

HISTORIC CONTEXT STATEMENT

THE BARNs OF LINN COUNTY, OREGON

1845-1945



Linn County Planning Department
1997

The activity that is the subject of this publication has been financed in part with Federal funds from the National Park Service, U.S. Department of **the Interior**, as provided by the State Historic Preservation Office. However, the contents and opinions do not necessarily reflect the views or policies of the Department **of the interior**, nor does the mention of trade names or commercial products constitute endorsement or recommendation by the U.S. Department of the Interior.

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THE BARNs OF LINN COUNTY, OREGON
1845-1945

Mary K. Gallagher

with assistance provided by

Joni Nelson

May Dasch

Pat Dunn

Beth Fox

Philip Dole

Project Consultant

Linn County Planning Department
1997

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May 29, 1998

The Honorable Catherine Skiens, Chairman
The Honorable Dave Schmidt
The Honorable Larry J. Johnson
Linn County Board of Commissioners
Linn County Courthouse - 300 Fourth Avenue SW
Albany OR 97321

PARKS AND
RECREATION
DEPARTMENT

STATE HISTORIC
PRESERVATION OFFICE

Dear Commissioners Skiens, Schmidt, and Johnson:

During its meeting in Portland on May 8, the State Advisory Committee on Historic Preservation reviewed and unanimously approved for nomination to the National Register of Historic Places the exemplary multiple property submission entitled *Historic Barns of Linn County, Oregon (1846-1946)*. The application was prepared under sponsorship of the Linn County Planning Department. Its author was Mary Gallagher, a former Planning staff member. Mrs. Gallagher was supported in her work by the following volunteers knowledgeable about Linn County history: May Dasch, Joni Nelson, Patricia Dunn, and Beth Fox.

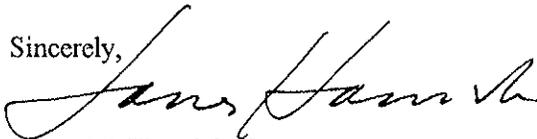
I have been asked to convey to Linn County the State Advisory Committee's commendation for the excellence of its historic resource planning program and for its support of the historic barns research and documentation project in particular. The County's initiative sought to

- 1) classify and evaluate barns of the historic period still standing in the rural landscape, and
- 2) document and register the best examples of each type in cooperation with the property owners.

Thanks to the initial application under the umbrella study, six outstanding barns are now approved for nomination. The way is open for additional barns to be nominated to the National Register in the future.

The recently-completed National Register multiple property submission is the outgrowth of an earlier County-supported project, a detailed historic context study entitled, *The Barns of Linn County, Oregon, 1845-1945*. Together, these efforts were carried out over four years' time and represent a total public investment of more than \$28,000. Half the investment was derived from matching grants-in-aid from the federal Historic Preservation Fund. The studies are an essential step toward increased appreciation and appropriate treatment of the County's agricultural heritage resources. The State Historic Preservation Office is extremely pleased to have been able to assist the County's initiative. Since it is a model applicable to other parts of the Willamette Valley and the state as a whole, we would like to encourage discussion of ways and means of publishing the work for broader circulation.

Sincerely,



James M. Hamrick, Deputy
State Historic Preservation Officer

cc: Steve Michaels, Linn County Planning Director
Linn County Historic Preservation Advisory Committee c/o Michelle Dennis
Alfred M. Stachli, FAIA, Chair, and members of the State Advisory Committee on Historic Preservation
Mary Gallagher
Philip H. Dole



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73410-807

January 6, 1998

Mary Kathryn Gallagher
1430 NW Hillcrest Drive
Corvallis OR 97330

PARKS AND
RECREATION
DEPARTMENT

Dear Mary:

It has been a real pleasure to review your admirable 1997 historic context statement, *The Barns of Linn County, Oregon, 1845-1945*, which you produced for the County on the basis of extensive literature research and field work carried out in 1995-1996. Every credit to you, those who assisted you in the reconnaissance, and your expert adviser for a first-rate document. I hope the State Historic Preservation Office can promote distribution and application of the context on a broad scale, because it truly is a model of its kind.

STATE HISTORIC
PRESERVATION OFFICE

Every aspect of the context shows an intimate acquaintance with the barns of Linn County arising from consultations, interviews, and close inspections even to the deepest recesses, from foundation to rafters, to document the distinctive details of joinery. One immediate and welcome outgrowth of this grant-assisted project is a multiple property submission to the National Register encompassing seven of the representative barn types. Your work is so effectively organized as to make the results of a complex study intelligible to the reader. For my own benefit, I note that within the historic period of significance you have identified four periods of barn design and construction that were affected by varied cultural traditions, technological innovations, mechanization of farming practices, individual builders, attachments and accessories called for by evolving functions and industry standards.

While the status of historic barns in Linn County is cause for concern, since most have been superseded for practical use and few are well maintained, the opportunity for public education offered by this study and the recommendations for action, ranging from video documentary projects and driving tour brochures to strategic professional recordation and creation of a revolving loan fund, are reason enough not to become discouraged. We note that you call for extending the reconnaissance to the little-covered eastern section of the County, the foothills of the Cascades including such areas as Sweet Home; and for moving to the intensive survey level along with contextual studies of the impact of ethnic immigration on Linn County agriculture as well as major shifts in grain growing and livestock raising locally.

The appendices have utility. I noticed that "mowstead" did not make it into your glossary, probably with good reason. You have made excellent use of your photographs, ground plan sketches, framing diagrams, lithographs from Edgar Williams's 1878 historical atlas, and schematic drawings from plan books. The illustrations, together with your illuminating discussions and the chart of features characteristic of the essential sub-periods, will be valuable as an aid to classification of barn types elsewhere in the state. Despite the fact that the lost barns of the county could not be incorporated into the analysis, your context shows that Linn County harbors a remarkably diverse array of barn types and variations. The account you have provided is quite a legacy and, I hope you believe, worth all the sacrifices you made to complete it. You have our utmost appreciation.

Always with good wishes,



Elisabeth Walton Potter
National Register Coordinator

cc: James M. Hamrick
Kimberly Dunn
Phillip Dole
Steve Michaels
Ward Tonsfeldt



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May 1, 1998

Alfred M. Staehli, FAIA
Chair, State Advisory Committee on Historic Preservation
317 SE 62nd Avenue
Portland, OR 97215

Dear Mr. Staehli,

The Historic Resources Commission of Linn County, Oregon is pleased to support the nominations of the following properties to the National Register of Historic Places. The Linn County properties scheduled for hearings at the meeting on May 8 include:

- Historic Barns of Linn County, Oregon Multiple Property Submission
- Stellmacher, Gus and Emma, House and Barn
- Oregon Pacific Railroad Linear Historic District (portions of which are located in Linn County)

We are particularly proud of the Historic Barns Multiple Property Submission, the result of a laborious project sponsored by the Linn County Historic Resources Commission and the Linn County Planning and Building Department. Mary Gallagher, who served as the Historic Resources Specialist for Linn County for a number of years, has done an outstanding job researching the historic barns in Linn County and preparing this Multiple Property Submission for your consideration.

As a way of recognizing the importance of the county's history, we encourage appropriate listings of resources on the National Register. We hope that your committee will find these nominations suitable for recommendation to the National Register.

Sincerely,

A handwritten signature in cursive script that reads "Michelle L. Dennis".

Michelle L. Dennis
Historic Resource Specialist

cc: Elizabeth Potter, State Historic Preservation Office

ACKNOWLEDGEMENTS

Thank you to the farmers of Linn County, for sharing your barns. A special thank you to Roscoe Paine who provided photographs and written information. As usual, my thanks to Kimberly Dunn, Grants Manager at the State Historic Preservation Office whose patience has surely been tested by this project. Thank you Steve Michaels for your confidence.

Philip Dole received little of monetary value from this project but he will have my gratitude and admiration forever.

Mike and Katie Gallagher have been long suffering and at the end of this project I will return to my role as a wife and a mother.

To all of the volunteers, especially Joni Nelson, May Dasch, and Pat Dunn, no words can express my appreciation.

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FINAL REPORT

Work on this multi-phased project was inaugurated on October 1, 1995. Project personnel included Mary Gallagher, project coordinator, and a number of volunteers including Joni Nelson and Patricia Dunn, both Linn County Historic Resource Commission members, May Dasch and Barbara Judge. Philip Dole served as consultant for the project and generously shared his expertise on numerous occasions. Beth Fox, a student intern from the University of Oregon, provided research assistance during the summer of 1997. Lon Tyler, a timber framer from Linn County, accompanied the crew into the field several times.

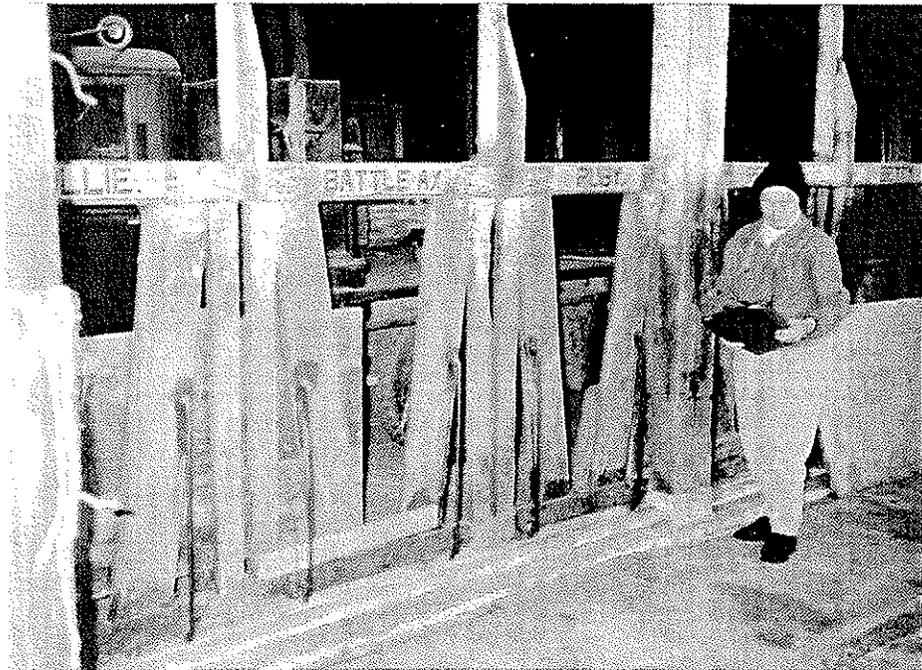
The first phase of the project involved the preparation of a draft historic context statement entitled "Barns of Linn County, Oregon, 1845-1945". This phase, which was primarily a literature review, relied heavily on general information on barn design and construction from books, periodicals, journals, and barn equipment catalogues. Information on Linn County settlement was also reviewed. The information from the draft historic context was compiled as a predictive model for the proceeding survey phase.

The second phase of the project, which began in March of 1996, was a field survey to identify and record barns in Linn County. The survey covered approximately 640 square miles of Linn County focusing on the valley floor, valley foothill interface and tributary stream valleys (See Figure 1). The information provided by the survey was used to refine the historic context statement which was completed in December of 1996. While the results of the survey were used liberally in this historic context statement, it is important to point out that Linn County has lost a large number of barns through the years, and therefore the context does not describe the full range of barn design and construction in Linn County.

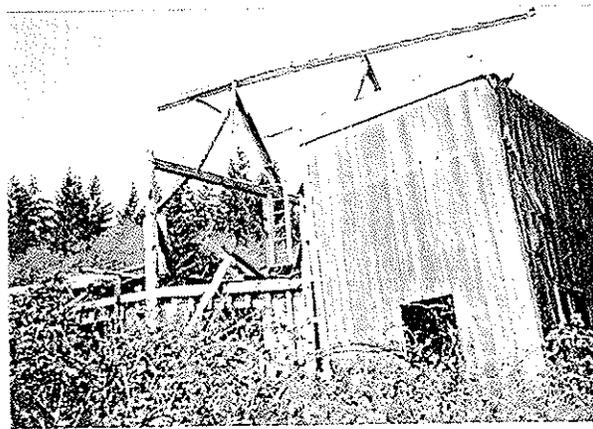
The fourth phase of the project, based on a recommendation of this context, was the completion of a National Register multiple property submission on barns. This submission, which includes seven individual National Register nominations at this time, is anticipated to be completed in late December 1996. The barns nominated at this time illustrate a wide-range of barn construction and design. Nominated barns include the William Cochran Barn, a pioneer era bank barn; the James Alexander Smith Barn, a timber frame horse barn built in 1888; the Michael Ryan Barn, the only Pennsylvania Barn in Linn County, built in 1910; the Aegerter Barn, built for Swiss emigres in 1915; the Macpherson Dairy Barn, built in 1924-25; the Gustavus Milde Barn, a gambrel-roofed barn built by Milde, a local barn builder, in 1929; the Grell Barn, also a gambrel-roofed barn built in 1929.

This product, the historic context statement, is a planning document designed to: provide a better understanding of barn building in Linn County through time; furnish information on the quantity, quality, and condition of barn stock in the county; identify distinctive characteristics and associative values to assist in developing evaluation standards whereby the significance of an individual barn may be assessed; and propose preservation strategies. Four chronological time periods were delineated on the basis of observed trends in barn construction and design. For each of these chronological periods, the historic context provides: an overview of the events

which affected barn design; an identification section which discusses design, materials and workmanship; and an evaluation section which provides guidelines for assessing significance. There is also a chapter on ethnic and religious groups that have lived in the county since some barns may reflect the traditions of these groups. The treatment section proposes preservation strategies designed to be implemented as part of the overall planning program of Linn County.



THE END OF AN ERA



barn n. 1. A large farm building used for storing grain, hay, and other farm products, and for sheltering livestock. [Middle English *bern*, from Old English *bern*, *berern* : *bere*, BARLEY + *ern*, *arn*, place, house...¹

For the first 100 years of Linn County history, from roughly 1847 to 1947, the wooden barn was the most visually prominent and economically important building found on the agrarian landscape of the county. From the earliest Euroamerican settlement, the family farm was the basis of the rural economy in the valley and foothill portions of the county. On these farms, barns were used to store grain, hay and straw; house livestock; process grain; shelter and repair farm implements; and milk cows. Although agriculture is still a prominent factor in the Linn County economy, the past few decades of the 20th century have ushered in changes which are eliminating the wood barn as a symbol of agrarian life. In Linn County, wood frame barns fall victim to expanding urban growth boundaries; changing agricultural products and practices; corporate purchase of family farms; and neglect which is often the corollary of the high cost of materials and labor for the repair and maintenance of a building no longer needed in the farm operation.

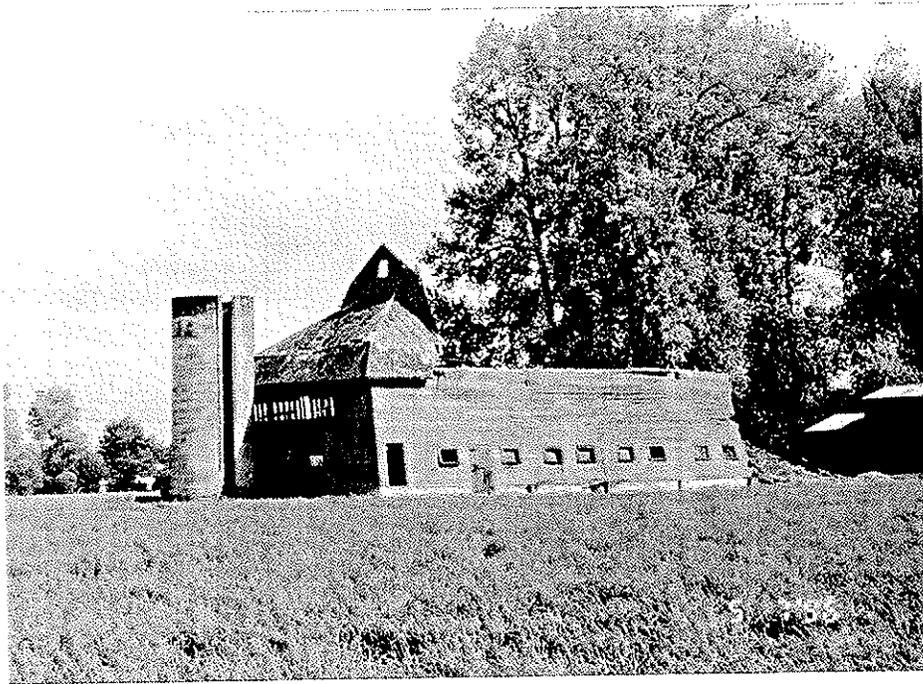
Often the preservation of the barn depends upon the building's usefulness to the farmer. The traditional multiple purpose barn of the early 20th century had low-ceilinged first stories with numerous posts, and high lofts for the storage of loose hay needed in great quantities for the feeding of cows and draft animals. Today, the immense-sized farm machinery which replaced draft animals cannot fit into the low ceilinged first floor spaces. Likewise, hay is often baled or rolled. Older barns may also be deficient in their ability to meet current requirements for sanitation in the livestock industry. Instead, prefabricated buildings of metal are specialized, designed to house farm machinery, hay, or livestock. It has been observed that these new agricultural buildings "...are ushering in a homogeneous leveling of the landscape. Their horizontal appearance is in stark contrast to the perpendicular orientation of earlier generations of barns. Nor do these modern agricultural buildings engender much in the way of design or

¹ Morris, William (ed). *The American Heritage Dictionary of the English Language*. (Boston: Houghton Mifflin Company, 1969), p. 108.

