.

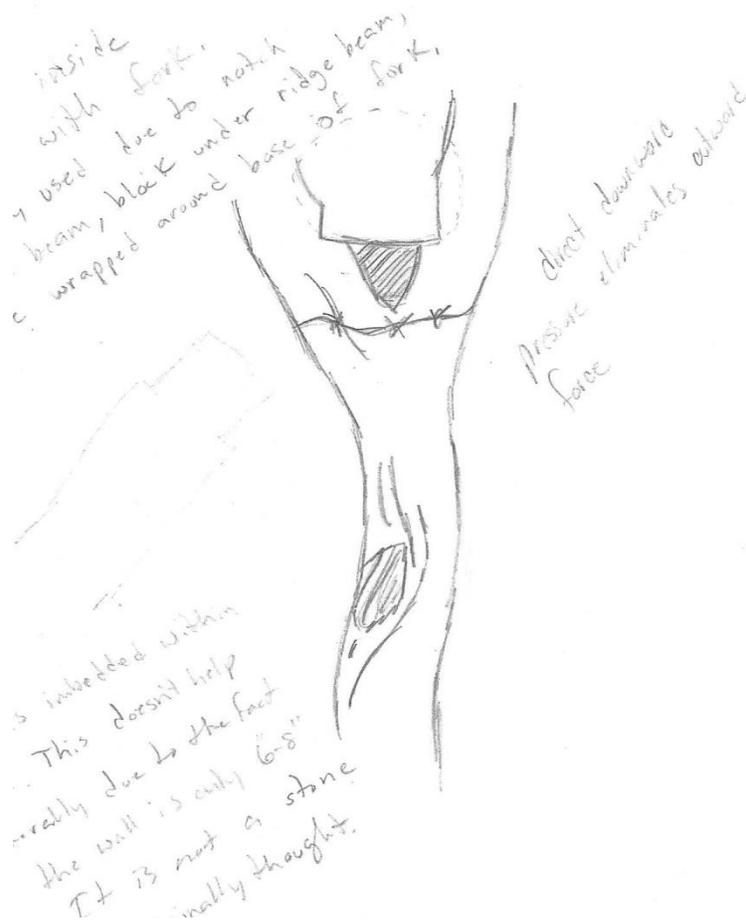


Fig 5. Field sketch of center post by author, 2012.

The interior walls of the home were plastered and then painted in bright traditional pastel pinks, greens, and teals. The ceiling was covered in cardboard attached to the cottonwood rafters using the lids of canning jars nailed through the center. A type of oil cloth was glued to the ceiling using homemade glue.³¹ The cloth and cardboard hid the rough framing of the roof and captured chunks of dirt that would occasionally make their way into the interior of the home.³² The plastering of the interior walls was covered with the same oil cloth to make it easier to

³¹Hutmacher, Alexander (b. 1950, Dickinson, North Dakota), interview by Andrea Mott, video recording, Dickinson, North Dakota, 22 June 2009, Dakota Memories Oral History Project, North Dakota State University Libraries, Germans from Russia Heritage Collection, Fargo, North Dakota.

³²Informal interview with Eleanor (Hutmacher) Urlacher, 2010.

clean.³³ The finishing of the walls and the ceiling eliminated many of the sharp corners often associated with stick-framed homes, giving the Hutmacher home the feel and look of a cave, or what Emilia referred to as “the root cellar.”³⁴ The original floor of the home was dirt, but over the years a wood floor was added consisting of tongue-and-groove Douglas fir. Vinyl laminate was then added in the kitchen and the vestibule, covering the wood floors.

With the exception of the privy, which was stick-framed, the outbuildings were all constructed in the same fashion as the home. There are five outbuildings in total, including the cellar. The buildings took a crescent shape around the home beginning with the granary located just to the northeast, the garage, the cellar, the chicken coop, and finally the barn to the southwest. The privy was placed in between the granary and the garage. Attempts to upgrade the roofs can be seen on the granary and the chicken coop through the placement of a wire mesh between the rafters and the willow branches. It can only be assumed that this was an attempt to stabilize the willow branches and the clay mixture due to the unfinished ceilings. The interior walls of the granary were plastered but not painted, most likely to keep vermin out of the grain. The remaining structures were left in their raw form, as were all of the ceilings.

Throughout the Hutmacher complex there are signs that nothing went to waste. The remains of planks were used as shelves and attached to the wall by embedding long stakes into the mortar and resting the plank on the exposed stake. Thread spools were nailed on the back of the doors for hanging clothing and any other items. The remnants of an old crate were used in building a boxed-in shelving area in the bedroom. Milled lumber was used if it was available, but when it was not, small branches two to three inches in diameter took its place. In 1963, when

³³Urlacher (Hutmacher), Emilia (b. 1930, Dickinson, North Dakota), interview by Andrea Mott, video recording, Dickinson, North Dakota, 26 June 2009, Dakota Memories Oral History Project, North Dakota State University Libraries, Germans from Russia Heritage Collection, Fargo, North Dakota.

³⁴Ibid.

electricity was added to the home, scrap pieces of wood were used to mount the switches and outlets. Even the bath water rarely got changed.³⁵

Of the three case studies it is the Ruud home that raises the most questions. Jalmer Ruud, of Norwegian ethnicity, born and raised in the United States, built a sod home in the southwestern-most part of North Dakota. Ruud either homesteaded to profit from his land after final proof or he was one of those settlers who simply could not handle what the plains had to offer. Three years after filing for a homestead claim Ruud filed for commutation.³⁶ Under this law, the person filing the homestead claim did not have to reside on the homestead continually, but was only required to live on the land for fourteen months during the proving up phase.³⁷ This was intended to allow individuals to wrap up their affairs needed for final proof.³⁸ It was also common for people to file commutation papers if they were intending to sell the land after they made proof.³⁹ Another curious fact is that in the 1900, 1910, and 1920 censuses Jalmer Ruud is not listed as the head of household and only in the 1910 census is he listed as living in Bowman County.⁴⁰ From 1906 when he filed his claim to the 1920 census, there is no mention of him being married. This, coupled with him having no direct building experience in his native home of Norway, his decision to build a sod home suggests the benefits of the home itself – its ease of construction and the well-known insulation factors.

³⁵Urlacher (Hutmacher), Eleanor, (b. 1932, Dickinson, North Dakota), interview by Andrea Mott, video recording, Dickinson, North Dakota, 23 June 2009, Dakota Memories Oral History Project, North Dakota State University Libraries, Germans from Russia Heritage Collection, Fargo, North Dakota.

³⁶Department of the Interior, United States Land Office, Homestead Papers, application number 2759, Jalmer Ruud, 1906

³⁷Gates, 490.

³⁸Ibid.

³⁹Ibid. It was specifically common among those inexperienced with farming, such as “clerks, business men, professional men, school-teachers, mechanics, waitresses, woodsman, cruisers, and city laborers.” (Jalmer Ruud is listed as a farm labor)

⁴⁰Department of Commerce, Bureau of Census, Fourteenth Census of the United States, 1900, 1910, 1920 Populations.