INTRODUCTION

architectural aesthetics. In fact... there is little to distinguish these utilitarian structures from similar buildings constructed in urban areas for commercial use"²

The purpose of this project is twofold; While it is hoped that a study of this type heightens awareness and stimulates the preservation of the wood frame barns, it is likely that many of the barns standing in Linn County as the 20th century draws to a close will disappear in the 21st century. Hopefully, this work will survive as a keepsake for future generations who may never know an agrarian landscape defined in large part by the wooden barn.



² Harper, Glenn A. and Steve Gordon. "The Modern Midwestern Barn, 1900-Present," Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm. (Athens, Ohio: Ohio University Press, 1995), pp. 213-232.

HISTORIC OVERVIEW

Pioneer Agriculture and Stock Raising

By 1850, approximately five years after the first pioneers claimed land within the present-day boundaries of Linn County, there were 138 farms in Linn County.¹ After the construction of a shelter, most early settlers turned their attention to clearing and planting a field of wheat. Several individuals are credited with planting the first wheat in the area, including Isaac Courtney who settled in the Calapooia River Valley in 1846. In 1847, James McHargue purchased the squatter's rights to a piece of land three miles southeast of Brownsville. This land already had "a small log cabin on it and a few acres planted to wheat--perhaps 20 acres."² Robert Earl reports that the Earl family's first wheat was sown in the latter part of May of 1846, the seed having been carried on the back of Joseph Earl all the way from French Prairie to the Earl claim.³ J. Fred McCoy, son of John McCoy, who settled in the Oakville area in 1846, recounts how with a homemade plow and three yoke of oxen, 38 acres of sod land were broken in the spring of 1847:

The first plow used by Him on his pioneer farm, consisted of a wooden moul-board [sic], carved by himself out of a piece of oak wood, the steel lay and land-bar being purchased of the traders at Oregon City. It was stocked with wheels sawn from a tree, with a large one in the furrow and a smaller one on the land to make it level. With this plow and His three yoke of oxen, thirty eight acres of sod was broken and sown to wheat on his new farm.⁴

The land was planted to wheat. Spring wheat varieties could have included Red Chaff, Pacific Bluestem and Chili Club. Winter wheat was also sown but production of spring wheat was greater than that of winter wheat.⁵

At first, these cultivated fields were small, just large enough to raise some "wheat and a little

¹ Olsen, Charles Olaf, History of Linn County, Oregon, Work Projects Administration Writer's Program, Reprinted by L.M. Wheeler, 1982, p. 64.

² Haskin, Leslie L., et. al., "Interview with Catherine Louise McHargue Hume," in Pioneer Stories of Linn County, Oregon, Vol. II, (Albany, Oregon: Linn Benton Genealogical Services), 1984, p. 88.

³ Stewart, C.H., The Earl Family of Linn County, in Leslie L. Haskin Collection, W.P.A. Records, Brownsville Public Library, Vol. 13, p. 17.

⁴ McCoy, J. Fred, "A Biography of John McCoy with a Brief History of Linn County, Oregon," (Albany, Oregon: Richard R. Milligan), March 1983, p. 12.

⁵ Halbakken, David, A History of Wheat Growing in Oregon During the Nineteenth Century, (Eugene, Oregon: M.A. Thesis, University of Oregon), 1948.

BARN DESIGN AND CONSTRUCTION, 1845-1870

garden and oats."⁶ The 1850 U.S. Census indicates that during this early period of settlement, the agricultural development of this region was limited. Settlers lived at the subsistence level, producing enough to meet their own needs, living off of whatever food or livestock they had brought along, and on the plentiful game, while hastily planting such seeds as they possessed and anxiously awaiting the first crop.⁷ Potatoes, swine, and wild game were relied upon heavily.⁸ It is interesting to note, however, that in 1849, Linn County produced 1/6 of the entire state's wheat yield.⁹

Prior to the construction of the R.C. Finley flour mill on the Calapooia River, wheat had to be transported to Oregon City to be ground. Referring to the Earl family's wheat crop of 1846, Robert Earl recalls that "In the fall the product of this seed was reaped by hand, threshed by tramping with horses or cattle, and the use of a flail, and then cleaned by throwing it up in the air. It was then taken by ox team, to the McLaughlin mill, at Oregon City, and exchanged for flour, and eight or ten days were usually consumed in making the round trip."¹⁰

The Earl Family, who lived south of Jefferson, recalled that, "In the fall of 1850, Mr. Dick Findley's mill commenced running. It was on the Calapooia about twelve miles above Brownsville. The trip there with oxen could be made in three days. It was hard looking flour, but beat going to Oregon City."¹¹ The 1850 Census for Linn County, Oregon, Schedule 5, Products of Industry, lists two other gristmills operating at that time, one of which was operated by a member of the Kees family along with a sawmill.¹² The Earl Family noted that, "In the winter of 1852 a grist mill started operating at Albany. From there we could go and come in one day if not delayed waiting in turn, which was often the case."¹³ In the late 1850s, another grist mill was erected on the valley floor. Located in the town of Boston, this location was more central to the expanding agricultural community. Other grist mills dating to this early period were located in Brownsville, beginning in 1858, and Scio beginning in 1856 (McKinney and Turner). According to Albert G. Waggener, "Most business in those days was done by credit or barter. Credit was ordinarily settled when wheat was marketed or when cattle was driven to

⁶ Haskin, Leslie, L., et. al., "Interview with Dorissa Jane Zoosman Miller," in *Pioneer Stories of Linn County, Oregon, Vol. III*, (Albany, Oregon, Linn Benton Genealogical Services), 1985, p. 90.

⁷ Olsen, p. 64.

⁸ Boag

⁹ Halbakken, p. 41.

¹⁰ Stewart, p. 17.

¹¹ *Ibid.*

¹² Tenth United States Census, Linn County, Oregon, Schedule 5, Products of Industry, 1850.

¹³ McCoy, J. Fred, "A Biography of John McCoy with a Brief History of Linn County, Oregon," (Albany, Oregon: Richard R. Milligan), March 1983, p. 14.

market."¹⁴

In the late 1840's and very early 1850's, markets for any surplus crops were limited. Commodities could either be sold locally or carried in wagons to the Willamette River where they could be drifted down river in flatboats or canoes. Road construction, beginning in the early 1850's, and the commencement of steamboat traffic on the Willamette River at that time, allowed farm products to be marketed more broadly. In 1851, the first steamboat made it up the valley as far as Corvallis; by 1856 Eugene City had been reached. Albany, Corvallis, Orleans, Burlington, Peoria, and Harrisburg were local wheat shipping points.

The growth in agriculture in Linn County in the decade from 1850 to 1860 has been described as remarkable.¹⁵ In 1850, Linn County harvested 50,000 bushels of wheat; in 1860, this number had risen to 145,273.¹⁶ This increase can be attributed to population growth and an increase in markets. The 1850 population of 994 had risen to 6,772 in 1860 and the number of improved acres increased from 6,041 to 200,980 during this period.¹⁷ "Altogether the ten years from 1850 to 1860 constituted an era of optimism and expansion in a new country where road-building was increasing, steamboat service growing and transportation as a whole improving."¹⁸ The subsequent decade, from 1860-1870, does not continue this pace of development. While improved acreage actually decreased slightly during this period, "there was an astounding development of grain production. Nearly half a million bushels of wheat were threshed against the 145,273 bushels of 1860."¹⁹ This increase probably reflects the adoption of mechanized threshing.

The amount of land planted to wheat by an individual farmer had been limited by the lack of mechanized equipment for harvesting. Wheat was harvested by hand with a cradle scythe and the harvest needed to be completed within a 10 day period, or even sooner if rain threatened, because the grain would begin to shatter out of the heads.²⁰ Mechanized harvesting equipment included the header and the threshing machine. The header sliced the heads from the plants and forced them into a large bin. The grain heads were then hauled to the threshing location. The header eliminated the need for hand cutting, binding and shocking. In 1868, wheat was shipped

¹⁴ Haskin, Leslie L. et al., "Interview with Albert G. Waggener," Work Projects Administration, Oral History Program.

¹⁵ Olsen, p. 65.

¹⁶ Halbakken, p. 48.

¹⁷ Olsen, p. 64-65.

¹⁸ Olsen, p. 65.

¹⁹ Ibid.

²⁰ Hurt, R. Douglas, American Farm Tools, (Manhattan, Kansas: Sunflower University Press), 1982.

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directly from Portland to Europe for the first time.²¹ By the late 1860's, wheat, oats, and to a lesser extent, barley, were the major crops in Linn County. Oats and barley were used primarily as livestock feed.

Also during this period, "modern" advances in agricultural practices were disseminated by several publications, such as The Oregon Farmer, which circulated from 1858 to 1863. The Morrill Act of 1862 gave rise to the agricultural education movement with the establishment of land grant colleges. The forerunner to Oregon State University, Corvallis College, was designated "the agricultural college of the state of Oregon" by the Legislative Assembly in 1868 so it could accept a grant of land under provisions of the Morrill Act of 1862.²²

Stock Raising

In 1848, gold fever hit the region and women and children were left to care for the crops and perform the harvest as the men in the area left for California. The California gold rush had the effect of changing the economy of the Willamette Valley, providing new markets for surplus agricultural products, individual wealth for some, and a medium of exchange. With the limited availability of labor at the time of the gold rush, many settlers found it easier to raise livestock which was then in demand at the gold fields. The gold rush brought the early settlers of the region into a primitive market economy based on livestock. Between 1850 and 1852, there was an 86 percent increase in the number of cattle per capita in the Calapooia region of Linn County.²³ There were also settlers who had large numbers of hogs, the products of which were also shipped to the mining regions to the south.

Settlement on the valley floor was originally limited because it was believed that the open valley floor was too boggy and wet to ever be cultivated. Instead, the valley floor served as a vast pasture land for livestock. Each settler had a brand or ear mark for his stock and only rounded it up for use or for sale.²⁴ Because of mild conditions, livestock could forage in the valley year round. In 1850 Wilson Blain wrote, "Here the cattle roam at large, summer and winter, asking nothing from the care of man..."²⁵ Like cattle, swine were also allowed to range over the valley, "...feeding on oak mast (acorns) and various roots growing on the prairie-woodland

²¹ Boag, p. 249.

²² Oregon Agricultural Experiment Station, 100 Years of Progress: The Oregon Agricultural Experiment Station Oregon State University 1888-1988, (Corvallis, Oregon: Oregon Agricultural Experiment Station), College of Agricultural Sciences, Oregon State University, 1990, p. 1.

²³ Boag

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edges of the valley."²⁶ Thomas Kendall reported in an 1852 letter that "Our beef and pork are the product of natures wild, unheeded by forced rearing of the sty or the stall."²⁷ He further stated that "Cattle and horses, due to the mild climate, are more satisfied and can forage all year "never call at your barn for a meal."²⁸ Barn-housed cows, however, were kept for milk and cream production; over thirty-seven thousand lbs. of butter and cheese were produced in a single year based on the statistics provided by the 1850 U.S. Census.²⁹

As more settlers arrived in the area and found the best land taken, they began to take claims on the valley floor. "To combat unruly livestock, settlers were forced to enclose their land, especially since the provisional and territorial laws left the legal burden on those who wanted to protect their property."³⁰ In 1856, there was a petition to the Territorial government to "force cattle owners to confine animals running at large and ravaging the petitioners' own "grass claims".³¹ Kim Archie Frum recalled that

"Every so often there would be a sort of round-up. The men would ride out with their lass (sic) ropes and drive the horses up...and run them into a corral. Then they would take their ropes and 'lass 'em' and take them out to break them. Cattle were rounded up too and marketed or butchered. At first all stock ran together but, little by little, the sod was broken up and fenced for grain growing."³²

The gradual fencing of the valley floor was one of the factors responsible for the decline of the livestock industry in the Willamette Valley in the 1860s. In the mid-1860s, the Willamette Valley and Cascade Mountain Military Wagon Road, which provided a route east across the Cascade Mountains, was completed to Central Oregon allowing livestock producers to graze their livestock in the wide open ranges. With the shift of the cattle industry to the east side of the Cascades, the basis of Willamette valley agriculture became wheat farming. The number of horses, however, increased tenfold in the period from 1850 to 1860.³³ This increase probably is a reflection of the expanded population and the escalation of horse-powered farm equipment used in grain production. With the increased horse population, there was also greater acreage

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²⁷ Olsen, Michael Leon. "Thomas S. Kendall's Letter on Oregon Agriculture, 1852." *Agricultural History*. Vol. 9, 1935, pp. 189.

²⁸ *Ibid*, pp. 191-192.

²⁹ Olsen, p. 64.

³⁰ Boag

³¹ Boag, pp. 141-142.

³² Haskin, Leslie L., "Interview with Kim Archie Frum," Work Projects Administration, Oral History Project.

³³ Olsen, pp. 64-65.

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devoted to oat production, with oat production doubling in the decade from 1860 to 1870.

Locally, the foothill regions of the county continued to provide open grazing land since its agricultural potential was limited. Several large producers operated ranches in the foothills. One of the largest cattle ranchers was William Cochran whose ranch was located north of Brownsville. Cochran "ran his cattle on the open range in the hills east of here. They had clear range as far as the town of Sweet Home (16 miles)."³⁴

Many of the early settlers also raised sheep. At first, wool was spun at home and used primarily for family clothing. In the early 1860s, a woolen mill was established in Brownsville providing a local market for sheep wool. Carding mills were established in Crawfordsville and Boston. "The natural environment of Linn County was conducive to sheep raising, and by 1865 it was the leading producer of wool in the Willamette, reporting 132,148 pounds produced."³⁵

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"Thrashing"

Thrashing is the process of removing the grain from the heads of the plant. Essentially, there was a choice between two traditional thrashing techniques with roots predating the writing of the Old Testament. Sheaves, bundles of cut stalks of grain bound with straw or twine, could be beaten with a flail, a two-piece, jointed wooden tool swung with the hands such that one section crashed down on grain bundles laid on a wooden floor or hard packed ground, or the sheaves could be trampled by horse or oxen. "Called "treading," "tramping," or "tromping," the hooves of horses and oxen made to walk or trot on the sheaves replaced the striking action of the flails."¹ The decision to flail or tread may have depended on the specific crop and the intended use of the grain. For instance, oats, barley and buckwheat were generally threshed under the feet of horses, but wheat, rye and peas were flailed.²

Most farmers flailed wheat and rye and brought out their animals for thrashing oats and barley....Some farmers also flailed those portions of the grain crop or grasses set aside for use as seed for the next year's planting...as the direct impact of a hoof could easily bruise, crack, or split the kernels. Damaged seeds were unlikely to germinate if planted the following season.³

Fred Harrison, grandson of early Brownsville area settler, Robert Harrison, described this process saying that his grandfather "...cut his first wheat with a cradle. A good man could cut one acre a day. The grain was cut and spread on the barn floor and the kernels tramped out by oxen which were driven round and round on it. The grain was then winned (fanned) to separate the kernels from the chaff and the straw."⁴

John McCoy recalled that for the wheat crop of 1847, "Lumber was hauled 90 miles, a floor made and the grain tramped out with the oxen. Many of the early settlers used the bare ground for tramping floors. He and a neighbor then constructed a wind mill for separating the grain from the chaff. The only piece of mettle [sic] in the this machine was the endgate rod of a wagon box. The screens were made of raw deerskin whangs,

¹ Rikoon, J. Sanford, *Thrashing in the Midwest, 1820-1940*, (Bloomington, Indiana: Indiana University Press), 1988, p. 1.

² Arthur, Eric and Dudley Witney, *The Barn: A Vanishing Landmark in North America*, (Greenwich, Connecticut: New York Graphic Society Limited), 1972, p. 209.

³ Rikoon, pp. 3-4.