The home was thought to be the original home constructed on the homestead, but the testimony of claimant and witness describe a much smaller home originally built during final proof of the homestead.⁴¹ It also states that the barn and chicken coop were constructed of sod and timber, as was the home itself.⁴² There is no evidence in the landscape that is visible from the ground to indicate that these buildings existed.⁴³ This does not dismiss the fact that the home may have very well been added onto. Cultivation may have covered up any evidence of the original sod structures or the framed structures that currently reside on the property may have been built on the same sites. Even if the Ruud home was not the original structure, the upgrades made to the property and the home over time support the idea that this home was constructed as a permanent structure through the use of modern building techniques and borrowed traditions.

The Ruud home consists of sod exterior walls that are plastered on both the interior and the exterior of the home. Stakes and six-to-eight-inch nails were driven in the walls, and barbed wire was attached to them horizontally to aid in supporting the weight of the inch-and-a-half-thick concrete/grot mix.⁴⁴ Of the three case studies, this is the only home to use concrete on the exterior. The plaster on the interior of the home, much like the Hutmacher home, was applied directly to the wall. Windows (double hung) are present on all sides of the house and are much taller than those found in the other case studies. The window panes were placed toward the exterior of the wall leaving a deep sill on the interior. The same taper is present on the doors. The interior and exterior doors were all hand made with milled lumber using a typical z-pattern similar to those found on the other sites.

⁴¹Jalmer Ruud, Homestead Papers, Witness Testimony, 1909.

⁴²Ibid.

⁴³Field research, 2016.

⁴⁴Due to the present condition of the home the interior of the sod wall is exposed in some areas. There are no signs of the stakes being driven through the walls from the interior and the lengths of the stakes are too short to have been applied in this manner. Field research, 2016.

The layout of the home consists of four rooms, five counting the addition to the west side. The living room and the entryway are adjoined, but are considered separate rooms because of their different uses. All of the interior walls are framed with milled lumber, sheeted in rough planking, and covered with either sheetrock or quarter-inch paneling. The ceiling and the floor are covered with the same style of tongue-and-groove bead board found in both the Hutmacher and the Gregory homes. The ceiling was then covered by the same style of paneling found on the walls. One-by-fours were attached over the paneling in a checker board fashion. This method is used to give the ceiling an architectural feel and to keep the thin paneling from sagging over time. The chimney was built using fired bricks, as opposed to the beehive construction of the chimney in the Hutmacher home, and is located in the entryway.

The interior doors of the Ruud home are trimmed with one-by-four material, the same material which is used as a base trim existing everywhere the walls meet the floor. Some of the walls are painted in a pastel teal/green color and others in a pink, resembling the same shades as those found in the other case studies. The trim surrounding the doors is painted white. The base colors vary depending on the color of the wall. The walls that are painted in teal have pink as the base color, and those that are pink use teal. The ceiling is colored pink.

On the west side of the home there is an addition that was used as a kitchen.⁴⁵ It was constructed entirely of milled lumber and placed on a foundation. The interior walls are covered in the same quarter-inch paneling as the interior of the home, but the ceiling was never finished. It may have been intentionally unfinished to give the heat a way to escape, preventing the kitchen from getting too hot. Windows on either side of the kitchen would allow more ventilation in the summer months. The roof of the addition was built in the same manner as the main house.

⁴⁵Tom Isern, "Plains Folk: Sod Houses and Social Structures," *Plains Folk*, 1998, accessed February 2010, <http://www.prairiepublic.org/radio/radio-programs-a-z/plains-folk?post=1077>.

The heavy use of milled lumber and the intricate cuts needed to build a hip roof indicate a skilled builder. The weakness in the builder's skills is revealed where the roof of the kitchen meets the roof of the main house. Typically, and for better run-off, the addition would have been over-framed onto the main roof creating two valleys dispersing the water away from the kitchen. This was not the case in the Ruud home and is noticeably the weakest point in the home.

Electricity was added to the home in 1950.⁴⁶ The entire house is wired in the same manner that homes are wired today. All of the wiring is fed through the interior framing of the house via the attic and down through the interior walls. Metal electrical boxes, common switches, outlets, and cover plates found in early twentieth-century homes are used throughout the house.⁴⁷ There are no signs of running water in the home, but there is a windmill just outside of the kitchen.

⁴⁶Ibid.

⁴⁷The switches and outlets found in the Ruud home are identical to the ones found in the author's home which was built in 1902.



Fig. 6. Ruud home roof framing. Photo by author, 2009.

Under the Ruud home is a unique feature not seen in the other case studies: a cellar. The cellar is accessed through an opening on the south side of the building. It is about six feet wide and extends just beyond the kitchen, approximately eight feet, with a ceiling height of five to six feet.⁴⁸ Walls holding back the dirt are built using posts and twelve-inch planks. Rough cut beams carry the six-inch floor joists. Shelves line the planked walls, and the cellar is even fitted with electricity. The cellar could be attributed to the Faeroese tradition in Norway of the byre, a room dedicated to storage.⁴⁹ The byre could be located in a different building or in the basement of the

⁴⁸Measurements are approximate. Access to the cellar was cut off due to a cave in at the entry. Photos to estimate the measurements were taken through a hole in the floor of the main part of the house. Field research, 2011.

⁴⁹Jóan Pauli Joensen, "Nordic," in *Encyclopedia of Vernacular Architecture of the World*, Vol. 2, ed. Paul Oliver (Cambridge: Cambridge University Press, 1997), 1387.

home.⁵⁰ In the case of the Ruud home it was used as a cellar, a traditional adaptation to this style of home.

The Ruud home includes five outbuildings located to the south of the house. Of the five structures, only two remain standing: the largest of the five, which has been determined to be the barn, and the smallest, which could have been used for anything from a garage to a chicken coop. All of the buildings are constructed using milled lumber. Three types of roof coverings are present among the buildings. The barn consists of asphalt shingles, and one of the mid-sized buildings had a corrugated steel roof, while all of the other buildings have cedar shakes. The variances in the roof coverings suggest that the buildings were maintained well into the twentieth-century.

George and Angeline Gregory resided in their home for over forty years. After George's death, Angeline remained in the home well into the 1940s. Frank and Veronica Hutmacher lived in their home together for just over forty years as well. The last one to remain in the home was their youngest son Alexander who moved out in 1979. For just over fifty years the Hutmacher home was lived in.⁵¹ As for the Ruud home, it does not matter whether Jalmer built his home or not. The fact that the home has been standing for over seventy years is a testament to the skills and intent of the builder. In an interview with Bernice Larson, conducted by Tom Isern, distinguished professor of history at North Dakota State University, Larson stated that she rented the Ruud home from 1942 to 1960 in its current state.⁵² It is unknown whether the home was

⁵⁰Ibid.

⁵¹The Hutmacher home was built in 1928 and three additions to the home have been recorded. Alexander lived alone in the home after Frank passed away in 1974.

⁵²Tom Isern, "Plains Folk: Sod Houses and Social Structures," Plains Folk, 1998, accessed February 2010, http://www.prairiepublic.org/radio/radio-programs-a-z/plains_folk?post=1077.

rented again after she and her family moved out, but as of 2016 the home is still upright, albeit in poor shape.⁵³

The way in which the builders of all three case studies interacted with their homes can be seen through their methods of construction and their ability to adapt to their surroundings. Their adherence to traditions and the blending of those traditions when using materials that were available to them reveal their intentions and their tenacity to succeed. Their skills in adapting to their surroundings and the longevity of the homes themselves are proof that these homes were built with purpose and intended to last.