⁴ Haskin, Leslie L., "Interview with Fred Harrison," Work Projects Administration, Oral History Project.

dried."⁵

Prior to the construction of a barn for this purpose, threshing was sometimes accomplished outside on the ground. Sarah B. Findley Radford recalled that her father, John Findley, harvested grain by:

...cutting it by hand with a sickle, bundling it with a wooden rake and tying the bundles with grain ropes, just wisps of the grain taken up and twisted...then hauled to the threshing floor, which was a cleared space around a big oak tree. The sheaves were placed around the circle, and the horses were ridden over them until the grain was tramped out; then pitchforks were used to remove the straw, the grain taken up and put through a fanning mill to separate the chaff, and then taken to a grist-mill.⁶

John Wigle recalled that:

There was not a threshing machine in Oregon then, so we done our threshing by placing from ten to fifteen dozen sheaves in a circle on a selected piece of ground, with the heads up, then I would get on one horse and lead the other and I would have a fine ride round the rim while one or two men with wooden forks would keep the grain in place for the horses to tread on, or we would fence a circle and turn the horses or oxen loose upon it. Then would come the separating of the wheat from the chaff by means of a fan....In the year 1858 when we built a barn we made a threshing floor in it. This was an improvement. Less dust and then we could mow away our grain and thrash it in winter and have the straw to feed our cattle.⁷

⁵ McCoy, J. Fred. "A Biography of John McCoy with a Brief History of Linn County, Oregon." (Albany, Oregon: Richard R. Milligan), March 1983, pp.12-13.

⁶ Linn County Historical Society Newsletter, October 1997, p. 11. (Excerpt from Sarah Findley Radford's A Sketch of Pioneer Days written in the 1920s.)

⁷ Haskin, Leslie L., "Interview with John L. Wigle," W.P.A. Oral History Project, n.d.

The Hamilton Family and Linn County's First Threshing Machine

My grandfather [Joseph Hamilton]...arrived in Oregon in the fall of 1847. Another pioneer who settled here the same year as my grandfather was his brother, William Hamilton. My grandfather, Joseph Hamilton, and his brother William Hamilton, had been engaged in the threshing business before coming to Oregon. They had threshed in both Ohio and Iowa. When they came to Oregon, they brought their threshing machine with them. I mean they brought the essential parts. The machine was dismantled and only the metal parts were brought here. When they were ready to use it again they remade all of the wood parts from Oregon timber....They used it for harvest all around this region. Not all grain was threshed by machine, however. Even my grandfather, besides his mechanical thresher, did much threshing by hand. The old barn on this place, which still stands, was originally built with a big threshing floor in one end, where the sheaf grain was thrown to be tramped out by oxen or horses. I have heard my grandfather tell that often they would be threshing much of the winter, a little each day."¹

Of interest is the Hamilton Family's Ohio background. Rikoon notes that threshing machine use remained limited and sporadic until the early 1840s. The first farmers to abandon flailing and treading were Ohio landowners living near the region's major population centers. Hamilton County, in southwest Ohio, boasted ten machines by 1828 and at least six farmers adopted mechanical devices in northeast Ohio by 1831."²

Linn County's first header reportedly dates to 1851 and was brought to the area by John McCoy.³ "The first Haynes Harvester or - Header as it was often called - brought into the state was by Him [McCoy] and was operated on His farm. Joseph and William Haynes, nephews of the Illinois inventor, worked for Him while building his barn, and assisted in setting up the machine and operating it the first harvest season. A threshing machine soon followed and the two were run in conjunction."⁴ By the 1860s the header began to replace the cradle for cutting wheat in the field. The header was a machine which reaped the head of the grain and passed it to a wagon or other receptacle. Likewise, threshing machines began replacing hand flailing and threshing.

¹ Haskin, Leslie, L., "Interview with Mrs. J. A. Hamilton," W.P.A. Oral History Project,

² Rikoon, J. Sanford, Threshing in the Midwest, 1820-1940, (Bloomington, Indiana: Indiana University Press), 1988, p. 20.

³ Mullen, Floyd C., The Land of Linn, (Lebanon, Oregon: Dalton's Printing), 1971, p. 23.

⁴ McCoy, J. Fred, "A Biography of John McCoy with a Brief History of Linn County, Oregon," (Albany, Oregon: Richard R. Milligan), March 1983, p.13.

The Diary of Jasper N. Cranfills

Jasper N. Cranfills was a young man who lived with his parents near Peoria, Oregon in the 1860s. His diary for 1865 and 1866, provides some information on early agriculture in Linn County.¹ Jasper Cranfills died in early 1867.

- August 3, 1865 -- "Cleaned off barn floor & threshed wheat the rest of the day finished two floors."
- August 4, 1865 -- "Threshed oats and dad went to grist mill with 12 bu. wheat."
- August 5, 1865 -- "Fornoon done nothing but run wheat through fan mill."
- July 21, 1866 -- "cut Wheat & Bound the same one hour 7 one-half probably."
- July 26, 1866 -- "Bound Wheat all day for Father...Raised the best wheat this harvest ever raised before."
- July 28, 1866 -- "Finished binding and shocking by three hours by night, 118 Doz. in All. Hot! Hot!"
- July 31, 1866 -- "Cut oats ¼ of an hour for Father."
- August 1, 1866 -- "Shocked oats for Father 3 hours or more & capped² etc."
- August 3, 1866 -- "Bound Oats 3 hours..."
- August 7, 1866 -- "Hauled oats one half day and worked on bin one hour or more, etc."
- August 8, 1866 -- "hauled oats 9 hours each day."
- August 15, 1866 -- "Unloaded wheat at intervals throughout the day, etc. Father threshed to day etc."
- August 17, 1866 -- "Worked in the Barn cleaning off floor for self."

¹ Cranfills, Joseph, *Diary of Joseph Cranfills, 1865-1866*, Manuscript in the Oregon Collection, Knight Library, University of Oregon, Eugene, Oregon, 1865-1866.

² Cap means to cover the shocks.



—Hay Cap.

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- August 22, 1866 -- "Caved³ up wheat & fanned out and finished near sundown..."
- August 29, 1866 -- "Cut wheat till near twelve o'clock & shocked until completed out one half days work."
- Sept. 1, 1866 -- "...sacked up wheat Hauled one load of oats."
- Sept. 5, 1866 -- "...reshocked some wheat & capped 40 doz. of same etc."
- Sept. 6, 1866 -- "Bound wheat (after cutting one hour and one half suppose) & shocked two hours."
- Sept. 7, 1866 -- "Hauled and threshed upwards of 20 doz. wheat and caved up...fan twice and finished just one half days work."
- Sept. 11, 1866 -- "Worked three hours and one half threshing and cleaning up & fanning out."
- Sept. 12, 1866 -- "Fanned wheat out twice & sacked up and loaded on for Rufus etc. [corrected to September 13]"
- Sept. 14, 1866 -- "Sacked up 6 bu wheat..."
- Sept. 27, 1866 -- "Sowed wheat one half of the day..."
- October 15, 1866 -- "Sckd up 10 bu wheat etc."
- October 16, 1866 -- "Loaded on 10 bu wheat for Peoria etc. Set straw afire dont burn well."

³ Cave means to toss up or pitch; especially to winnow (grain) from chaff by tossing with a rake or by threshing.

Some Antecedents and Contemporaneous Paradigms for Barn Design

According to Philip Dole, the choice of design for a barn could be influenced by a variety of factors. "For the innovative or susceptible spirit a variety of published, traditional barn designs were available".¹ By the mid-nineteenth century, these included G.Shaw's Rural Architecture (1843), Stepens Book of the Farm (1851), and Lewis Allen's Rural Architecture (1852). These books offered barn plans and discussed barn design within the larger context of farm planning.² Barn plans could also be found in periodicals such as Rural Affairs and American Agriculturalist.

Apparently, "...Most pioneers found the barns of their native state "superior". But whether the barn owner or barn builder influenced the design most significantly is an unanswerable question."³ Because of the variety of backgrounds of Oregon's early settlers, barn construction and design reflected traditions from a variety of regions.

In effect, Oregon's first settlers were familiar with the regional styles of almost an entire continent. In practice, although removed thousands of miles from the associations of birthplace, it appears that they often referred to "back home", preferring to use designs and structures with which they were completely familiar, which had, perhaps some sentimental value too. That kind of native or birthplace reference when building has usually been the practice of colonists and pioneers. It is one clear characteristic distinguishing earlier from somewhat later buildings.⁴

The descriptions below outline barn building traditions which could have influenced barn design in Linn County. Linn County barns, while reflecting the traditions of other times and places, also reflect the specific conditions of Oregon's Willamette Valley, and often the experiences of several migrating generations. In speaking of Willamette Valley barns, Philip Dole notes that "The majority of farm buildings constructed here before 1860-1870 seem to suggest adaptations from rural buildings characteristic of such southern and mid-Atlantic coast states such as North Carolina, Kentucky, Virginia, Maryland and Pennsylvania."⁵ This is not surprising given the

¹ Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in Space, Style, and Structure: Building in Northwest America, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, p. 94.

² Harper, Glenn A. and Steve Gordon, "The Modern Midwestern Barn, 1900-Present." Barns of the Midwest, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 230.

³ Dole, p. 94.

⁴ Dole, Philip, "Farmhouse and Barn in Early Lane County," Lane County Historian, (Eugene, Oregon: Lane County Pioneer-Historical Printing Society), Vol. 10, no. 2, Aug., 1965, p. 24.

⁵ *Ibid.*

background of many Willamette Valley settlers. In Linn County's Calapooia River Valley, Peter Guy Boag determined that:

...the adult population ...during the initial stages of settlement had been born in the upper south states of Kentucky and Tennessee, some others in Virginia and Pennsylvania, and a mere handful in New England and New York. These people grew up in Kentucky, Tennessee, Ohio, Indiana, and Illinois. They married in Indiana, Illinois, and Missouri, and had their first children in the latter two states, and then moved on to Oregon and the Calapooia.⁶

While the English Barn is described below, many side-opening barns in the Willamette Valley reflect a southern adaptation of the design prior to its export to Oregon. Philip Dole observes that:

Most side-opening barns in Oregon were derived from a southern antecedent...The general lean-to form familiar in Oregon occurred early in the South from Virginia to North Carolina. It followed the first migrations into Kentucky, Tennessee and also into Ohio and Indiana and on west. It is clear that the earlier barns in Oregon were conventions and not innovations. The same form appeared immediately and at great distances apart throughout the Willamette Valley.⁷

The English (Side-opening) Barn

"A side-opening barn was the major type throughout the Willamette Valley in the 1850s. It appeared in the 1840s, was still being built in the 1860s..."⁸ The Willamette Valley side-opening barn is the progeny of an English barn building tradition which is centuries old. "In England by the 16th century farmers of the yeoman class were building side-opening barns, a scheme taken to America with the colonists."⁹

In New England, as in England, the side-opening barn was used for grain threshing and grain storage. Calkins and Perkins (1995) provide the following description of the functional organization of a three-bay threshing barn, which they note is often referred to as an English barn:

Large double doors are centered on both long sides of the structure. Hand threshing with

⁶ Boag

⁷ Dole 1974, p. 93.

⁸ Dole, 1974, pp. 88-89.

⁹ *Ibid*, p. 93.

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a grain flail was done in the central bay, sometimes called the threshing floor or threshing bay. Following threshing, the large doors were opened to create a draft which, during winnowing, would separate the chaff from the heavier grain and carry it away. Flanking the central threshing floor are two other bays of generally equal dimensions. One was used during the fall and winter to store sheaves of harvested grain awaiting threshing as needed. The other bay was used for storing the threshed grain, commonly in bins, and straw, which was used as feed and bedding for horses and cattle¹⁰

In Europe, the threshing barn was a single-function structure.

Its specific association with grain farming was well established. One mow might hold sheaves of grain stacked for threshing while another mow might hold hay (empty straw). In western Europe, where this type of barn originated, separate structures on the farmstead often housed the other agricultural operations. No self-respecting farmer would keep animals in his threshing barn.¹¹

The harsh New England winters compelled farmers to house livestock.¹² "When the threshing barn was modified to provide space for livestock, additional openings appeared. Most common were individual doors cut into one or both longitudinal sides to permit access to one of the flanking bays."¹³ The barn could also be expanded for livestock and other purposes because the single-level barn adapted easily to modifications. An additional bay could be added to either gable end. "A single-level, three-bay barn could easily be lengthened to become a four- or five-bay structure, providing greater floor area as well as extending valuable overhead space"¹⁴ Lean-tos were not unknown on English threshing barns. A "...variation involved constructing a full-length lean-to on the rear side of the barn. The lean-to size was generally determined by the amount of area that could be covered by the extension of the main roof, because most builders maintained the original pitch of the roof".¹⁵

The Dutch (End-opening) Barn

The following characteristics of a genuine Dutch Barn are derived from Noble and Cleek (1995)

¹⁰ Calkins, Charles and Martin Perkins, "The Three-Bay Threshing Barn," *Barns of the Midwest*, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 41.

¹¹ *Ibid.*

¹² Endersby, Elric, Alexander Greenwood and David Larkin, *Barn: The Art of a Working Building*. (Boston: Houghton Mifflin Company), 1992, p. 61.

¹³ Calkins and Perkins, p. 51.

¹⁴ *Ibid.*, p. 56.

¹⁵ Calkins and Perkins, p.57.

and Fitchen (1968).¹⁶ The Dutch Barn is a barn squarish in plan but greater in width than length. It has large wagon doors at the center of each gable, one or both of which are often Dutch doors, and single, small doors near one or both gable-end corners. The barn has low side walls and a symmetrical gable roof with a roof pitch of about ten in twelve. Eaves were built with a minimum of projection beyond the wall. Sometimes a diamond-shaped window is placed high in the gable. The interior organization is three aisled with the central threshing floor about twice as wide as each side aisle. The usual number of bays is three to four. Of timber frame construction with mortise and tenon joinery, one of the most characteristic features of the Dutch barn is the joinery in which the tenons protrude through the posts. "Often a narrow pentice occurs over the wagon doors. Horizontal siding is usual, and sometimes a diamond-shaped window is placed high in the gable."¹⁷

Geographically, the authentic Dutch barn is principally found in eastern New York State where it is associated with early Dutch settlement.¹⁸ While the geographic distribution of the Dutch Barn is very limited in time and space, the concept of an end-opening barn was dispersed from this core area. Philip Dole, in discussing the 1877 George Armitage Barn in Lane County, Oregon, notes that the concept for the Armitage Barn "may have been developed from the traditional New York State Dutch Barn by any of several vigorous architectural theorists who lived, farmed, and published in New York at the time....George Armitage may also have been predisposed to the design for he came from a Dutch locality -- Queens County, New York".¹⁹ The Armitage Barn is described as "...Squarish in plan, 61' x 70'; a steep roof pitch, about 45°; main doors on a gable end with the central drive flanked by stables; the exterior gable end covered with horizontal boarding."²⁰ "Other barns similar to the Armitage barn can be seen in the Willamette Valley."²¹

The New England (End-opening) Barn

A end-opening barn was also being built in New England before the settlement of Oregon's Willamette Valley. Hubka (1984) refers to this end-opening barn as a New England barn, to distinguish it from the side-opening English barn. He notes that farmers throughout New

¹⁶ Noble, Allen G. and Richard K. Cleek, The Old Barn Book: A Field Guide to North American Barns and Other Farm Structures, (New Brunswick, New Jersey: Rutgers University Press), 1995 and Fitchen, John, The New World Dutch Barn, (Syracuse, N.Y.:Syracuse University Press), 1968.

¹⁷ Noble and Cleek, p. 108.

¹⁸ Fitchen, p. 20.

¹⁹ Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in Space, Style, and Structure: Building in Northwest America, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, pp. 211-212.

²⁰ *Ibid.*, p. 212.

²¹ *Ibid.*

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England began building this type of barn in the early 1800s and by 1860 it had become the most popular form.²²

The nineteenth-century New England barn is easily differentiated from the earlier English barn by the major door centered in the gable end. It was frequently built in a three-bays-wide, three-bays-deep grid and organized around a central vehicle floor that runs the length of the barn parallel to the roof line and the side wall. Since mechanical threshers generally replaced hand threshing between 1830 and 1860, it is inappropriate to label this central bay a threshing floor. Although many observers assume that the central drive floor and its barn door are located in the exact center of the barn, this is infrequently the case. Most New England barns were designed to accommodate a wide haymow bay and a narrow cow tie-up bay, and consequently, the barn door is usually offset from the exterior view.²³

Hubka further notes that:

The change from the old English to New England barn is properly associated with a series of major social and economic changes that transformed many aspects of New England's rural culture in the late eighteenth and early nineteenth centuries. Generally, the barn was an outgrowth of a more commercial agricultural operation. The selection of this new barn was initially implemented by large-scale, progressive farmers in the early 1800s and gradually adopted by most farmers between 1830 and 1880.²⁴

The New England Connected Barn

The New England connected barn appears to be missing from the Willamette Valley landscape. In the typical connected barn arrangement, house and barn are joined together through a series of support structures to form a continuous building complex.²⁵ In New England, connected barns were most popular in Maine and New Hampshire.²⁶ The tradition of connected farm buildings became popular in the early 1800s reaching peak popularity after the Civil War.²⁷

²² Hubka, Thomas C., *Big House, Little House, Back House, Barn: The Connected Farm Buildings of New England*, (Hanover: University Press of New England), 1984, p.52.