⁵³Field research, 2016.

CHAPTER FOUR: AN UNCHARTED ENDEAVOR

The practice of historic preservation is most commonly associated with structures located within densely populated communities. In their work, *Historic Preservation: An Introduction to Its History, Principles, and Practice*, Norman Tyler, Ted J. Ligibel, and Ilene R. Tyler state that the reasoning behind this is because the study of “[h]istoric preservation has focused primarily on cities and their historic landmark buildings and districts.”¹ This is not a coincidence. Urban projects allow the preservation team to draw skilled labor, volunteers, and materials from a more competitive market. Preservation projects within these larger communities mostly deal with buildings originally constructed from manufactured materials, such as bricks and milled lumber. They are able to withstand the elements for longer periods of time and require less maintenance and more opportunities for interaction. Principles in the collection of information such as historical documents, on-site research, and, if available, oral histories and interviews of those who lived in or were involved in the home’s construction and design, apply to both rural and urban settings.² The major differences between urban and rural preservation are that in urban settings interactions with organizations, such as city planners, code and regulation committees, housing authorities, and architectural firms require more technical skills in their management and can take up a majority of the time spent in pushing the process through.³ In rural settings much more time goes into the logistics of the project, like food preparation for the field, equipment and safety procurement, facilities management, and room and board for the volunteers.⁴

This chapter is not intended to be a complete guide to the restoration or preservation of earth homes. Suggestions put forth are often far out of reach due to limited funding and a short

¹Norman Tyler, Ted J. Ligibel, and Ilene R. Tyler, *Historic Preservation: An Introduction to its History, Principles, and Practice*, second edition (New York: W. W. Norton & Company, 2009), 294.

²*Ibid.*, 202-12.

³*Ibid.*

⁴*Ibid.*, Tom Isern and Suzanne Kelley, interview by author, Fargo, March 30, 2018.

supply of volunteers. It should be considered more likely a tool to inspire ideas and create a discussion on how to approach the preservation of earthen structures. These suggestions derive from field research and experience in the construction trade, as well as my observation and participation in the preservation of the Hutmacher farmstead in southwestern North Dakota. The preservation of the Hutmacher farmstead is important not only for future generations, but for preservationists to learn from and develop techniques best suited for these vernacular structures. With no standard template to follow, the Hutmacher preservation project is a learning process, requiring compromise and an adaptive approach to the ever changing environmental conditions of the plains.

The threat to earth structures is much higher than buildings constructed of manufactured materials. Their erosion rate is much faster, requiring new strategies to be developed in their preservation. Their location, often in isolated areas of farmland and cattle pastures, puts earth structures in a more vulnerable situation. The survival of any earth home requires constant interaction. If left abandoned, earth homes are susceptible to spring melts, which would weigh down the roof causing failure of the rafters, and cattle rubbing on the exterior walls would have a devastating effect on the home. The encroachment of industries and urban sprawl can present new threats to earth structures. The addition of highways and increased traffic within close proximity of the earth structure can produce vibrations that the earth home was never intended to encounter. Even the Ruud home, which had a thick exterior cement plaster, was no match for cattle and their incessant need to scratch. The Ruud home is an example of what can happen to an earth structure when left unprotected on grazing land.



Fig. 7. Remains of Ruud Sod Home 2010. Photo by Karl Larson.



Fig. 8. Remains of Ruud sod home 2016. Photo by author.

When dealing with the preservation or restoration of earthen structures it is often times the simplest solutions that are the most sound. The nation's first national monument, the fourteenth-century Casa Grande ruins in Arizona, was the recipient of the "first federal funding

ever allocated for preservation.”⁵ The appropriation funds went toward structural restoration. In later years a ramada was placed over the structure to protect it from the heavy rains during the monsoon season.⁶ The McCully sod home, built by Marshall McCully in 1894, currently resides in its original location.⁷ The home was in use until 1963 when it was acquired by the Oklahoma Historical Society.⁸ It has been completely covered by another structure eliminating any contact with outside elements.⁹ The Dowse sod home that is located ten miles outside of Comstock in Custer County, Nebraska, is exposed to the elements.¹⁰ The Dowse sod home was occupied from 1900 to 1959.¹¹ The home sat empty until 1981 when descendants decided to restore the home.¹² Much like the home of Jalmer Ruud, the Dowse sod home is protected by a shake roof and plastered exterior walls.¹³ Each of these examples is a sound solution to protecting earth structures.

The question still remains as to whether or not there is a way to preserve and restore an earth structure in its natural state, or better yet, an entire farm of earthen structures. The Hutmacher farmstead is not located within the close proximity to available resources. The buildings are protected by a fence which keeps the grazing cattle at bay. Other than that, the buildings are left to fend for themselves against the elements and the changing environment. The North Dakota oil boom has introduced new threats to the homestead that must be taken into account when considering the methods that will be used in its preservation. The Hutmacher

⁵Norman Tyler, Ted J. Ligibel, and Ilene R. Tyler, *Historic Preservation: An Introduction to its History, Principles, and Practice*, second edition (New York: W. W. Norton & Company, 2009), 31.

⁶Ibid.

⁷Oklahoma Historical Society, <http://www.okhistory.org/sites/sodhouse.php>.

⁸Ibid.

⁹Ibid.

¹⁰United States Department of Interior, National Register of Historic Places Inventory-Nomination Form, D. Murphy, April 1986, accessed November 2016 from http://www.nebraskahistory.org/histpres/nebraska/custer/CU00-051_Dowse_Sod_Hse.pdf.

¹¹Ibid.

¹²Ibid., <http://www.onlyinyourstate.com/nebraska/dowse-sod-house-ne/>

¹³Ibid.

complex takes preservationists into uncharted territory, forcing them to consider the use modern materials and advancements in technology while still maintaining the historical integrity of the home.

In 1979 the Hutmacher complex was listed on the National Register of Historic Places. Since its listing it changed ownership several times until it was finally deeded to Preservation North Dakota (PND). In 2002, then executive director of PND, Dale Bentley, first laid eyes on the site and the initial planning began.¹⁴ Bentley saw the Hutmacher site as an opportunity to educate people on earth buildings. Bentley recruited Steve Martens, architectural historian at North Dakota State University (NDSU), and his students to do a field research study.¹⁵ With the aid of the Dunn County Historical Society, the State Historical Society of North Dakota, and Martens, Bentley collected historic photos, gained field support, and wrote and obtained grant support from the Kaplan and Bush Foundations.¹⁶ Bentley utilized this grant money and hired Edward Crocker, an independent architectural conservationist with years of experience in consulting and restoring earthen structures in the southwest, to consult in the restoration of the home.¹⁷ By 2007, with the aid of a grant from Save America's Treasures to PND, the process of preserving the Hutmacher complex began.