²³ Hubka, p.55.

²⁴ Hubbka, p.52.

²⁵ Hubka, p.5.

²⁶ *Ibid*, p.10.

²⁷ *Ibid*, p. 14.

The confinement of connected farm buildings to New England is surprising to historians of America's frontier settlement, who would expect New England farmers to have brought this arrangement to the western states during their long period of migration... This phenomenon is also puzzling to folklorists, historians, and geographers, who have observed that some of the most commonly retained traditions during any cultural migration are the deeply ingrained practices of building construction and usage.²⁸

For Linn County, Oregon, one explanation may rest with the birthplaces of its earliest settlers. The Illustrated Historical Atlas Map of Marion and Linn Counties (1878) includes the place of birth for male residents of the county at that time. Of the approximately 422 males listed, only three hailed from New Hampshire and only two hailed from Maine.

The Double-deck Barn

As distinguished from a two-level bank barn, a double-deck barn is a three level barn, with the term "deck" referring to a raised wood floor. "This kind of barn had two floors of wood for the lowest floor was earth. A double-deck barn is built against a slope or hillside and owes its efficiency to the advantage it gains from having entrances, at grade, on two or even three levels of the building."²⁹

Interest in double decked barns in Oregon developed after 1860 and the use of such buildings in the 1860s shows that farming had made great advances in little more than a decade.³⁰ No double-deck barns have been identified thus far in Linn County and the following description of an Oregon double-deck barn is of the James Edwards' Barn in neighboring Benton County.

The lowest level had spaces for different types of stock. The middle level contained the "grass" spaces...arranged either side of a huge volume for grain and seeds and divided into a dozen bins...The upper level was just the width and length of the drive. The building was entered here by a bridge and, like a bridge, the drive extended across the top of the grain bins, eight feet above the level of the mows. Hay was thrown from the wagon down to the mow; grain, through trapdoors in the floor of the drive. Chutes beneath the bins provided for retrieval. Technical improvement achieved by the levels made use of gravity to relieve work in storage of farm produce and in the feeding of animals.³¹

²⁸ *Ibid*, p. 20.

²⁹ Dole 1974, pp. 120-121.

³⁰ *Ibid*.

³¹ Dole 1974, p.121.

IDENTIFICATION BARNs OF THE PIONEER ERA

PROPERTY TYPE DESCRIPTION

Function and Design

Many of the barns constructed in Linn County during this early period had a multiple purpose function. Functional needs included: a threshing floor; areas for storing unthreshed sheaves of grain, hay, and straw; grain bins for threshed grain; and often an area to shelter a limited number of livestock. Early barn construction reflected the incipient level of agricultural development of the region. Early settlers still harvested wheat by cutting the standing grain with a cradle and bundling it into sheaves. Although mechanical threshers were in limited use in areas of the United States at the time that the Willamette Valley was being settled, threshing machines were generally not an item in the pioneers' inventory of goods brought west by covered wagon.

Horses eventually replaced oxen as the primary "beasts of burden", but both needed to be sheltered. The milk cow(s) and calves were probably also housed in the barn. Separate stock barns were probably erected on farms where livestock, such as horses, were the focus of the operation. Otherwise, apparently in the early years of settlement, cattle and sheep required little in the way of shelter. Silas V. Barr, in speaking of the Fernridge area of Linn County recalled that:

"This region has always been stock range. The hill land is good, but mostly better for pasture than for crops. We have raised sheep and cattle here all these years....Sheep are profitable here, too. They live out and need little care. In the early days, a big, wide branched fir tree, with a rail fence about it, was about the only sheep-barn that we needed."¹

In addition to sheltering grain and stabling a small quantity of livestock, early Linn County barns were used for political meetings and church services. The first election in Linn County was held in the James Knox barn.² In at least one instance, a barn was used for storing camas for Native Americans. Mrs. J.B. Burkhart, daughter of Milton Hale, recalls the "...great cakes of baked, dried camas, which the Indians used to bring to my father's barn to store for the winter."³

¹ Haskin, Leslie L., "Interview with Silas V. Barr," W.P.A. Oral History Project, Linn County, Oregon, January 22, 1940.

² Haskin, Leslie L., "Clora Hyde Interview," W.P.A. Oral History Project, Linn County, Oregon, n.d.

³ Haskin, Leslie L. "Mrs. J.B. Burkhart Interview," W.P.A. Oral History Project, Linn County, Oregon, n.d.

A Willamette Valley Side-opening Barn

As defined by Philip Dole, the Willamette Valley side-opening barn is a single-level, timber frame, post and girt building. The central enclosed volume, exclusive of lean-tos, is generally "...30 x 60 feet in plan and from floor to plate 15 to 18 feet."⁴ Large double doors are centered on both long sides of the structure. The building is divided into bays, which are defined as the spaces between the bents. The functional organization of the building was often delineated by the bays. In Linn County, barns of this type often had four, five and even six bays instead of the three bays typical of what is known as the English threshing barn.⁵ Of the 18 extant side-opening barns estimated to pre-date 1870, one has six bays; four have five bays; ten have four bays; and three have three bays. Three-bay barns recorded are between 34-36 feet in length; four-bay and five-bay barns are from 40-60 feet in length; and the six-bay barn is 75' in length. Widths range from 24' to 30' excluding integral lean-tos which each generally add approximately 12' per lean-to.

"The roof pitch is very low and since a number of lean-tos surround the center, the building has a rather flat and spreading look..."⁶ In the 1860s, this roof pitch became steeper. "Increase in roof pitch may have been in response to Oregon's rainfall, or to produce a stiffer structure, or perhaps because architectural style after 1860 favored steep roofs. Other than that, lean-to forms and unpainted vertical siding characterized the majority of new barns..."⁷

A characteristic of many farmstead barns during the period prior to 1870 was the presence of a threshing floor. The antecedents of the threshing barn are ancient with roots in "...both continental Europe and the British Isles. In America, it became the barn of choice among the majority of early settlers. It fit well into the small-scale, mixed agriculture of New Englanders..."⁸ As in New England, this barn is associated with the early agricultural development of the Willamette Valley when grain production was at or near subsistence level. "The organization of the barn was based on long established functional principles established before the development of agricultural machinery, which the Oregon farmer did not have at the time these barns were being built."⁹

⁴ Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in *Space, Style, and Structure: Building in Northwest America*, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, p 89.

⁵ Calkins, Charles and Martin Perkins, "The Three-Bay Threshing Barn," *Barns of the Midwest*, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, pp. 40-61.

⁶ Dole, p. 89.

⁷ Dole, p. 120.

⁸ Noble, Allen G. and Hubert G.H. Wilhelm, *Barns of the Midwest*, (Athens, Ohio: Ohio University Press), 1995, p. 12.

⁹ Dole, p. 90.

The wagon drive was generally located in an interior bay, often the center bay in barns with three bays. The wagon drive also served as the threshing floor which generally encompassed an adjacent bay. In order to provide a space that was unencumbered by a center post, builders often removed the center post from the bent located between the two bays which, combined, served as the threshing floor. Dole notes that:

Each builder became particularly inventive in creating the open space desired for the threshing floor. Each solution proves to be unique. The problem was to combine the 15 x 30-foot wagonway or drive with an adjacent space to create an uninterrupted threshing floor about 30 feet square for turning horses. The barn's structure was made up of a plan module about 15 feet square marked by a hewn post at four corners. To omit the center post of the 30 x 30 threshing floor required an exceptional, long span truss, which also had to support the weight of stacked wheat in the loft.¹⁰

Dole (1974) refers to this member as a sway brace, while Noble and Cleek (1995) refer to this member as a swing beam noting that "Some Three-Bay Threshing barns are constructed with a swing beam, a beam larger than the others which extends unsupported from front to back of the barn on one side of the threshing floor. It permits threshing of grain and turning of teams, unhindered by a post."¹¹ Apparently, the swing beam is a Yankee innovation and is not found in barns in England.¹² Examples of some swing beam configurations used for Linn County Barns are illustrated in Figure 2a-c.

The doors at either end of the wagon drive/threshing floor allowed a team to enter and pass straight through the barn.¹³ Unthreshed wheat was stacked in the loft over the threshing floor.¹⁴ An overmow for additional storage was sometimes located above the wagon drive (Figure 3). The overmow was often made of scaffolding which could be increased or removed according to need. The two opposite wagon doors provided a through draft for winnowing prior to the acquisition of fanning mills.

In the side-opening barn, a haymow was generally located on one side of the threshing floor. The mow often was often one or two bays in size and extended from floor to roof. Several

¹⁰ Dole, p. 91.

¹¹ Noble, Allen G. and Richard K. Cleek, The Old Barn Book: A Field Guide to North American Barns and Other Farm Structures, (New Brunswick, New Jersey: Rutgers University Press), 1995, p. 78.

¹² Endersby, Elric, Alexander Greenwood and David Larkin, Barn: The Art of a Working Building, (Boston: Houghton Mifflin Company), 1992, p. 64.

¹³ Dole, p.89.

¹⁴ Ibid.

authors describe the low retaining wall that was often located on the side of the threshing floor dividing the threshing floor from the haymow (Figure 3). Calkins and Perkins note that "Smaller horizontal girts often extended from both sides of the central upright to the bent's endposts. Positioned into the upright, approximately four feet from the floor, the girts often served as a frame for a short retaining wall, formally separating the center threshing aisle from the adjacent bay."¹⁵ Gray states that "The hay was stored in a mow to one side of this floor, and a tightly boarded breast girt kept the loose grain from scattering into the hay."¹⁶ Sloane explains that "A waist-high mowstead or threshing wall divided the mows from the threshing area."¹⁷ Rikoon refers to the low permanent walls, sometimes called "mowsteads."¹⁸ Often a ladder was framed into the bent adjacent to the haymow (Figure 4). Some farmers used a rack lifter, a horse-driven mechanism situated in the beams over the wagon drive, which lifted the loaded hay rack from the hay wagon to the necessary height where the hay was forked by hand into the mow.

The other bay flanking the threshing floor was used for storing the threshed grain in bins. A limited number of livestock could also be stabled in this bay.

"...along the far end are two or three small grain bins with a total capacity of about 1,200 bushels and perhaps a small bull or calf pen....The small size of the grain bins suggests a small acreage developed suitable for wheat, or farms more generalized rather than specialized in crops, and also threshing smaller quantities at a time rather than threshing the whole crop."¹⁹

Straw or unthreshed sheaves of grain could be stored above the livestock and the grain bins as well as over the non-drive portion of the threshing floor. Mows upon scaffolds were recommended to prevent moisture damage.²⁰ From there, sheaves could be thrown directly down onto the threshing floor. Cows could run loose in the barnyard and could seek shelter in an open shed or lean-to connected to the barn.²¹ "It was common practice to stack the roughage in the center of the barnyard and allow the stock to feed directly from the stack.

¹⁵ Calkins and Perkins, p.49.

¹⁶ Gray, Harold E., Farm Service Buildings, (New York: McGraw-Hill Book Company), 1955, p. 4.

¹⁷ Slone, Eric, An Age of Barns. (New York: Funk and Wagnalls), p.48.

¹⁸ Rikoon, J. Sanford, Threshing in the Midwest, 1820-1940, (Bloomington, Indiana: Indiana University Press), 1988, p. 10.

¹⁹ Dole, 89-90.

²⁰ Deane, Samuel, The New England Farmer, (Boston, Wells and Lilly), 1822.

²¹ Gray, p. 4.

An open shed attached to the barn furnished shelter for the animals during severe storms."²² In Oregon, many early barns incorporated lean-tos in their designs providing shelter for stock. These lean-tos, which were often earth floored, "...occur on only one side, usually on two or three sides, and sometimes on four sides of the central volume."²³ Sometimes lean-tos are integral, that is within the main volume of the barn. Sometimes the lower walls of the lean-tos were left open to provide accessible shelter for livestock. The Powell Barn (Figure 4) illustrates this type of shelter with a mow located above.

While lean-tos were one way to expand the side-opening barn, bays could also be added to either end. A barn-length shed could also be added across the rear side creating "...a saltbox-roof appearance."²⁴ The Matthew Chambers Barn (ca.1860), a National Register property in Linn County, has been expanded with the addition of two bays on one side for additional grain bins, and with a rear lean to for livestock (Figure 5).

Of the twenty-three barns estimated to have been built prior to 1870 recorded during the 1996 survey (Table 1), side-opening barns predominate with 18 examples. Figures 5-9 illustrate a number of these side-opening barns and their corresponding plans.

The Willamette Valley End-opening Barn

An end-opening barn was also built during the early settlement period in the Willamette Valley. In contrast to the side-opening barn, the end-opening barn has the main wagon entrance on the gable end. Quite often this was a stock feeding barn, located in a pasture some distance from the house.²⁵ Characteristics of early examples include hewn construction with:

lean-tos of hewn frame construction, partly enclosed with vertical boards, earth floored and with feeding racks for loose stock. The lean-tos surround three sides of a taller hewn framed enclosed structure, which would have a wood floor and large doors on one side. As the lean-tos are an integral and original part of the construction, the very low pitched roof has an extensive spread and seems to "nearly touch" the ground"²⁶

In Linn County, four end-opening barns estimated to pre-date 1870 were recorded during

²² Ibid.

²³ Dole, p. 89.

²⁴ Noble and Cleek, p. 78.

²⁵ Dole, p. 88.

²⁶ Dole, pp. 87-88.

BARN DESIGN AND CONSTRUCTION, 1845-1870

TABLE 1. List of extant barns known or estimated to have been built prior to 1870. (Based on 1996 survey of barns in Linn County)

<u>HISTORIC NAME</u>	<u>ADDRESS</u>	<u>TN/RG/SEC</u>
The Matthew Chambers Barn	Scravel Hill Rd.	10S/3W/35
The Hugh Leeper Brown Barn	Hwy. 228	14S/2W/05
Silas Haight Barn?	Conser Dr.	10S/3W/29
Blount-Hayes Barn	34311 Red Bridge	11S/3W/25
Joseph Hamilton Barn	30021 Tangent Dr.	12S/4W/16
Hogue-Sprenger Barn	30504 Hwy. 99E	13S/4W/01
Levi Fanning Barn	33060 Tangent Loop	12S/3W/09
Wm. Cochran Barn	28485 Brownsville Rd	13S/2W/19
Eli Officer Barn	38603 Kelly	10S/2W/16
Osborn Barn	38528 Ridge Dr.	10S/2W/01
Geisendorfer Barn	Scravel Hill Rd.	11S/3W/03
D.F. Crabtree Barn	38201 Balm Dr.	11S/2W/12
John Settle Barn*	33916 Santiam Hwy.	11S/2W/34
Gideon Backus Barn	Spicer Dr.	11S/2W/29
Pennington Barn	36570 Spicer Dr.	11S/2W/28
David Putman Barn?	32283 Diamond Hill	15S/3W/08
Pierce Barn	23888 Roland	15S/3W/05
Davis Barn	Coburg Rd.	15S/4W/15
Powell Barn	36375 Gore Dr.	12S/2W/04
Kinzer Barn	Crabtree Dr.	11S/2W/11
Backensto Barn?	36596 Richardson Gap	11S/1W/04
J. Pearl Barn	25425 Center School Rd.	14S/3W/23
Henry Jackson Barn	33043 Seven Mile Lane	12S/3W/10

*This barn burned in the fall of 1996.

the 1996 survey. All were located on farmsteads and no examples of early field barns were located. The Linn County examples are generally four bays deep. Two of the barns incorporate swing beam bents providing a wide center aisle suggesting that the barns may have been designed for threshing. Unfortunately, both barns have been altered to such an extent that it is difficult to reconstruct the original spatial organization. The other two examples have 12' drives and no indication of a threshing floor, perhaps indicating a date of construction at a time when the threshing machine was in common use. All of the barns have a hewn timber frame. Figures 10-12 illustrate three of these side-opening barns and their corresponding plans.

A Bank Barn

Only one bank barn believed to predate 1870 was recorded during the 1996 survey. A bank barn is a two-level barn whose upper level is entered from a bank or hillside or by a ramp constructed against the barn. The lower level, or basement, is often used for livestock. The Cochran Barn (Figure 13) is unusual because it has bank access from a side-end and a gable-end (corresponding to the east and the south elevations). This has resulted in a combined transverse and longitudinal configuration of the drive on the main level providing for through entry and egress, which would not have been possible with a single directional drive. The main level of the barn was originally used for threshing grain and storing hay, grain and straw while the lower level housed livestock. The barn has three large mows, probably reflecting Mr. Cochran's emphasis on stock raising. The convenient arrangement of the mows and bins along the drive reflects the forethought which must have gone into designing this barn.

Materials and Workmanship

Andrew Kirk, son of Riley Kirk, noted that his father's first home on the Calapooia was "made merely by building a rail pen beneath a wide-spreading white fir tree...Such a shelter was common in those days. Besides using fir trees for houses, it was still more common to use them for barns."²⁷ With the first acreage cleared and planted came the need for a structure to store crops. Log barns and/or granaries were sometimes built as a temporary solution until a timber frame barn could be erected. Leander Kirk noted that his father "had an old log granary near his house. Beyond the granary he had a field of oats."²⁸

The timber frame barn was built several years after a claim was taken as a more permanent solution to the needs of threshing, storing grain and hay, and sheltering animals. Philip Dole observes that:

²⁷ Haskin, Leslie L., "Interview with Andrew Kirk," W.P.A. Oral History Project, Linn County, Oregon, n.d.

²⁸ Haskin, Leslie L., "Interview with Leander Kirk," W.P.A. Oral History Project, Linn County, Oregon, 1939.

BARN DESIGN AND CONSTRUCTION, 1845-1870

With the building of the hewn frame, permanent barn came several related major changes: a new aspect of building practice appeared; organization of the farm building site entered a critical phase; and farming entered a more stable and advanced level of operations. The importance of the permanent barn to the farm is shown by its early date which, however, is seldom more definitely known than "a year or two before the house," and more generally stated as "barns were always built before the house." The earliest we can expect a hewn frame barn to appear would be two or three years after the claim was taken.²⁹

Several descriptions of early barn construction in Linn County have been recorded. John McCoy's construction of a frame barn on his claim is described by J. Fred McCoy:

Soon after building His first cabin, he built a second one, similar in size and construction leaving off the chimney, some nine or ten feet away and on line with the first, and soon after, when lumber became available, the space between the two was enclosed, so that the three together made quite a roomy and comfortable pioneer residence and was occupied for a several years and until after his large barn was built. The frame timbers of this barn were hewn out of native forest trees with a broad-axe, the weather-boarding and roof was of clapboards.³⁰ It had a roomy floor in the center in which the grain was tramped out, both cattle and horses being used for that purpose - for some years, and until threshing machines were brought into the country.³¹

John L. Wigle, whose family settled east of Harrisburg, recalled that:

In 1853 and 1854 we built us a good commodious and comfortable hewn log house as fine a house as there was in the neighborhood and in 1858 we built us a log barn which still stands. For a foundation we went to the near by mountains and brought the heavy...rocks some of them were too heavy to load on the wagon and we dragged them. Frank Pierce has and will always have a good foundation under his barn and a good stone for his stable door to open against, I brought that rock from out of our grain field. Elisha Whitley came to see us when we were getting our barn timbers. He and I done the scoring and father the hewing....This work by Whitley was given on his contract with father for bringing him to Oregon and I do not think there was another

²⁹ Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in *Space, Style, and Structure: Building in Northwest America*, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, p.86. House in this context refers to the frame house which replaced the log house or cabin.

³⁰ Clapboards may refer to shakes. Zachariah Bryant, a local barn builder noted that "Where I came from in Indiana the shakes was called clapboards." From: Bryant, Zachariah T., "An Unpublished Autobiography of a Carpenter/Builder and Civil War Soldier," Written and Transcribed in 1935, p. 40.

³¹ McCoy, J. Fred, "A Biography of John McCoy with a Brief History of Linn County, Oregon," (Albany, Oregon: Richard R. Milligan), March 1983, p. 11.

one of the hands of the company who ever paid anything.³²

Mrs. Lena Snyder Anderson recalled that "When mother [Delia Simons Snyder] was fifteen years old, she has often told me, there was a very big barn put on the Parker place, near here -- largest barn in all the country. The barn timbers were heavy hewed fir beams and all the men of the region came to help at the raising. I can still remember that barn. It was large, but not anything like the present day barns."³³

The barn raising marked the middle stage in the building process, usually done in a day with a volunteer or paid crew of 20 to 30 men selected from the locality for their various skills with one man as boss, probably the builder. The builder's work had gone on for six months or more previously, assisted by one or two other men. First felling the timber, then hewing and hauling the members of the frame. There were also siding, flooring, roof sheathing and shingles or shakes to make or obtain as well as the hardware. Following the raising, finishing off the building took another six months. No paint or stain was used. Forty years was claimed for the life of a good "shaved shingle" roof.³⁴

Few names of early barn builders have been found. In the Providence-Lebanon area, Luther Elkins was a barn builder. A letter from James Elkins, a son, to Judge Matthew P. Deady, dated May 11, 1854 noted that his father had been and still was engaged in carpentry having a fine frame for a barn ready for erection but he had ceased in order to build two others for neighbors.³⁵

The Post and Beam Timber Frame Barn

Timber frame, post and beam construction dominated barn building in Oregon in the 19th century prior to the introduction of lighter framing techniques. Timber frame barns are fabricated using large wood members known as timbers which are defined as straight sticks of wood larger than four inches square. A timber frame barn incorporates vertical structural timbers (posts) and horizontal structural timbers (girts or tie beams) to form a skeletal structural framework. The building blocks of this framework are structural units called bents. A bent is a unit composed of at least two end posts joined near their upper ends by a tie beam. The barn frame is created by connecting a series of bents at the bottom to the sill timber, which rests on the foundation, and at the top to the plate timber. The plate timber connects

³² Haskin, Leslie, L., "John L. Wigle Interview," W.P.A. Oral History Project, Linn County, Oregon, n.d.

³³ Haskin, Leslie, L., "Interview with Mrs. Lena Snyder Anderson," W.P.A. Oral History Project, Linn County, Oregon, June 7, 1939.

³⁴ Dole, p. 93.

³⁵ Johnson, Dave, Letter to Patricia Dunn, September 5, 1996. (Mr. Johnson quotes a letter which he located in the Manuscript Collections at the Oregon Historical Society.)

the tops of the end posts and supports the lower ends of rafters. The spaces between the bents are known as a bays.

The earliest timber frame barns incorporated mortise and tenon joints to connect posts and beams. An ancient method of all wood joinery, mortise and tenon is a method of joinery whereby a projecting member, the tenon, is inserted into a cut-out hole, the mortise, and held together by a wooden dowel, often made of oak, called a treenail, pin or peg (Figure 14). Although illustrated in Figure 14, pegs were not commonly used for braces in Linn County Barns.

Timbers 60 feet in length were observed in early Linn County Barns of this period. Although splicing timbers in early barns was not often required, pegged scarf joints of various types were used to splice timbers extending in the same direction and requiring great lengths such as sills, plates, and purlin plates. Photographs of various scarf joints found in Linn County timber frame barns are illustrated in Figures 15 and 16.

Locally, the substructures of timber frame barns consist of perimeter frames of sill timbers connected by a number of transverse timbers, and, depending upon the size and design of the barn, by longitudinal girder(s). Floor joists are generally peeled logs flattened on the upper surface and notched or mortised into the sill and the other base timbers (Figure 17). In several Linn County barns the logs were not peeled. Base timbers rest on footings of either large boulders from a nearby creek or sections of cedar or oak trees, sometimes two or three feet in diameter (Figure 18).³⁶

"Builders adapted the frame to the farmers' needs by adding various upright, girt, and brace timbers. One typical modification was the addition of a third vertical post. This post provided additional support near the center of the massive girt."³⁷ A bent also incorporates a number of braces, diagonal members extending from the posts to the beams that serve to stiffen the frame. Side or wall girts, horizontal members along the wall plane extending from end post to end post, stiffen the frame by connecting the bents and provide nailing surface for the exterior siding.

Examples of bent configurations located in barns predating 1870 in Linn County are illustrated in Figures 19-20. The simplest bents have an "H" configuration (Figure 19). A modification of this design adds an integral lean-to on one or both sides (Figure 19, bottom). Narrow barns, 24' or less in width, often have rafter pairs which are unsupported at mid-span. Wider timber frame barns often incorporate purlin plates, longitudinal timbers which provide the

³⁶ Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in *Space, Style, and Structure: Building in Northwest America*, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, p. 92.

³⁷ Calkins, Charles and Martin Perkins, "The Three-Bay Threshing Barn," *Barns of the Midwest*, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 48.

rafters with additional support between the plate and the ridge. Purlin posts are uprights which extend from the top of the tie beams to the purlin plates. These posts are either upright, in the Queen post mode, or are canted (Figures 20) .

The roof structure generally consists of common rafters which meet at the peak and are joined without an intervening ridgepiece. In Linn County, rafters in early barns were often 3" in width. At the lower end, rafters, which sometimes taper toward the lower end, are inserted into rafter seats and pegged or nailed to the plate (Figure 21). Sheathing material for the roofs of early barns consists of wide, rough-sawn boards with the outer edges retaining their bark and are therefore waney-edged (Figure 22). The use of waney-edged roof boards is not exclusive to the pioneer era barn; the use of dimension lumber for this purpose, however, is probably more common after 1870. Laid longitudinally over the rafters, these boards are arranged in rows, usually several inches apart, and serve as sheathing to which wood shingles or shakes were nailed.

The barn's frame is enclosed with an application of vertical boards, attached to the sill, the side and end girts, and the plate on the side ends. In earlier timber frame barns, the siding is sash or rough sawn and of irregular widths sometimes up to 24 inches.³⁸ Several early barns observed in Linn County had grooved plates and sills to receive the siding thereby limiting nail use. Gable ends, because of the additional height, sometimes required separate boards for wall and gable. "A space of approximately one inch between boards allowed air circulation to promote the drying of grain or hay. Where the barn housed animals, especially horses, open spaces in stable areas were sometimes covered by wood battens to reduce drafts.³⁹ In early Linn County barns, shakes may sometimes have been used for the exterior cladding.⁴⁰

"Almost all of the material for an early barn could come right off the farm....There were few farms that did not have stands of timber, even of first growth fir."⁴¹ After trees were cut, they may have been cured for a year or two prior to hewing.⁴² The earliest timber frame barns incorporated hewn timbers for the larger structural members such as sills, posts, tie beams, plates, and purlin plates (Figure 14, top right). Locally, timbers used in early barns were generally of fir, irregular in size with little standardization from barn to barn except that timber dimensions ranged between 8" to 15" for posts and beams. Special members, such as a swing beam, could have larger dimensions. Smaller members, like the braces, were often

³⁸ Dole, p. 89.

³⁹ Calkins and Perkins, pp. 50-51.

⁴⁰ Haskin, Leslie, L., "Interview with John Wigle," W.P.A. Oral History Project, n.d.

⁴¹ Dole, p. 92.

⁴² Endersby, Elric, Alexander Greenwood and David Larkin, *Barn: The Art of a Working Building*, (Boston: Houghton Mifflin Company), 1992, p. 11.

BARN DESIGN AND CONSTRUCTION, 1845-1870

sawn. "Smaller logs of lesser length and diameter were unsuited for hewing. Some builders chose to leave these lighter-weight pieces in their natural rounded state. However, their portable size also allowed for wagon transport to a nearby sawmill, where they could be processed by water-powered vertical saws into uniformly dimensioned support beams."⁴³ While hewn timbers were incorporated in many pioneer barns, sawn timbers were sometimes used after the establishment of local sawmills in the 1850s. Generally, the sawn timbers had dimensions ranging between 8" and 10". Hubka, referring to barns in New England notes that "...Many barns built after 1840 employed standardized 8 inch by 8 inch straight-sawn major structural members..."⁴⁴

The 1850 United States Census for Linn County, Oregon, Schedule 5, Products of Industry, lists three water-powered sawmills operating at that time. Not enumerated is the Templeton sawmill near Brownsville established in 1850. Other sawmills in operation during the 1850s included the Powell sawmill near Knox Butte in operation by 1854, and the John Crooks sawmill located in the Dever Conner area by 1852. Records from the Powell sawmill verify the sale of sawn timber for barn construction in the late 1850s and 1860s.⁴⁵ Anthony M. Baltimore recalls that:

In the early days all lumber was sawed in this region by the use of the old fashioned 'up and down' saws. The carriage holding the logs was frequently pushed by hand and the sash saws went 'rip, rip'. Those old saws worked very slowly compared to modern saws, and after the lumber had been sawed out, it all had to be dressed and planed by hand. It was from such a mill, situated on 'Mill creek', north of grandfather's claim, that he obtained the lumber for his house. [His grandfather, Philip Baltimore, arrived in 1853.] I cannot tell who owned that mill, but I do know that there was one mill owned by Anderson Cox and another mill owned by John Powell, the Christian Church preacher.⁴⁶

The earliest Linn County sawmill may have been the Anderson Cox sawmill. Mrs. Charlotta (Montieth) Pipe recalled that, "In the fall of 1849 Anderson Cox began the construction of a sawmill on a small stream which is now spanned by a county bridge on the road between Albany and Jefferson. This was the first sawmill built in Linn County."⁴⁷ In the eastern portion of the county, "Lowell Ames built the first sawmill in Sweet Home in 1856. It was an

⁴³ Calkins, Charles and Martin Perkins, "The Three-Bay Threshing Barn," *Barns of the Midwest*, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 47.

⁴⁴ Hubka, p. 56.

⁴⁵ Powell Family Papers, Manuscript Collection, Oregon Collection, Knight Library, University of Oregon, Eugene, Oregon.

⁴⁶ Haskin, Leslie, L., "Anthony M. Baltimore Interview," W.P.A. Oral History Project, Linn County, Oregon, April 17, 1940.

⁴⁷ Haskin, Leslie L., "Interview with Mrs. Charlotta (Montieth) Pipe," W.P.A. Oral History Project, n.d.

up and down mill with a capacity of 1000 board feet per day. This was a water-powered mill that could be operated by one man. It was located at the mouth of Ames Creek. A barn, built from lumber produced by this mill was still standing in the 1950s on the John Galbraith ranch east of town.⁴⁸ Even if sawn timbers were used, often the longer timbers, such as those used for the sills and tie beams, were hewn so it is not unusual to see both sawn and hewn timbers used contemporaneously. Sawn planks in early barns are sometimes stub-shot where the end of the sawn plank has been split from the log (Figure 22).

Locally, glazed windows were generally not used in early barns. Instead, "Hundreds of narrow gaps between boards provide dim interior light, as well as ventilation."⁴⁹ Early barns were usually unpainted.

Flooring consisted of wood planks. The widths of these planks were often irregular predating the availability of standardized lumber. It has been noted that the flooring under the central bay usually received special reinforcement, so that it would not collapse under the heavier weights drawn into the threshing aisle.⁵⁰ There was also a concern for the loss of grain that could occur if there were spaces between the planks. Tightly laid plank surfaces on the threshing floor prevented the passage of any threshed grain between the boards. Most barn builders laid single-layer floors with two-inch-thick planks that could withstand the constant pounding. Other farmers constructed special threshing surfaces of two board layers running perpendicular to one another or with their joints overlapped.⁵¹ Another joinery technique used a tongue-and-groove connection between boards. "Builders often cut grooves into both sides of every board and then inserted a narrow tongue. This produced a threshing floor of well-fitted joints which, when individually spiked into the joists, created a permanently tight floor system."⁵²

Nail use was limited in early barns. When nails were used to attach the siding, they were commonly machine cut (square). Handwrought nails and spikes were also observed in early Linn County barns but often in non-structural situations. Roller doors were in use in the eastern United States as early as 1855.⁵³ Doors observed on extant barns of this period in Linn County, however, were hinged with the wagon doors double-leaf. A standard post was

⁴⁸ Steinbacher, Martha, *In the Beginning...* (Sweet Home, Oregon: Tell and Sell/Sweet Home Printing), 1979, p. 29.

⁴⁹ *Ibid.*

⁵⁰ Calkins and Perkins, p. 48.

⁵¹ Rikoon, p. 10.

⁵² Calkins and Perkins, p. 56.

⁵³ *Improvement in Barns*, *The England Farmer*, (Boston: Joel Nourse, Quincy Hall), Vol. 7, 1855, p. 540.

often located in the center between the leaves (Figure 23). Mortises in the sill and the door girt held the post in place. Metal fasteners such as pintles, strap hinges, and latches were hand forged (Figure 24). Wood dowel harness holders were often drilled into posts and side girts in the horse stable and often can identify areas used for this purpose when other evidence such as stalls have been removed (Figure 24).