One of the key issues in the process of preserving an earth structure is that it is labor intensive. To combat this issue, a field school designed by Tom Isern, history professor at NDSU and director of Center for Heritage Renewal, in collaboration with PND's then president, Suzzanne Kelley, led students in the study of earthen structures on the North Dakota plains. The

¹⁴Stefanie Briggs, "A Diamond in the Rough," *Dickinson Press*, 22 July, 2007. Accessed September 7, 2017 from https://library.ndsu.edu/grhc/history_culture/arch/hutmacher4.htm

¹⁵Jo Ann Winistorfer, "Hutmacher Complex Homestead with a History," *North Dakota Living*, May 2011, 38-39.

¹⁶*Ibid.*

¹⁷Edward Crocker, "Strategy for Treatment of Roof, Mortars, and Exterior Render, Hutmacher Farm, Killdeer North Dakota," Crocker LTD, 2007.

class offered students an opportunity to visit and study these vernacular structures as well as to aid in the restoration of the Hutmacher farm. It also provided the needed, able-bodied volunteers for the labor-intensive project at hand. The summer classes have led to a better understanding of what works and what does not work when attempting to restore earthen structures on the plains.

In an interview, Isern and Kelly discussed the trials and errors they encountered in the Hutmacher project, as well as what it takes to organize such a project in a rural setting. Isern and Kelley, due to their extensive interactions and years of involvement in the preservation of the Hutmacher complex, can be regarded as two of the more experienced individuals in the organization and application of rural nineteenth-century earth home preservation. Due to the rural setting and isolated location both Isern and Kelley were initially worried about things getting stolen from the site. Kelly stated that “everything brought in had to leave.”¹⁸ The list was long: “toilet paper, first aid kit, garbage bags, tools... everything,” had to be hauled in a trailer to the site.¹⁹ Food, snacks, water, and what could be cooked over a fire for lunch was hauled in the truck. Materials for the project were gathered locally. Other than some of the ridge beams being delivered, the choke cherry was harvested from the neighboring farmer’s ravines and the clay was taken from the west side of the complex.

Housing originally began at a hotel in Dickinson, but interaction with volunteers/students became difficult in the evening hours.²⁰ Room arrangements were later made with Assumption Abbey, a monastery in Richardton, to provide two-person rooms in more of a barracks style setting with a kitchen and common room. This allowed greater interaction between volunteers, students, and instructors, as opposed to the separate rooms in the hotel.

¹⁸Tom Isern and Suzanne Kelley, Interview by author, March 30, 2018.

¹⁹Ibid.

²⁰Ibid.

The isolated location also brought about some concerns involving emergency needs if they arose. Prior to the outing a list of proper attire was sent out to all of the volunteers.²¹ If medications or epinephrine shots were needed they had to be brought to the site. Because the closest medical help was in Dickinson, just over twenty miles away, extra caution was taken during the outing to ensure safety. Alexander Hutmacher even stated that when growing up on the farm the children “played with a little more caution knowing that the doctor was a ways away.”²²

Many of the methods used in the restoration of Hutmacher buildings today derived from Edward Crocker’s original visit in 2007. Crocker’s extensive research with adobe construction led him to borrow methods and mixtures from the Hopi tribes.²³ The addition of short cuts of straw and the method of application in which throwing handfuls of mixture against the walls then pressing with the palms of your hands were two such examples borrowed by the Hopi.²⁴ The addition of lime to the mortar and the exterior render were added to aid in the adhesion of the mixture to the stone.²⁵ Samples of different mixes were placed on the west wall of the granary in order to find proper combination of ingredients allowing for the most pliable application.²⁶

Crocker also consulted in the development of the roof mixture. A test panel was laid on the north side of the east end of the house. Once again, Crocker borrowed methods from an “earthen roof in the Hopi village of Oriabi in Arizona.”²⁷ Crocker’s method consisted of six components designed to work together: structural, brush, thatching, waterproofing layer,

²¹Ibid.

²²Alexander Hutmacher (b. 1950, Dickinson, North Dakota), interview by Andrea Mott, video recording, Dickinson, North Dakota, 22 June 2009, Dakota Memories Oral History Project, North Dakota State University Libraries, Germans from Russia heritage Collection, Fargo, North Dakota.

²³Edward Crocker, 2007.

²⁴Ibid.

²⁵Ibid.

²⁶Ibid., 7-10.

²⁷Ibid., 13.

retention layer, and resistance layer.²⁸ The waterproofing layer consisted of yellow clay and applied immediately over the thatching in a 1-inch to 1-1/2 inch layer.²⁹ The retention layer was intended to “absorb, hold, and slowly release a large amount of moisture,” and was applied approximately 5 inches thick.³⁰ The final layer, the resistance layer, was then applied directly over the retention layer approximately 4 inches thick.³¹ The test panel was also a success and was later used in the completion of the roof on the main house, the granary, and the garage/summer kitchen. Later, scoria rock was added to top layer to help keep the mixture in place. However, it did not take long before the harsh winters took their toll and issues regarding structural integrity of the roof began to emerge.

Crocker gave credibility to the preservation of the Hutmacher project; however, where he fell short was in his attempt to introduce, with a certain degree of modification, a building method designed and perfected for a specific environment. His attempt to apply southwestern techniques of exterior plaster to a northern environment did not bode well over time. Isern suggested to Crocker that they add bovine manure to the mix, but Crocker stated it was taboo in southwestern building traditions.³² Over time Isern and Kelley began to recognize what would and would not work in Crocker’s plan. The recipe for the plaster mixture designed by Crocker was adjusted to include manure and eliminate sand and straw. As seen in the sample tests, enough straw already exists in the manure.³³ Isern stated that the original mix never really stuck.³⁴ The only mention of the exterior walls in the Dakota Memories interviews is by

²⁸Ibid., 13-17.

²⁹Ibid., 16.

³⁰Ibid.

³¹Ibid.

³²Tom Isern and Suzzanne Kelley, Interview by Author, Fargo, March 30, 2018.

³³Larry Swenson, North Dakota State Soil Testing Lab (Fargo, ND) October 4, 2016.

³⁴Tom Isern and Suzzanne Kelley interview.

Alexander Hutmacher, who stated that there “was little maintenance on the [exterior] walls.”³⁵ Alexander’s statement argues that the correct method was the one that was originally applied.

The technique that Crocker applied to the reconstruction of the roof was specifically adapted to a southwestern climate. The Hopi tribes would have spent years perfecting their mixture and application methods through trial and error. As environmental conditions reacted with their techniques, mixtures and methods would adapt and change until a workable application was found. The Arizona climate is dry most of the year with sporadic heavy rains during the monsoon season. The dry climate, coupled with the heat, quickly evaporated any moisture left in the roof. The summer temperatures on the northern plains can get excessively hot and the roof would have reacted in the same manner as expected. However, the winter months added additional snow weight to the roof, and the slow melt in the spring caused Crocker’s retention layer to absorb more moisture than it was originally intended while releasing it at a slower rate. To counteract this problem, it is possible that if someone was residing in the home and the interior was heated, it may have evaporated the moisture from the inside out. The heat could keep the waterproofing layer warm enough to keep it dry and able to serve its original purpose. With someone living in the home it can also be assumed that the heavy snows would be removed from the roof. This would keep the weight down to a manageable degree in order for the original structure to hold.