In the 1860s, hewn timbers and sawn timbers continued to be used for barn construction but the increasing availability of standardized lumber provided siding and flooring of regular dimensions. This lumber was available in more locations of the county as the number of sawmills increased. Tables 2 and 3 list the sawmills enumerated in the 1860 and 1870 U.S. Censuses of Linn County.

Stalls and Other Means of Stabling Livestock

The following information is taken from a reprint of an 1860 issue of *Rural Affairs*. Since stalls and stanchions have frequently been removed from early barns, an idea of space requirements is valuable when trying to determine function when analyzing spatial organization.

Stalls for horses can be made;

...by setting a stout vertical post from floor to joist overhead, from which a stout scantling proceeds in an inclined position to the head of the stall to hold the partition plank. The underside of this scantling is grooved to receive the ends of the plank...The partition should be about seven feet high at the head, and average about four feet at the rear; they are usually made about seven feet long, but six feet in length is preferred by some....The stalls should be at least five feet wide -- The whole width of the stable no less than twelve feet, and the height at least nine feet...⁵⁴

Cow stalls;

...vary in construction according to the method adopted for fastening cattle....When every animal is separated from the others, each in its stall...the stalls...need not be more than three and a half feet wide....The entire length should be about 14 feet -- at least two feet for the manger, seven feet for the cow (very large will need 8 ft.) one foot for the manure gutter, and about 3 feet for clearing away manure, passing for milking, &c....Another mode of securing cows, frequently adopted...is the sliding halter....An iron ring or chain loop, sliding easily, encloses the stake, and a smooth chain, attached to this, passes around the neck of the animal, and is fastened by a

⁵⁴ Thomas, J.J. *Rural Affairs, Vol. II*. (Albany, New York: Luther Tucker & Son), 1889, p. 285. (Reprint of *Rural Affairs* for 1858-1859-1860.)

broad-tongued hook....A third mode of securing the animal is by stanchions....Each one consists of two upright stakes or strips of plank, placed just far enough apart for the neck to move up and down freely, but not allowing the escape of the head. One of the strips is movable at the top so as to slide open wide enough to admit the head of the animal, when it is returned to its place and secured by a pin--its upper end sliding between two bars of wood.⁵⁵

Table 2. List of Lumber Mills operating in Linn County in 1860 from the 1860 U.S. Census. (All are water powered mills except the mill owned by William Smith which was steam powered.)

William Smith
J. Driggs and Co.
Lewis Cox
John A. Powell
Lewis Cox (second entry)
J.B. Irvine

Table 3. List of Sawmills operating in Linn County in 1870 from the 1870 U.S. Census. (All are water powered mills except the mills owned by Benjamin Cutler, Parker & Co., George Ecker, and Roberts Sawmill, which were steam powered.)

Wiley & Co.

BROWNSVILLE PRECINCT
John Sloan
Har__ Smith
Outman Sawmill
David Allingham
Conaway & Bro.
McDowell & Co.
Benjamin Cutler
Wm. McAlister

ALBANY PRECINCT
Donahou & Cooper
Parker & Co.
Roberts Sawmill

LEBANON PRECINCT
James W. Gibson

PEORIA
George Ecker

⁵⁵ Thomas, pp. 286-287.

EVALUATION

"Most barns have been constantly added to, altered, rebuilt, and remodeled throughout their history. They are the products of many individuals, generations, ideas, and social and economic changes. The sense of evolution communicated through vernacular environments is what makes them meaningful. Their significance is often local, highly personalized, and, in many cases, subconscious."¹

Property Type: BARNS OF THE PIONEER ERA

Property Type Significance: Barns dating to the mid-19th century in Linn County are a very significant property type. Traditions embodied in the conception of early Linn County barns demonstrate a cultural continuity from Europe, to the English colonies in America, and, at the dawn of the age of mechanized agricultural production, to Oregon's Willamette Valley. The diverse barn building traditions of a nation adapting to the frontier conditions at the end of the fabled Oregon Trail are embodied by these barns. Constructed during the only period in Linn County history when agriculture was a subsistence activity, these barns illustrate several major themes in Linn County history with areas of significance including settlement, agriculture, and architecture.

Barns associated with Euroamerican settlement of the region may be significant under **Criterion A** of the National Register.² These barns may also meet Criterion A for their association with the early agricultural development of the region.

Criterion B of the National Register may be met by barns that are associated with the lives of persons significant in Linn County history particularly if the individual's contributions were significant within the context of agriculture.³

Criterion C of the National Register may be met by barns which either exemplify the pattern of features common to barns of this period (See Table 4), or illustrate individuality or variation.⁴ While standard in concept, these early barns can be highly individual in construction

¹ Dandekar, Hemalata C. and Eric Allen MacDonald, "Preserving the Midwestern Barn", Barns of the Midwest, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, pp. 265.

² Criterion A of the National Register states that properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history.

³ Criterion B states that properties may be eligible for the National Register if they are associated with the lives of persons significant in our past.

⁴ Criterion C states that properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

detail.⁵ Barns may also be significant for illustrating transitional or evolutionary characteristics. For instance, the threshing floor may be eliminated in barns constructed during the latter part of this period because mechanical threshers were available at that time, or, the framing may be designed to accommodate the hayfork which was developed in the early 1860s. Barns may be eligible under Criterion C for illustrating the adaptations typical to that property type. For instance, many pioneer barns were modified in the latter part of the 19th century by raising the height of the barn so that it could accommodate a hay fork and have a full second level for hay storage. A barn may also be eligible under Criterion C if it was built by a builder recognized for his consummate skill. "The work of an unidentified craftsman is eligible if it rises above the level of workmanship of the other properties encompassed by the historic context."⁶

Property Type Quantity, Quality and Condition: The 1996 survey identified 27 barns estimated to be date from this period. Four of the 27 were not recorded; three because they had been extensively altered, and one because permission was not granted. In the latter case, the barn had been largely gutted and was in very poor physical condition. Two of the 23 recorded barns, the Hugh Leeper Brown Barn and the Matthew C. Chambers Barn, are listed on the National Register of Historic Places. One of the 23 recorded barns, the Settle Barn (ca. 1850), was destroyed by fire shortly after it was recorded by the survey team. Seven of the recorded barns are in such poor physical condition that collapse may occur during the next severe storm. Several barns have been gutted so that little except perhaps their framing and form remains. Only a very small number of pioneer barns survive in reasonable condition; therefore, some of the subtypes within this group are represented by only one or two examples. Because of their rarity and individuality, the integrity threshold is less for pioneer barns than for barns of latter periods. Table 1 provides a list of the barns recorded from this period.

Registration Requirements: Barns are National Register eligible under **Criterion A**, in the area of settlement, if they are associated with the first individuals to establish land claims in an area, and, in order to convey this association, the exterior design of the barn, the location, and rural setting should be unimpaired. The most distinctive exterior design characteristic is the form of the barn with its low profile and one story height. Since original cladding materials are not often found on early barns, replacement siding of vertical boards of an appropriate width, unless there is evidence of horizontal siding, is acceptable. Large non-historic openings cut into one or more exterior walls may make a barn ineligible under Criterion A depending upon the location of the openings and how they impact the character of the barn. Metal roofs, while not endorsed, have become almost a universal feature of the Linn County barn, primarily because of the expense of shingle or shake roofs. While metal is an acceptable material for the roof, metal cladding would not be desirable on a barn seeking nomination under Criterion A in the area of settlement since feeling and association would be greatly diminished by this material. Given the rarity of this property type, however, metal siding should probably be judged on an

⁵ Klein, Paul Derrall, National Register Nomination Form for the Hugh Leeper Brown Barn, Linn County, Oregon, 1978.

⁶ National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation*, U.S. Department of the Interior, National Park Service, p. 20.

individual basis since its impact on a barn will vary with siding type, color and application.

Barns are eligible for the National Register under **Criterion A**, in the area of agriculture, if characteristics are present which link the barn to early agricultural practices in the Willamette Valley. In addition to the exterior integrity threshold required for barns eligible under Criterion A, in the area of settlement, some aspects of the original interior spatial organization should be retained which link the barn to early agricultural practices.

A barn may be illustrative of a person's important achievements especially if the area of significance for those achievements is agriculture. Barns are eligible for the National Register under **Criterion B** if they are associated with the lives of persons significant in Linn County history, and maintain the characteristics by which that association is conveyed. The most important aspects of integrity for barns eligible under Criterion B are exterior design, sufficiently unaltered so that it would be recognized by the associated individual, location, and setting. A preliminary list of individuals that may have made significant contributions in the area of agriculture are listed in Appendix C.

Barns are eligible under **Criterion C** of the National Register if they exhibit the pattern of features common for barns built during this period. (Table 4 summarizes these characteristics for barns dating to each of the four periods.) Design, materials and workmanship are more important than location and setting so moved barns, and barns located in an area where the rural setting has been compromised, may still be eligible. Since one of the most important design aspects of this period is the method of construction, a barn may be significant for distinctive timber framing regardless of the integrity of other features. In this case, integrity of materials and workmanship are paramount. Because individuality and variation are hallmarks of the pioneer barn, and because this resource type is rare, remaining examples should all be considered as potential National Register properties under Criterion C with issues of integrity judged on an case by case basis.

Table 4. DISTINCTIVE CHARACTERISTICS OF LINN COUNTY BARNs 1850-1945*

*The following attributes describe the **pattern of features** common to barns constructed in each time period and is not intended to take into account all of the variability which occurs.

Characteristics	1850-1870	1870-1900	1900-1920	1920-1945
Frame Type	timber frame	timber frame	timber frame plank frame balloon frame platform frame	plank frame balloon frame platform frame
Joinery	mortise and tenon /wood pins	mortise and tenon/ wood pins	mortise and tenon/ wood pins or metal spikes lapped and let in joints/spiked nailed and spiked connections for frames incorporating dimensional lumber	nailed and spiked connections
Nail type	hand wrought machine cut (square)	generally machine cut	machine cut and/or wire drawn (round)until 1910 wire drawn after 1910	wire drawn
Timber or lumber dimensions	timbers for posts and beams 8" to 14"	timbers for posts and beams 8" x 8" most common	timbers for posts and beams of timber frame barns 6" to 8"	timbers 6" or less
Roof sheathing	waney-edged sheathing	waney-edged sheathing or skip sheathing	skip or deck sheathing	skip or deck sheathing
Siding	vertical boards, irregular dimensions often sash sawn but circular sawn lumber available by 1860s spaces between boards for ventilation	vertical boards, regular dimensions, circular sawn (8" dimension common) horizontal and vertical shiplap siding	vertical boards, regular dimensions horizontal siding	horizontal siding
Exterior finish elements	often none	sometimes corner- boards, frieze boards, drip caps, water tables, ornamental trim pieces, profiled moldings	cornerboards	cornerboards
Roof form and pitch	low gable	medium gable	medium gable gambrel	gambrel gothic

Table 4. DISTINCTIVE CHARACTERISTICS OF LINN COUNTY BARNS 1850-1945
(Continued).

Windows	rare	limited use usually along stable walls	common - windows regularly fenestrated at least on one side of the barn	common - windows regularly fenestrated at least on one side of the barn
Flooring	plank floors, irregular dimensions	plank floors, regular dimensions	plank floors regular dimensions matched flooring concrete floors	matched flooring concrete floors
Hayfork	none	interior	interior or exterior	exterior
Hay hood	none	presumably some barns began to incorporate hay hoods in their design during this period although no examples were verified from this period	common predominate type: gable extended with solid or open brackets and pointed (ridge extended)	common predominate type: pointed (ridge extended)
Grain, hay and straw storage	one level -- hay stored in hay mow on main level, straw and grain in the sheaves stored in scattered mows above drive, threshing floor, grain bins, and lean-tos	hay often stored on second floor located on either side of wagon drive (open to roof above at least a portion drive)	full second floor serves as hay mow	full second floor serves as hay mow
Form	low ridge and low eaves lean-tos for stock frequently flank one or more elevations	high ridge and high eaves lean-tos for stock	high ridge and high eaves lean-to for stock	high ridge and high eaves lean-tos sometimes incorporated for equipment storage or cow loafing single level barns for milking, loafing, equipment
Plan type	transverse plans with 4 or 5 bays predominate.	transverse and longitudinal arrangements with longitudinal plans of 3 and 4 aisles perhaps most common	transverse and longitudinal arrangements both common feeder barns	transverse and longitudinal arrangements common with three aisle plans dominating dairy barn design feed-aisle plans (wagon drive eliminated) loafing areas within envelope of the barn or in lean-to feeder barns
Dimensions	Length rarely exceeds 60 feet. Width variable from 24'-30' for barns without lean-tos and from 44'-60' for barns with lean-tos on each side elevation	Length rarely exceeds 60'. Width is from 36'-42' for 3 aisle barns and 48'-54' for 4 aisle barns	Length generally exceeds 60' after 1910	Length generally exceeds 60'.

Table 4. DISTINCTIVE CHARACTERISTICS OF LINN COUNTY BARN^S 1850-1945 (Continued).

Hardware	hand-forged	hand-forged and manufactured	manufactured	manufactured
Doors	hinged	hinged or roller	roller doors predominate	roller doors predominate
Roof Framing	Common rafter	Common rafter	Common rafter Shawver Truss Braced rafter	Shawver Truss Braced rafter Iowa Truss laminated Gothic rafters
Functional requirements	<p>hay mow</p> <p>straw mow</p> <p>areas for storage of unthreshed sheaves</p> <p>threshing floor</p> <p>grain bins for limited quantities of grain</p> <p>stalls and pens for a limited number of livestock</p>	<p>increased hay storage and means to lift the hay (bent design needs to accommodate hayfork)</p> <p>increased grain storage and less need for threshing floor because of the availability of mechanized threshing</p> <p>space to house a greater number of horses and cows</p>	<p>space to house horses and an increasing number of cows</p> <p>increased hay storage to feed the growing numbers of livestock (full second floor not interrupted above the drive for the operation of an interior hayfork and roof forms which provided more space)</p> <p>silos inside of barns or adjacent to barns to provide silage for cows</p> <p>concrete floors for milking areas with concrete gutters</p> <p>feed and manure carriers</p> <p>white washed walls</p>	<p>space to house increasing number of cows as dairying becomes more important in the county</p> <p>milk rooms</p> <p>white washed or plastered walls in milking areas</p> <p>separate milking parlors and loafing sheds</p> <p>feed and manure carriers</p> <p>horse stalls decreasing as gasoline powered equipment is adopted (equipment storage needed)</p> <p>increased hay storage to feed the cows (full second floor not interrupted above the drive for the operation of an interior hayfork and roof forms which provided more space)</p> <p>silos inside of barns or adjacent to barns for silage</p> <p>concrete floors for milking areas with concrete gutters</p> <p>grass seed bins and cleaners installed in some barns</p>
Ventilation	siding boards spaced to provide ventilation	wooden cupolas or louvers	wooden cupolas metal ventilators	metal ventilators

HISTORIC OVERVIEW

Cash Crop: Wheat Production and Expanded Agricultural Markets, 1871-1899

By 1870, harvesting grain with a cradle had become a technique of a by-gone era as wheat became a specialty crop in Linn County and vast acreages replaced the pioneer's 20-acre field. The greatest increase in wheat production in Western Oregon occurred in the 1870s.¹ Linn County's wheat production increased 250% in the period from 1868 to 1875.² In 1876, it was reported that Linn County exported more grain than any other region of the same size west of the Rocky Mountains.³ The substantial increase in wheat production was a consequence of the construction of the first railroad in Linn County; the expansion of the wheat trade to foreign markets; and the agricultural transformation wrought by a series of mechanical innovations. "From the 1860s farming operations were affected by a series of inventions arriving in fairly rapid succession and made available by the new railroads."⁴ Among these devices were mechanical hayforks, portable horse-powered threshers, gang plows, seeding drills, headers, hayrakes, which stacked hay in windrows, and hayloaders, which transported hay from the windrow to the wagon.⁵

The decade from 1870 to 1880 was one of marked development in Linn County.⁶ There was a population increase of 4,000 and grain production doubled.⁷ The number of farms in Linn County increased throughout this period: By 1880, there were 1,528 farms. This augmentation probably reflects the increase of land cleared or drained for agricultural production; the division of donation land claims as the offspring of the pioneers reached maturity; and the diversification of agriculture toward the end of this period. In the subsequent decade, the number of farms increased by 183, with the average farm 244 acres in size.⁸ Although the number of farms grew by 706 in the decade from 1890-1900, the

¹ Halbakken, David, A History of Wheat Growing in Oregon During the Nineteenth Century, (Eugene, Oregon: M.A. Thesis, University of Oregon), 1948, pp. 117-118.

² Boag, Peter Guy, The Calapooian Matrix: Landscape and Experience on a Western Frontier, Doctoral Dissertation, University of Oregon, Eugene, Oregon, 1988, p. 249.

³ Haskin, Leslie L., Agriculture File, Historical Records Survey, Work Projects Administration.

⁴ Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in Space, Style, and Structure: Building in Northwest America, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, p. 211.

⁵ Hurt, R. Douglas. American Farm Tools. (Manhattan, Kansas: Sunflower University Press), 1982.

⁶ Olsen, Charles Olaf, History of Linn County, Oregon, Work Projects Administration Writer's Program, Reprinted by L.M. Wheeler, 1982, p. 65.

⁷ *Ibid.*

⁸ Olsen, p. 65.

average farm size decreased to 203 acres. One author has noted that the last decade of the century was one during which the farmers of Linn County made slow progress.⁹ This is partially attributed to the Panic of 1893.

In 1871, the Oregon and California Railroad completed a north-south line through Linn County. Along this line, which was extended to California by Southern Pacific in 1887, a number of towns and trading centers, which also functioned as grain shipping points and regional trading centers, developed. Included were the present day Linn County communities of Millersburg, Tangent, Shedd and Halsey. Grain elevators were constructed along the railroad tracks; some, like the Farmer's Union Warehouse in Shedd, were financed cooperatively by area farmers. The town of Boston, which had grown up adjacent to the Boston Mill, literally moved to the newly platted railroad town of Shedd. Grain warehouses were still located in the river communities, however, and riverboat transport continued in the latter part of the 19th century. In 1880, the Oregonian Railway Co. completed its line through Linn County to the east of the O. and C. line. Communities on this line included Shelburn, West Scio, and Brownsville. In 1880 the Albany-Lebanon Railroad built a line from the O. and C. line in Albany to Lebanon. A large grain warehouse was erected along the tracks in Lebanon.

By 1884, Linn County wheat production surpassed 1 million bushels.¹⁰ Markets included England, British Columbia and China and, at the turn of the century, Japan and Europe.¹¹ For farmers, markets became as close as the distance to the railroad station or steamboat landing. One source noted that the county had the best shipping facilities of any county in the state: "Linn County farmers have a boat landing or railroad shipping station from 1 to 5 miles from home."¹² By 1870, there were two flour mills in Albany: Beach and Montieth, a steam operated mill, and the Magnolia Mills, a water-powered mill. Other gristmills included a Lebanon mill operated by James W. Gibson, the H.L. Turner Mill in Scio, and in the Brownsville Precinct, flour mills were operated by McHargue and Co. and R.C. Finley. In 1880 there were 4 flour mills in Albany, 1 in Scio, 2 in Brownsville, 1 in the Shedd Precinct (at Boston), 1 in Harrisburg, and 1 in Lebanon (The Elkin's Mill).

In addition to wheat, many farmers were also involved in raising other crops or livestock. "Oats and potatoes were secondary staples, while "Buckwheat, Indian corn, rye, barley, peas, and beans were less important. Individual farmers tried experimental crops on a small

⁹ Olsen, p. 66.

¹⁰ Halbakken, 64.

¹¹ Halbakken, p.

¹² Anon 1895, p. 8.

scale, such as hops, flax, sweet potatoes, sorghum, peanuts, and alfalfa."¹³ An 1895 promotional brochure for Linn County reported: "Wheat averages 22 bushels per acre with some fields yielding 40 to 50 bushels per acre. Oats, Barley, Corn, Rye, and Flax yield heavily. Potatoes yield exceedingly well on bottom lands if well-cultivated..."¹⁴

With the increasing value of wheat, the amount of land in agricultural production also increased. James Worth Morgan recalled when the whole neighborhood in the vicinity of what was later Halsey "was a wheat field".¹⁵ In order to farm this area, the land first had to be drained. Commenting on the drainage techniques on the flat plains of the Willamette, an 1877 correspondent for The Willamette Farmer, wrote:

"...the country is flat, but the farmers have an easy-going way of ditching... They plow a few furrows in the center of the sloughs, and just by waiting [,] the winter rains do the balance. I saw a few drains made in this way that were seven or eight feet wide and three feet deep, which were used as main drains into which were run one or two furrows at right angles, and this slow draining enhanced the value of the land very much."¹⁶

In his reminiscences, John Creath Bramwell noted that:

"The large watercourse, now called Spoon River, a mile or so east of Halsey, did not even exist when I was a boy. All of that region was a big slough. Spoon River began merely as a farmer's drainage furrow made with his plow. I can remember when that furrow began to wash out to make the present big channel."¹⁷

In 1897, Linn County had the top yield of wheat in its history with 1,252,620 bushels produced. By this time, however, the results of monocropping were in evidence as yields declined, and there was a period of economic malaise between the years of 1890 and 1900. It was during this period that the seeds of diversified farming were sown. An 1895 promotional brochure stated that "Owing to the large yields of wheat that has been raised to the exclusion of other crops, this has made it impossible to break up the large farms for reasonable prices. Low prices of wheat for some years has caused a change and now prunes,

¹³ Olsen, Michael Leon, The Beginning of Agriculture in Western Oregon and Western Washington, Doctoral Dissertation, University of Washington, Seattle, Washington, 1970, pp. 158-59.

¹⁴ Anon, p. 6.

¹⁵ Haskin, Leslie, L., "Interview with James Worth Morgan," W.P.A. Oral History Project, Linn County, Oregon, n.d.

¹⁶ Boag

¹⁷ Haskin, Leslie, L., "Interview with John Creath Bramwell," W.P.A. Oral History Project, Linn County, Oregon, n.d.

apples, pears, and small fruits are being produced more largely than ever before and a large acreage of hops has been planted."¹⁸ The brochure further noted that Linn County was especially adapted to diversified farming with more acreage in cultivation than any other county in the Willamette Valley.¹⁹

During the late 19th century, dairying was also establishing an economic foothold. The 1895 Linn County promotional brochure stated that stock growing and dairying "Are coming into prominence lately and with the Silo and Green Soiling a small Dairy will be a valuable adjunct of even the small valley farm; but it is in the rolling hills of the eastern central part that Stock raising and Dairying will reach perfection owing to the cheap, good land and abundance of pure flowing water."²⁰ The Scio Creamery Co. began operating in 1896 making seventy-five to one hundred pounds of butter daily with nearly a ton of milk brought to the creamery daily from the Jordan Valley area.²¹

Harvey Pugh, who lived near Shedd, Oregon, recalled that during this period "Father kept more than the usual number of cows in his locality, obtaining a start of Jerseys which later became the predominate breed of dairy cow in Linn County for many years. Dairies those days were quite small compared with such establishments now."²² In 1890, Dr. S.M. Babcock invented a method of determining the butterfat content of milk. This test resulted in dairy herd improvement on farms throughout the county since prior to the development of the Babcock test, little was known regarding the comparative value of dairy cows.²³ At about the same time, another important development for the dairy farmer was the hand or farm separator which allowed the farmer to separate the skim milk from the cream on the farm.

The hand separator revolutionized the creamery or buttermaking industry. Instead of hauling the wagonload of milk in ten gallon railroad cans to the creamery every morning, the dairy farmer may now draw milk from the cows twice daily, separate it as fast as it is milked, and feed the skim milk, still warm, fresh and sweet, to the

¹⁸ Anon, p. 2.

¹⁹ *Ibid*, p.7.

²⁰ *Ibid*, p.6.

²¹ Bates, Carol, Scio in the Forks of the Santiam. (Gates, Oregon: Susan Gauderman, Gates Graphics), 1989, p. 207.

²² Roberts and Pugh, Francis Asbury and Ruth Jessup Pugh Pioneers of 1846 in the Oregon Country, (Portland, Oregon: J.V. Hollingsworth Co.), 1959, p.92.

²³ Pirtle, T.R., History of the Dairy Industry, (Chicago: Mojonner Bros. Company), 1926, p. 79. (Reprinted 1973, Scholarly Resources, Inc.)

healthy, flourishing, young calves and pigs.²⁴

Legal supervision of the dairy industry began in 1885 when the state legislature passed an act which prohibited the sale of unclean or unwholesome milk. The act also declared it unlawful to keep cows in crowded or unhealthy conditions. The Office of Oregon State Dairy Commissioner was also established by this act.²⁵ In 1898, Southern Pacific Railroad began a 'dairy campaign' to promote the Willamette Valley as a dairying region. The success of this campaign, which enlisted the cooperation of Oregon Agricultural College, was manifest in the following decade.²⁶

During this period, agricultural improvement as an outcome of scientific investigation was advanced by the passage of the Hatch Act.

The Hatch Act, signed by President Cleveland on March 3, 1887, promoted "scientific investigation and experimentation respecting the principles and applications of agricultural science" through annual grants of \$15,000 to each state and territory, to establish agricultural experiment stations under the direction of Land Grant colleges. Seen as a way to advance agriculture in a rapidly industrializing nation, the Hatch Act created a structure of federated yet independent research institutions to solve farm problems particular to their states while building a core of basic scientific knowledge related to agriculture.²⁷

"On February 25, 1889, Governor Sylvester Pennoyer signed legislation establishing an Agricultural Experiment Station at OAC [Oregon Agricultural College] under provisions of the Hatch Act."²⁸ "By 1890, Station publications were covering a wide range of subjects, most of them centered on helping farmers solve problems of raising hogs, controlling weeds, irrigating pastureland, improving soils, selecting the right varieties, and constructing useful buildings."²⁹ In order to disseminate this information, Farmers' Institutes held in Oregon

²⁴ Pirtle, p. 83.

²⁵ Sitton, G.R., "Evolution of Public Regulation of the Market Milk Industry in Oregon," (Corvallis, Oregon: Oregon State College), Agricultural Experiment Station, Circular of Information No. 252, December 3, 1941, p. 4.

²⁶ Malboeuf, C.A., "The Railroad's Part in the Dairy Industry," Report of the 1909 Dairy Convention, on file Oregon State University Archives, pp. 39-40.

²⁷ Oregon Agricultural Experiment Station, 100 Years of Progress: The Oregon Agricultural Experiment Station Oregon State University 1888-1988, (Corvallis, Oregon: Oregon Agricultural Experiment Station), College of Agricultural Sciences, Oregon State University, 1990, p. 5.

²⁸ *Ibid*, p. 11.

²⁹ *Ibid*, p. 12.

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and around the United States were held. In 1893, nine Farmers' Institutes were held in Oregon.³⁰ Agricultural education was also promoted by the Grange movement founded in 1867 as the National Grange of Patrons of Husbandry.³¹ In Linn County the first granges were organized in the early 1870s with a single grange generally serving an area equivalent to a township.

³⁰ *Ibid*, p. 20.

³¹ Butterfield, Kenyon L., Chapters in Rural Progress, (Chicago, Illinois: The University of Chicago Press), 1913, p. 139.

Threshing Machines

"Threshing by hand flail had been short-lived, threshing by turning horses over the sheaves in the barn disappeared generally by 1870. In the 1860s and 1870s portable threshers applying horse power to a sweep took to the fields. Often the harvest was sold on the spot. By the 1880s, steam-powered threshers were in general use. With these changes, grain storage on the farm in proportion to productive acreage was no longer absolutely necessary; the barn with a threshing floor and the wheat loft vanished from new building in the 1870's, too. The barn had become more specialized, less generalized, in its function."¹

It has been noted that "In the 50 year period between 1830 and 1880, the total time necessary to produce one bushel of wheat fell from three hours and forty minutes to ten minutes."² This was the consequence of the adoption of mechanized farm equipment. In Oregon, threshing machines began replacing hand flailing and threshing in the 1860s. There were two devices, both which used horses, to power the threshing machine: the "sweep power" and the "tread power."³ "The "sweep power"...transferred the motion of circling horses to gears and shafts leading to the threshing cylinder, and the "treadmill," "tread power," or "railway power,"...utilized a simple belt system to transmit the energy expended by one or two horses made to walk an endless incline..."⁴

Based on lithographs of Linn County farms featured in Edgar Williams Illustrated Historical Atlas Map of Marion and Linn Counties (1878), the horse-sweep appears to have been more common. Of the six Linn County lithographs which illustrate threshing machines, five are operated by sweep power while only one is a tread power (Figures 25 and 26).⁵ Rikoon notes that:

The horse-sweep was the overwhelming choice of threshing machine owners prior to the widespread adoption of steam engines for threshing in the last decades of the nineteenth century....The larger units favored by travelling threshermen rode on their own wheeled carriages and contained, over the central gear, a small

¹ Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in Space, Style, and Structure: Building in Northwest America, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, p. 213.

² Hurt, R. Douglas. American Farm Tools. (Manhattan, Kansas: Sunflower University Press), 1982, p. 56.

³ Rikoon, J. Sanford, Threshing in the Midwest, 1820-1940, (Bloomington, Indiana: Indiana University Press), 1988, p. 28.

⁴ *Ibid.*

⁵ Williams, Edgar, Historical Atlas Map Marion and Linn Counties Oregon, (San Francisco, California: Edgar Williams & Co.), 1878. (Original reprinted by the Marion County Historical Society and the Friends of Historic Albany in 1976 and 1981.)

stationary platform for the "driver" or "power boss." With careful use of his whip and constant verbal encouragement, the driver's task was to keep eight to fourteen circling horses moving at the correct steady pace during the threshing.⁶

Fred Harrison noted that Robert Harrison, his grandfather, "...and three neighbors, John Nelson, Frank Troutman, and a Mr. Wright, owned one of the first horse-powered threshers in the Brownsville area. This was about 1860, and the machines operated for 20 years."⁷

Harvey Pugh recalled that:

Still another side line of my Father's was his threshing outfit...The standard practice was to "head the grain and thresh." By that I mean that the grain was permitted to stand until fully ripe and then was cut with a header which elevated it high enough that wagons could be driven along side the machine and the grain would be delivered right into the header box as it was called. The wagon was driven to the threshing machine which was stationary and the grain was pitched into the thresher which was powered by horse power or "power as it was generally called. This power consisted of a complicated system of gears which increased the speed of the eight or twelve head of horses which energized it until it drove the threshing machine for proper speed for threshing. The horses were hitched to sweeps which might be likened to a gigantic wheel lying on its side, and was turned by the horses as they walked round and round, the gears converting this slow motion up to the speed the thresher must run.⁸

While most farmers threshed with the services of traveling threshermen using sweep powers, Rikoon notes that farmers with large acreage who desired to own their own machinery favored tread powers. Farmers could also "barn thresh" in intervals throughout the winter with the aid of small tread powers placed on the floor between the grain mow and another area set aside for housing straw.⁹

By the 1880s, threshing machines began operating with steam power.

The rotary and belt power produced by the sweep and treadmill limited the speed of threshing work. In the 1870s, however, the pace of grain separation

⁶ Rikoon, p. 28.

⁷ Haskin, Leslie L. "Interview with Fred Harrison," W.P.A Oral History Project.

⁸ Roberts and Pugh, p. 93.

⁹ Rikoon, p. 39.

significantly increased as thresherman began using the...steam engine. The application of steam power to threshing was the first agricultural task in which the energy that powered the urban industrial revolution became directly visible in on-farm work.¹⁰

Robert Harrison operated one of the first steam threshing outfits in the area in about 1880.¹¹ This was a Russell machine with an eight-horse portable steam engine.¹² "The professional thresherman became especially crucial as the cost and knowledge to successfully use the latest machinery escalated far beyond the capabilities of most farmers."¹³

Improved threshing machines powered by steam engines and the growth of a capable class of itinerant operators supported a movement to drop stacking or mowing wheat in favor of summer and early fall shock threshing. Ideally each farmer could reap his grain, allow it to go through a ten-day to two week "sweat" 'in the shock, and then carry the bundles directly from the field to the threshing machinery.¹⁴

Harvey Pugh recalled that:

"About 1890 the horsepower and the little threshing machines gave way to the bigger sisters, powered with a steam engine; also the grain binder had appeared and superseded the grain header. The steam engine at first had to be moved from farm to farm with horses as well as the threshing machine. Soon, however, the engines were built to furnish their own power of moving and thus we had a "Traction Engine". At first the threshing crew boarded with the farmers they were threshing for. But this had its drawbacks, especially when the binder replaced the header for cutting the grain. With grain cut with a binder and well "shocked" the grain would not be dampened by dew or even a light rain. The men could start work much earlier and work a much longer day. In order to save the farmers' wives the inconvenience of feeding a large crew of men (twenty-five or twenty-six in a threshing crew) and make use of precious daylight the threshermen began providing themselves with the facilities necessary to board or feed the men. A large wagon was provided with a long table, cookstove, etc.

¹⁰ Rikoon, p. 58.

¹¹ Haskin.

¹² *Ibid.*

¹³ Rikoon, p. 59.

¹⁴ Rikoon, p. 60.