The third element is an outside issue that has led to my belief that an entirely new structure must be built to hold up the earth roof. That complication is the vibrations caused by the oil trucks that consistently pass by the site. Two holding ponds that have been recently constructed adjacent to the farmstead will only increase the traffic and the vibrations.³⁶

³⁵Alexander Hutmacher (b. 1950, Dickenson, North Dakota), interview by Andrea Mott, 22 June 2009.

³⁶Tom Isern and Suzanne Kelley, interview by author, 2018.

Originally, it was thought that applying corrugated roofing or a rubber membrane over the existing roof structure would be enough to keep the moisture at bay and the weight down. The vibrations have created new issues in the structural integrity of the roof, issues that the roof was never designed to handle.

In his assessment of the Hutmacher farmstead Crocker argues that all of the six elements in the Hopi design would have to work together in order for the roof to work as intended.³⁷ This is the same concept that is utilized in the modern construction of roofs. Engineered trusses are designed to transfer the majority of the load to the exterior walls in a downward direction. It is the responsibility of the webbing within the trusses to transfer this weight. The sheeting component ties the rafters together creating one unit and at the same time dispersing weight perpendicularly from one truss to another. In certain applications the runners are tied together by placing a board (catwalk) perpendicularly through the trusses also aiding in the weight transference much like the sheeting. This creates a single, independent unit, where weight is broadly distributed regardless of where it is applied.

The structural components of the Hutmacher roof are separated into several independent units that are not working together. The only two sections of the roof which are tied together are at the top of the rafters where they are secured to the ridge beam.³⁸ The lower section of the rafters rests on the outer wall; therefore the ridge beam is carrying the majority of the weight. When the ridge beam begins to sag the rafters put outward pressure on the wall. Welsch describes this as an example of the absence of a chord or runner.³⁹ The runner would transfer the outward pressure downward. The runner is best utilized running from the top of one wall to the

³⁷Ibid., 13.

³⁸ Modern methods of stick-framing a roof attach the individual rafters to the side of the ridge beam, not over the top. This forces the individual rafters to lean against each other, relieving the ridge beam from much of the weight.

³⁹Welsch, *Sod Walls*, 69.

other, tying the lower sections of the rafters together and keeping them from spreading.

However, with the low-lying ceilings of the Hutmacher home a wall-to-wall runner would drop the ceiling too low. The runner could be placed one foot below the ridge beam. It is not the ideal location but it would alleviate some of the outward pressure.

The inconsistencies in the rafters' sizes and strengths also carry some responsibility in the roof collapse. Without knowing exactly which rafter is stronger than another, several weak rafters could be inadvertently placed next to each other, creating a weak link in the roof and requiring the stronger rafters to carry a heavier workload. The willow branches that are placed perpendicularly over the rafters act in a similar manner as sheeting would on a modern home. The difference is that they are not attached to the rafters; therefore, they do not disperse the weight as well as they could if they were attached. This problem might be addressed by attaching purlins about twelve inches apart, perpendicular to the rafter prior to adding the willow branches. These purlins would need to be part of the roof structure in the event that corrugated roofing was added to the roof.

In the most extreme case, manufactured trusses could be used in place of the rafters. The use of manufactured trusses would eliminate not only the rafters, but the ridge beams as well. In this particular situation a scissor truss could be used consisting of webbing that would disperse the weight of the roof to the walls. Scissor trusses can be engineered in a variety of ways. To maintain the low profile look of the Hutmacher farmstead the pitch could be kept at a 4/12 while the vaulted ceiling could consist of a 2/12 pitch; retaining the interior vault of the home. Depending on the materials used in covering the exterior of the roof, either purlins or plywood could be used to tie the trusses together. The compromise that would have to take place and the only noticeable difference from the exterior would be that the overall height of the building

would grow by approximately twelve inches. This is mostly due to the location of the window on the east gable and lower pitch of the interior vaulted ceiling. This compromise is only an approximation; this was never a consideration prior to the vibration issues so proper measurements have not been taken. There are a variety of ways that these trusses could be built that may eliminate some of the height adjustments.

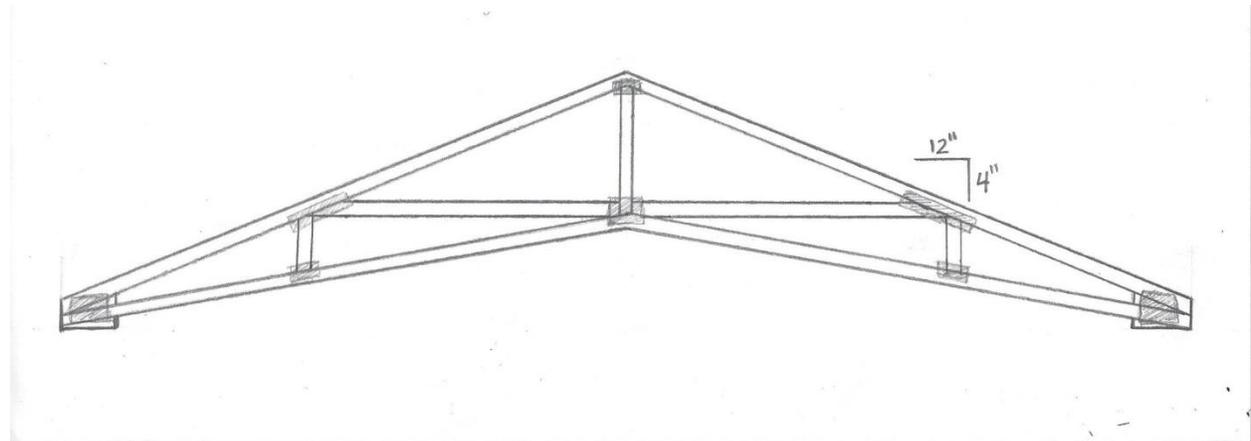


Fig. 9. Author rendering of scissor truss.

The trusses themselves would be purely an internal fix that would most likely solve the problems related to the vibrations. If executed properly, the exterior aesthetics of the buildings would remain the same. By placing the trusses on the stone wall, the inconsistencies in the plane of the roof will remain. The tails of the trusses could be cut off and replaced with the same small cottonwood trunks used in the construction of the original roof and twelve-inch cuts of ridge beam could be attached to the trusses closest to the east and west gable ends. From an exterior view, this would give the appearance of existing original ridge and rafters. The interior would be covered in the same material as it originally was and attached using canning jar lids and nails. This idea is most likely of the blasphemous sort for preservation purists; however, if done properly, the aesthetics of the Hutmacher farmstead would remain the same as they did when the home was in its prime.

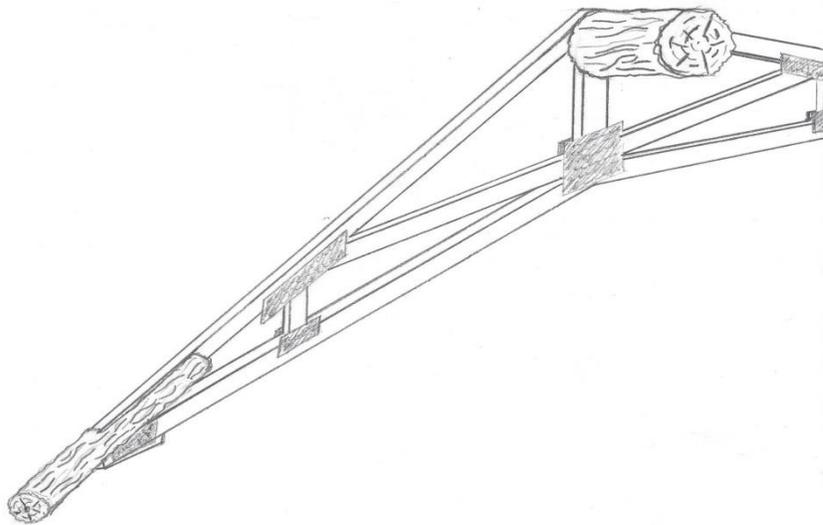


Fig. 10. Author rendering of manipulated scissor truss.

Regardless of what type of structural component is used to frame the roof, it would make sense to reduce the weight of the covering if at all possible. Earth roof, also known as live roof or green roof, technology has come a long way since the Hutmacher home was built. There are various ways to build a green roof, but with further research it could lead to a better understanding of the Hutmacher roof. There are generally three types of green roofs, extensive, semi-intensive, and intensive.⁴⁰ The extensive design is mostly used for herbs and a limited number of grasses.⁴¹ The semi-extensive design would be the covering of choice because local grasses could be used. It has about the same thickness as the current covering of the Hutmacher home; however the weight would most likely be less because of the materials used to retain and shed water.⁴² The intensive design will do little for weight reduction due to the fact that it can get up to twenty four inches thick.⁴³ Even if one of these designs was not adaptable to the Hutmacher

⁴⁰Jörg Breuning & Green Roof Service LLC., “Green Roof Technology: Form and Function,” WSI Web Specialist, 2017, accessed September 13, 2017 from <http://www.greenrooftechology.com/green-roof-types>

⁴¹Ibid.

⁴²Ibid.

⁴³Ibid.

roof, the materials used to retain the soil, collect water, and keep the roots at bay may come in handy when it comes time to replace the covering.

The roof constructed for A&C Systems, a company located in Hoegaarden, Belgium, is a good example of the type of roof that may work on the structures of the Hutmacher complex.⁴⁴ The roof is 3,229 square feet consisting of a low 4/12 pitch roof similar to that of the Hutmacher home, which is covered with a thin membrane and 4.3 inches of soil.⁴⁵ Local “drought-resistant sedum varieties” were used as vegetation.⁴⁶ A semi-extensive design similar to the A &C Systems building is the right fit for the Hutmacher home. It would maintain the structural integrity of the roof, allowing longer intervals between maintenance cycles, and providing a safe environment for volunteers, preservationists, and visitors.

With no standard template to follow, the Hutmacher complex has become an important tool for professionals, volunteers, and students; a tool available for future generations to learn from, requiring compromise and an adaptive approach in its restoration. The failure of the roof and the encroachment of outside elements present an opportunity for those who have spent countless hours in organizing and working on the structures. It opens the door for discussion and gives students, across a variety of academic fields, the chance to study and give their input on the best way to approach its preservation.

It creates moments of hands-on experience for those who volunteer their time and hard work. It will be some time before the Hutmacher farmstead is complete. Hopefully, the restoration period will bring to light better ways of restoring these vernacular structures.

⁴⁴Chrisman, Siena, ed. *Green Roofs: Ecological Design and Construction*, Earth Pledge Green Roofs Initiative (Atglen: Schiffer Publishing Ltd., 2005), 34-35.

⁴⁵Ibid.

⁴⁶Ibid., 34.

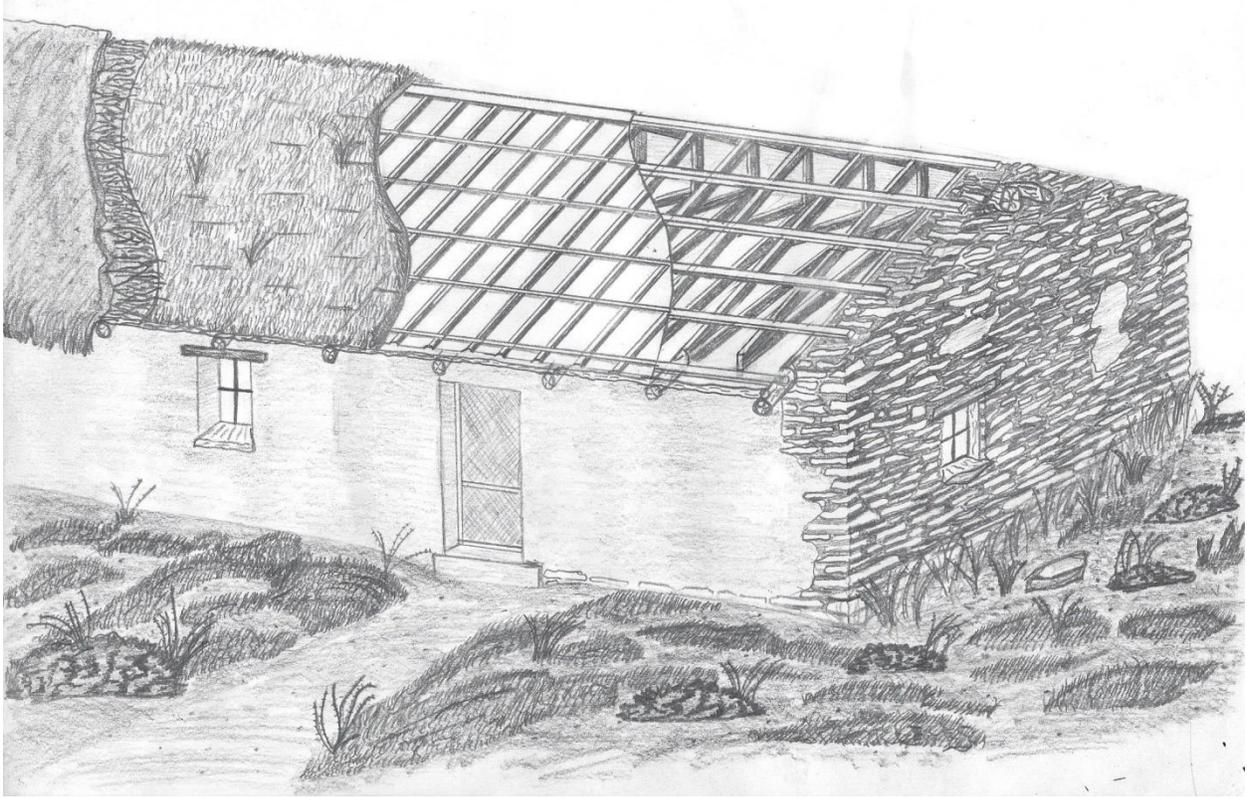


Fig. 11. Author rendering of possible roof options (Earth/Sod/Corrugated metal/scissor trusses).

CHAPTER FIVE: CONCLUSION

“The study of vernacular architecture, through its urge toward the comprehensive, accommodates cultural diversity. It welcomes the neglected into the study in order to acknowledge the reality of difference and conflict.”¹

~Henry Glassie

The earth home is symbolic in the development of the American plains. Its cost-effective materials, simplicity of design, and formidable structure made the late nineteenth-century earth home the “dominance of contemporary fashion” on the plains.² Everett Dick states that the sod houses of McPherson County, Kansas, were “in vogue” in the 1870s.³ The popularity of these homes passed as technology and railroads became more accessible to those residing on the plains. As the historiography of the Great Plains began to build, these once popular earth structures were overshadowed by social histories, and they became more of a backdrop than a central point of research. Earth home research has focused more on ethnic groups and design layouts, solidifying the train of thought that these homes were simply a fleeting method of building.

Great Plains scholars, looking ahead to contemporary building methods and advancements in technology, labeled the earth home as a temporary structure or oversimplified their methods and use: “Many immigrant ethnic groups did produce some of what they had known at home, because that was all they knew.”⁴ What is not taken into account is that many of these groups, including the three case studies in this thesis, did begin with traditional methods

¹Glassie, 230.

²Fred B. Kniffen, *Folk Housing: Key to Diffusion*, taken from *Common Places: Readings in American Vernacular Architecture*, eds. Dell Upton and John Michael Vlach (Athens: University of Georgia Press, 1986), 11.

³Dick, 112-113.

⁴Dell Upton, ed., *America's Architectural Roots: Ethnic Groups that Built America* (New York: John Wiley & Sons, Inc.), 9.

but adapted to their surroundings and the materials available to them. Glassie cites Upton when discussing this void in the study of vernacular architecture in the following statement.

[T]he nineteenth century has been studied less well than the centuries that precede and follow it. One reason is that scholars seem to believe that the directions apparent in the eighteenth century continue through the nineteenth. Another is that, with the nineteenth century, there is a sudden flood of paper with words printed on it, and historians can relax at home, reading written texts that are easy to understand instead of the architectural texts that give them fits.⁵

It is ironic that either Glassie or Upton would phrase the above statement the way they did, considering that it is those who have been academically trained in the study of architecture that have brushed over the study of earth homes and their material culture. However, they do make a point when it comes to the discussion of earth homes within Great Plains literature and it revolves around Robinson's theme of "remoteness."⁶

Up until the mid-nineteenth century, the Great Plains was seen as a vast desert-like region unfit for cultivation and uninhabitable by "civilized men".⁷ Webb argues that the basis for this fictional identity began under Spanish explorer Francisco Vásquez de Coronado in his description of the plains as "uninhabited deserts" and his belief that the Indians wanted to leave him and his men to starve.⁸ Hernando de Soto, another Spanish explorer, turned away when he came upon the plains because he believed he was entering a land "where in Indians wandered like Arabs."⁹ Under President Thomas Jefferson's authority, Zebulon Pike and Stephen Long were sent on expeditions to explore the regions of the newly purchased Louisiana Territory. Pike viewed the plains as a place "incapable of cultivation," a place "where the wind had thrown up the sand in all the fanciful form as the ocean's rolling wave, and on which not a speck of

⁵Glassie, *Material Culture*, 334-36.

⁶Robinson, *History of North Dakota*

⁷Webb, *The Great Plains*.

⁸Ibid, 153.

⁹Ibid.

vegetable matter existed.”¹⁰ However, Pike saw this vast, desert-like region in positive terms as well. He believed it created a barrier of sorts that would contain those “citizens being so prone to rambling and extending themselves” on the frontiers, therefore strengthening the Union.¹¹ It was Long who originally coined the phrase “The Great American Desert,” which led to the Great Plains being seen as more of an obstacle, rather than a destination.¹²

Within this vast plains region is where we find our earth homes; they are remotely scattered among grazing pastures, cultivated fields, and prairie grasses. Field research requires out-of-the-way travel for anyone attempting to study these buildings. When the buildings themselves are not significant enough to warrant this type of travel or effort, it is often the case that the individual will simply resort to citing the works of those who have already written about the topic. This hinders the overall development of future study of the Great Plains and has led to the earth home being continually labelled as a temporary form of shelter among nineteenth century literature on the plains. With the exception of the surveys, most scholars use secondary sources in their discussion of earth homes, while those who are trained in the study of architecture write the earth home off as rudimentary and archaic. This is not unusual, considering that most of literature written on the Great Plains places the earth home as a backdrop to social and cultural histories.

Ronna Lee Widner, in her master’s thesis titled *Sod Houses of Rawlins County, Kansas*, describes another reason why the study of sod homes has fallen short of separating temporary and permanent structures.¹³ Widner cites Warren A. Roberts’s research on log homes in Indiana, stating that “Roberts contends that while both types of architecture did exist, there has been a

¹⁰Ibid., 154

¹¹Ibid., 156.

¹²Ibid.

¹³Widner, 156.

failure to separate the temporary log shelter from the hewn-log house constructed to serve as a permanent home.”¹⁴ This relates to earth homes as well, due to the fact that most earthen structures have been categorized in Great Plains historiography as temporary shelters. The dug-out and the earth home covered in plaster are two very different buildings. Widner goes on to say that “the number and complexity of tools required to construct a log house demonstrate that pioneer life was less simple and crude than once believed.”¹⁵

Field research and the examination of the material culture in the Gregory, Hutmacher, and Ruud homes support this idea that these homes were neither simply built nor temporary. All three homes exhibit the skills of the builder and the use of multiple styles of tools in their construction. The intricate cuts in the rafters and the siding of the Gregory home reveal that the builder was familiar and knowledgeable in working with milled lumber. The center post in the Hutmacher home displays ingenuity and skill of the builder thorough the use of available materials. Finally, the Ruud home reveals a combination of the two. Familiarity of working with milled lumber in the construction of the roof and how it ties in with the sod walls tells of an experienced builder. These case studies are examples of earth structures built with the intention to last.

The Hutmacher and Gregory homes were built using traditional methods and the Ruud home was constructed in a more adaptive approach. However, all three homes show signs of adaptation. This challenges the idea of a pure traditional building method being carried over from any ethnic group’s homeland. Sherman, who extensively studied German-Russian vernacular architecture, states that “[a]s it is difficult to separate the ‘German’ from the ‘Russian’ in the study of Russian-German housing forms, so also, it is difficult, at this distance in time, to

¹⁴Ibid.

¹⁵Ibid.,157.

distinguish the ‘Russian-German’ from the early American.”¹⁶ Sherman asks, “What precisely did the early Germans bring from Russia and what might have been acquired through the observation of their non-German neighbors on the American frontiers?”¹⁷ Sherman uses the example of the earthen roof, stating that “dozens of national groups” prior to the arrival of the German-Russians constructed earthen roofs “laced with cottonwood rafters and willow sticks and then covered with straw and dirt.”¹⁸

It could be that traditional building, when relating to earth structures, was more of an initial plan of construction, a foundation to start from. Changes can be made to allow for the availability of materials and the economic status of the builder. Gregory used milled lumber in the majority of his home, but when it came to the foundation (the posts), Gregory did not want to risk getting bad wood from the mill; he harvested his own posts. He also used modern technology when it came to constructing his home, but as we saw in the lattice, he harvested materials as needed. The basis was to form a structure using traditional skills and incorporating them with available materials.

In the photographs taken by Sherman during his research in Eastern Europe and Russia, homes built in the same manner as the Hutmacher home are found in Fyodorivka, Russia.¹⁹ The buildings have a low profile but the roofs are made of some type of thatching or shingle. Another photo shows the roof covered in sod.²⁰ This area is about fifteen hundred miles from where Valentin Hutmacher was born.²¹ Looking through the hundreds of photos taken by Sherman, this

¹⁶William C. Sherman, “Prairie Architecture of the Russian-German Settlers,” afterward in Richard Sallet, *Russian-German Settlements in the United States*, trans LaVern J. Rippley and Armand Baur (Fargo: North Dakota Institute for Regional Studies, 1974), 193-94.

¹⁷Ibid., 194.

¹⁸Ibid.

¹⁹German from Russia Heritage Collection, Photos from the Sherman research trip are still being uploaded to the Digital Horizon Collection at North Dakota State University Libraries.

²⁰Ibid.

²¹Valentin Hutmacher, *Homestead Papers*. 1912.

is the only location where the homes resemble the buildings on the Hutmacher complex. The majority of the other photographs show houses built in the more common styles of German-Russian building using batsa brick.²² It is possible that Valentin had knowledge of several ways in which the German-Russians constructed their homes and then applied the one best suited for the location of his homestead; Frank simply followed suit.

There are three basic traits that distinguish earthen homes built as temporary structures and those built with intent. The first trait is in the use of an exterior plaster or siding. In *Dakota Circle: Excursions on the True Plains*, Isern argues that “stucco is the plainsperson’s answer to adobe. Builders on the plains kept their traditional architectural designs, but changed the exterior to stucco.”²³ Isern’s reference to stucco can be broadly applied to any form of exterior coating used to seal or protect the interior from high winds, cold temperatures and erosion, and also to significantly reduce rodent infiltration. The Ruuds used a type of stucco Isern is referring to. The Hutmachers used local materials in their exterior plaster mix, while the Gregorys continued their use of milled lumber and manufactured materials. It is this exterior coating that can be used to initially identify earthen structures built as permanent dwellings.

The second trait in identifying a permanent earth structure is to determine whether or not the home has had additions, or if any other work has been done on the original home. All three case studies show irrefutable evidence that additions have been made to the homes. The Gregory home shows signs through the existence of a thicker interior wall, where the addition was added. Intricate cuts in the siding intended for a specific purpose is described as a “ghosting feature” and identifies a feature of the home that no longer exists.²⁴ The Hutmacher home also has interior walls that once acted as exterior walls prior to an addition. The hand-crafted center post

²²Sherman photographs.

²³Tom Isern, *Dakota Circle: Excursions on the True Plain* (Fargo: Institute for Regional Studies, 2000), 121.

²⁴Tyler et al., 208.

is a unique feature in the Hutmacher home. The way in which the center post was created suggests that it was an important part of the structure. The Ruud home has the most obvious addition, its kitchen; however, the use of several different techniques and materials on the inside of the home suggest that work was done at one or more points during the life of the home.

The final trait is to identify the length of time the earth structure was occupied. Records show that all three homes in the case studies have been lived in for approximately forty years. This information is found in primary and secondary sources associated with the homes themselves. The homestead records identify when the original home was constructed as well as the outbuildings that were built to prove up the homestead. In many instances, such as in the Gregory homestead, the outbuildings have been torn down or have eroded, which can be determined through field research. The Ruud home is the only home that was rented out after the owners moved out.²⁵ In the Hutmacher case, oral histories and interviews with those who resided in the home are available, supporting the idea that the home was built with intent.

After listening to the oral histories a very interesting comment was made by Alexander, the youngest of the Hutmacher family. Alexander stated that the Hutmacher home was originally intended to be temporary until they could build something else, but then the “dirty 30s” came and they had no crops and little money.²⁶ He said he remembers his father, Frank, saying, “Well, if I lived in this all these years, I might as well finish my life here.”²⁷ Over time, as the home became popular with tourists, Alexander stated that it was kind of neat being a part of something like this.²⁸

²⁵Bernice Larson, Interview by Tom Isern, 1998.

²⁶Hutmacher, Alexander (b. 1950, Dickinson, North Dakota), interview by Andrea Mott, video recording, Dickinson, North Dakota, 22 June 2009, Dakota Memories Oral History Project, North Dakota State University Libraries, Germans from Russia Heritage Collection, Fargo, North Dakota.

²⁷Ibid.

²⁸Ibid.

That “something” eventually became an all-out effort by Preservation North Dakota to preserve and to restore the home to its original state. It did not take long for those leading the project to realize that the preservation of an earth structure is unique in many ways. Specialists were brought to do initial surveys and create mixtures that would best suit the preservation project. Over time it was realized that the mixtures that were originally suited for a southwestern climate would not work in this environment and they were addressed and corrected to suit the North Dakota environment. Issues regarding lodging, on-site facilities, and feeding the volunteers also arose, and many changes had to be made in order to accommodate the volunteers due to the remote location. Then modernity caught up with the Hutmacher home. Vibrations from increased traffic due to the North Dakota oil boom created an element that the home was never meant to encounter. Essentially, the Hutmacher home became a moving target. Questions regarding how to properly restore the roof to combat the vibrations came to the forefront. The need to use manufactured materials become apparent and drawing the fine line between modern technology and historical accuracy is leading the discussion. The next steps will be taken with more caution.

The preservation of the Hutmacher home is important because earth homes, even those constructed with intent will eventually erode away. Their susceptibility to outside elements is much higher than that of buildings constructed with manufactured materials. The hands-on experience gained from working with an earth home draws a connection between the builder and the home that is lost when using manufactured materials.²⁹ Some of this experience will be lost with the use of trusses on the home, but much less than expected. The roof will be the only portion of the home that will need an update; everything else will generally remain the same. It is

²⁹Glassie, *Material Culture*, 243.

the hope that by updating the roof, the home will endure the long winters without interaction, requiring less maintenance during the working season.

The preservation attempts on the Hutmacher homestead have not only raised many new questions regarding the practice of preserving and restoring earth homes, it has made those involved aware that the participation in its preservation may be more important than the successful completion of the project. Those involved in the restoration efforts gain knowledge of historic earth building methods through hands-on experience. Interaction with the materials and the environment enriches classroom study and creates a connection between the historic literature on the subject and the individual participating in the preservation of the home.

The study of the material culture of earth homes is important in that it enriches the history of the American plains and those who settled that land. Structurally, the three houses that have been analyzed and described in this paper represent builders who understood what it meant to construct a permanent home. Their techniques reveal traditional and adaptive building styles. This suggests they had a firm grasp of traditions as well as a conscious relationship with their environment. What makes these homes important is that they separate the temporary from the permanent in earth home construction on the plains. This opens up new avenues of research for the earth home and changes how they are perceived.

As of the fall of 2016, all three homes are still standing. It is likely that the Ruud home, much like the Gregory barn, will be torn down, if it already has not been, to ensure that the cattle do not get hurt. It is only a matter of time before the Gregory home succumbs to the environment or scavengers looking for barn wood. The Hutmacher home has a questionable future, but I am hopeful that a solution will be made that will aid in its recovery, and it will be possible that

future generations can take part in its restoration and get a glimpse of what life was like for early settlers of the plains.

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