BARN DESIGN AND CONSTRUCTION, 1870-1899

Two women were hired for cooks and a man helper or "roust-about"...The whistle was blown at four-thirty A.M., which was the signal for the teamsters to get up and feed and harness their horses. At five o'clock the roust-about would call, "come and get it", and the grand rush for the table was on. At five-thirty the whistle was blown and a few moments later the work of the day commenced and continued without interruptions until noon...At noon the stop of an hour was needed for food and rest for the men and horses. The work then proceeded until nightfall."¹⁵

By 1881, most threshing machine manufacturers were making steam traction engines, steam tractors.¹⁶

The combine, which combines a harvester and a thresher, began to be used in the 1880s. "Large combines pulled by teams of twenty to forty horses prepared grain for market in California and the Pacific Northwest throughout the latter decades of the nineteenth century."¹⁷ At the same time, large-scale wheat production was shifting to the east side of the Cascades.

¹⁵ Roberts, Phyllis Pugh and Harvey G. Pugh, et al., Francis Asbury Pugh and Ruth Jessup Pugh Pioneers of 1846 in the Oregon Country, (Portland, Oregon: J.V. Hollingsworth Co.), 1959, pp. 93-94.

¹⁶ Hurt, p. 103.

¹⁷ Rikoon, p. 147.

IDENTIFICATION
BARNs OF THE LATE 19TH CENTURY

PROPERTY TYPE DESCRIPTION

Design, Materials and Workmanship



Figure 27. The James Alexander Smith Barn, a horse barn built in ca. 1888.

Barn design was affected by a number of factors in the period after 1870, including: a demand for increased storage space, a corollary of increased agricultural production driven by expanding markets and technological advances in machinery for planting and harvesting; the development of hay hoisting devices which permitted higher barns; increased numbers of stall-housed horses, especially draft horses, and dairy cows; and the dissemination of information on barn design which, in addition to technological and practical considerations, accentuated style and appearance. One technological advance which impacted the spatial organization of the barn was the widespread adoption of threshing machines which eliminated the need for the threshing floor in the barn and at the same time increased the need for grain storage.

The Mechanical Hayfork and its Effect on Barn Design

Perhaps the most profound change in Linn County barns during this period was barn form.

The Mechanical Hayfork and its Effect on Barn Design

Perhaps the most profound change in Linn County barns during this period was barn form. The low profile barn vanished from new construction, replaced by a barn with a high ridge and high eaves.¹ The transfiguration was largely wrought by the mechanical hayfork. Horse-powered "pitchforks" were available in the early 1860s with the first patent was issued for a harpoon hayfork in 1864.² "By 1867, three distinct varieties were in use: single forks with wood handles, grappling forks which grasped their load between two sets of tines, and harpoons which were thrust down into the top of the hay and then, when opened, exposed barbs for holding the hay as it was pulled upward. No matter the type, the fork was usually attached by rope to a pulley mounted on a cross piece in the center of the loft."³ A number of fork types are illustrated in Figure 28.

In 1867, William Loudon obtained a patent for his hay carrier which added a steel track and carrier for the hayfork (Figure 28). He advertised in the Prairie Farmer that it elevated the hay perpendicularly to any height, and then conveyed it horizontally to the back of the longest mow and returned the fork back to the load without a single effort of the pitcher.⁴ "The superiority of the hay carrier with its wooden track fixed to the roof rafters led to the quick replacement of the old horse hay-fork...Horse hay-fork brands soon disappeared from advertisements, replaced by manufacturers' versions of Loudon's hay carrier, such as Hinman, Hicks, or Kirkpatrick's horizontal carriers."⁵ The Loudon equipment magazine of 1916 noted that William Loudon was popularly known as "The Man Who Made High Barns Possible."⁶ In the mid-1870s, Rural Affairs reported that, "Since the introduction of the horse-fork, three-story barns are not so important as formerly...and barns may be built higher than before, and more room thus secured under the same extent of roof. A height of not less than 20 feet from basement walls to eaves may be adopted."⁷

While some barns in this period may have been designed so that the hay was unloaded on the

¹ Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in Space, Style, and Structure: Building in Northwest America, Ed. Thomas Vaughan and Virginia Guest Ferriday. (Portland, Oregon: Oregon Historical Society,) 1974, p. 211.

² Shannon, Fred A., The Farmer's Last Frontier: Agriculture 1860-1897, (New York: Farrar & Rinehart, Inc.), Volume V, The Economic History of the United States, 1945, p. 133.

³ Soike, Lowell J., "Affordable Barns for the Midwest: Beginnings," Barns of the Midwest, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 87.

⁴ *Ibid.*, p. 88.

⁵ *Ibid.*

⁶ Loudon Machinery Company, Loudon Barn Equipment, (Fairfield, Iowa: Loudon Machinery Company), 1916, p.15.

⁷ Thomas, J.J. Rural Affairs, Vol. VIII. (Albany, New York: Luther Tucker & Son), 1878, p. 230. (Reprint of Rural Affairs for 1876-1877-1878.)

exterior, no extant Linn County examples have been located. A lithograph of a barn with a large exterior hay door illustrated in the 1878 Williams atlas suggests exterior unloading (Figure 29).⁸ It is not known if this deficiency reflects preference for interior unloading or is simply a bias introduced by the small sample of barns from this period. Furthermore, it is difficult in many cases to firmly establish dates of construction. Many barns originally designed for interior hayforks, were subsequently adapted for exterior unloading in the early 20th century. While examples elsewhere in Oregon can be found which date to the 1890s and perhaps earlier, no barn in Linn County has been found to incorporate a hay hood, typically associated with exterior hay unloading, before 1900.

Bent Design

The hay carrier required that there be no obstructing cross beams in the way to interfere with the fork's operation. So with the increase in the height of the barn, there was also a change in bent configurations. "The mechanical fork was suspended from a track secured under the ridge and, to allow unimpaired movement of the fork loaded with hay, it was necessary to get rid of the cross girts or at least to lower them; raising the ridge - and the height of the barn - helped to achieve the desired clearance."⁹ Ways in which obstructing tie beams were eliminated included canting the purlin plate posts or removing the tie beam from upright purlin posts (Figure 30). While the bent configurations of these barns resemble the bents of barns from the mid-century, the plates are higher and these barns all have a second level. Most barns of this period, however, eliminated the secondary purlin plate posts altogether by using a post to purlin plate configuration (Figure 31).

Spatial Organization

The increase in the eave height reflects the altered interior arrangement of the barn which bore little resemblance to the pioneer barns of only a decade or two before. The hayfork and the need for additional hay storage led to the proliferation of the two level barn. "A radical change occurred in the interior, for it became two separate floors: a low ceilinged ground floor for stock...; the haymow on the upper floor reached by ladder or stair, now the dramatic, high-volumed barn space."¹⁰ At the same time, the threshing floor was no longer needed as portable horse-powered threshers, which bagged grain in the field, were in general use in the 1870s. Some periodicals of the era listed an area for the horse-power as one of the spatial requirements in the construction of a barn.¹¹ Grain bins, with an increased capacity, were often located on the first level with the stock. As in earlier barns, these grain

⁸ Williams, Edgar, Historical Atlas Map Marion and Linn Counties Oregon, (San Francisco, California: Edgar Williams & Co.), 1878, p. 59. (Original reprinted by the Marion County Historical Society and the Friends of Historic Albany in 1976 and 1981.)

⁹ Dole, p. 220.

¹⁰ *Ibid.*

¹¹ Thomas, J.J., Rural Affairs, Vol. IX, (Albany, New York: Luther Tucker & Son), 1881, p. 63. (Reprint of Rural Affairs for 1879-1880-1881.)

bins often had which could be inserted or removed from the slatted jambs according to the height of the grain (Figure 32). Often, however, doors were added over the boards in barns dating to this period.



Figure 32. Grain bin opening with boards in slatted jambs.

Based on the 1996 survey of Linn County barns, most barns in this period incorporated a wagon drive from which the hay wagon could be unloaded to lofts on either side of the drive. For interior unloading, "... the hay wagon was driven into the barn and unloaded by mechanical fork there. This required the old type of high open central wagon drive, but otherwise it, too, was floored over for a second story devoted entirely to hay storage."¹² Both transverse and longitudinal arrangements were recorded for barns of this period; in contrast to the earlier period, however, end-opening plans predominated. Side-opening or end-opening, the plans generally featured grain bins and stock aligned along a drive, in varying arrangements, often under a continuous roof line (Figures 33-37). Barn lengths recorded were generally from 40 to 60 feet, while widths ranged from 32 to 54 feet (36' to 42' for three aisle barns and 48' to 54' for four aisled barns). The single barn with the 54' width dimension, the Bond Barn built in 1883, is the only barn recorded in the county with a timber trussed roof (Figure 38). Principal rafters are located over each bent with common rafters in between resting on a principal purlin mortised into the principal rafters.

Also recorded was a single level barn plan with a two-aisle arrangement beneath the main roof -- a wagon drive flanked by grain bins. Flanking this main volume are lean-tos for stock on two, three and even four sides of the barn. Mow space is located above the grain bins and above the stables (Figure 39).

¹² Dole, p. 220.

Exterior Design

Because many barns have an interior plan with two floors, barns of this period have higher eaves, a higher ridge, and a steeper roof pitch. All barns recorded dating to this period had a gable roof often with a medium pitch. The roof line is generally not broken, with the pervasive form being the single rectangular volume for two level barns. Lean-tos were sometimes added at a later date.

During this period, a number of journals published advice on barn design and construction. "William Radford's architectural company and the Orange Judd Company began publishing more complete plans and specifications for farm houses, barns, out-buildings, and other farm structures well before the turn of the twentieth century"¹³ A catalogue of rural books published and for sale by the Orange Judd Company was located in the collections of a Linn County resident indicating that these publications were available in Linn County. The catalogue stated that "Any Book on this list will be forwarded, postpaid, to any address in the United States or Territories, on receipt of the price."¹⁴

The literature of this period reveals a growing concern for the appearance of the barn. One author attributes this to the influence of A.J. Downing noting that:

"Many formal and stylistic changes in barn construction were the result of a growing interest by landscape architects and designers in the rural environment. A.J. Downing, for example, presented the most influential case for integrating geography and architecture in a tasteful manner; for him the appropriate style was expressed in the Gothic mode. His widely-read book, The Architecture of Country Houses (1850), and those of several other followers initiated a concern among farmers and rural builders for aesthetic considerations in new and remodeled barns. As farmers responded to the growing trend toward specialization and the appeal of scientific techniques during the blossoming Victorian era, their barns were often rebuilt to the predominant contemporary fashion. Simple gable ends became mazes of vergeboard topped by finials; great doors were transformed into cathedral arches. Healthful ventilation, the desideratum of modern farming, was accomplished by capping air shafts with vents or cupolas..."¹⁵

Matched siding, sometimes only on the main facade, glazed windows, boxed eaves became more common on barns. Frieze boards and corner boards were sometimes employed. In Linn County, a number of barns dating to this period have the gable siding cantilevered slightly over the wall siding (Figure 40). Halstead, in his 1881 Orange Judd publication, Barns, Sheds and Outbuildings, illustrates many barns with ventilation cupolas, windows,

¹³ Harper, Glenn A. and Steve Gordon, "The Modern Midwestern Barn, 1900-Present," Barns of the Midwest, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 230.

¹⁴ Powell Collection

¹⁵ Rawson, Richard, Old Barn Plans, (New York: Bonanza Books), 1982, p. 14..

gable ornaments and cross gables noting that, "With the increase of wealth, and we may add of good sense and enlarged ideas, among the farmers of the country, there is a gradual but very decided improvement in farm architecture."¹⁶ Wooden ventilation "Cupolas, often in rhythmic multiples, might have been justified in practical terms but no one doubted their ability to turn the eye as well, particularly when they were dressed with gingerbread brackets and a splendid weather vane"¹⁷ Only several barns from this period in Linn County retain their wooden ventilation cupolas although it is clear from discussions with local farmers that many barns were once crowned with these elements. Other ornamentation was likely employed on barns of this period as suggested by the gable of the Morgan Barn (Figure 41).

While some farmers replaced or augmented smaller pioneer barns on existing farms, others remodeled the pioneer barn by raising the roof line. This could be accomplished by raising the plate. This alteration was observed on a number of Linn County pioneer barns. Figure 42b, below, illustrates the raised plate in the Officer Barn.

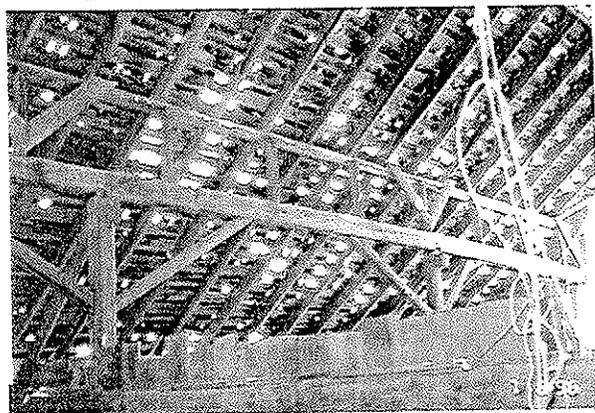


Figure 42b. Raising the roof on a pioneer barn by extending the height of the plate.

Materials and Workmanship

In addition to the design and functional differences which distinguish the pioneer barn from the barn of the latter 19th century, the barns are also distinguished by a number of differences in construction materials. Timber frame construction with mortise and tenon joinery, however, continued to be used for barns in Linn County in the latter part of the 19th century. All barns recorded from this period during the 1996 survey have a timber frame. Harvey Pugh recalled the construction of his father's barn in the late 19th century:

¹⁶ Halsted, Byron D, Barns, Shed and Outbuildings (Reprint of 1881 edition originally published by O. Judd Co.), (Brattleboro, Vermont: The Stephen Greene Press), 1977, p. 13.

¹⁷ Endersby, Elric, Alexander Greenwood and David Larkin, Barn: The Art of a Working Building, (Boston: Houghton Mifflin Company), 1992, p. 112.

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The way the carpenters cut the mortises and tenons and made the wooden pins to hold the joints together and cut the braces that were to hold the barn plum and square is in my mind still a wonderful piece of craftsmanship. This work was done not by trial and error but by accurate measurements and careful shaping. When the timbers were put together, they fitted perfectly. "Barn-raising day" was a wonderful event. Neighbors came from miles around, perhaps twenty or twenty-five, for I think father was quite popular. All went well, the joints fit perfectly and by late afternoon not only was the frame of the barn erected but many of the rafters were in place.¹⁸

The use of hewn or sawn timbers is not necessarily an indicator of age. While the vast majority barns recorded in the 1996 survey that date to this period had a sawn timber frame, there are examples of hewn timber frame barns dating to the latter part of the 19th century; for instance, all of the late 19th century barns recorded in the Jordan Valley of Linn County had hewn timber frames. Russell Rose, who lives near Lebanon, described his father's barn built in the early 1870s:

...the barn, why it was mostly of huge timbers that was hewed out, and the roof was split boards and, consequently, it didn't take much money. Probably they'd spend a good share of the winter by hewing the timbers, squaring the timbers, and they'd frame it in the spring; that is cut it out. Then they'd have a barn raising and all the neighbors from miles around would come and then they would put this together this frame, and it wouldn't take more than a day to put that barn up.¹⁹

Sawmills were located in many areas of the county at this time. Table 5 provides a list of the sawmills enumerated in the Tenth U.S. Census of Linn County (1880). The 8" x 8" circular sawn timber was common during this period for major framing members. No pole barns from the 19th century were located during the 1996 survey.

The fieldstone foundation was still typical although one barn recorded, the Rudd Barn near Peoria, employed brick piers. Sawn sills were also commonly employed on barns with sawn frames. Dimensions recorded included 12" x 8", 10" x 10", 8" x 10" and 8" x 8". Circular sawn joists were recorded for the majority of barns dating to this period. Joist size varied, however, with joists as large as 4" x 7" and as small as 2" x 8". The use of puncheon logs was recorded for several barns while hewn joists were recorded for one barn. These barns also had hewn timber frames.

The dimensions of the vertical board siding became more standardized and was often the product of circular saws. Shiplap siding, sometimes applied vertically, was also utilized. Of the 27 barns recorded from this period, 11 have shiplap siding; on six barns this siding is

¹⁸ Roberts, Phyllis Pugh and Harvey G. Pugh, et al., Francis Asbury Pugh and Ruth Jessup Pugh Pioneers of 1846 in the Oregon Country, (Portland, Oregon: J.V. Hollingsworth Co.), 1959, p. 94.

¹⁹ "It Used to be...but now...": An Oral History of Lebanon, Oregon and Surrounding Areas, (Dalton's Printing: Lebanon, Oregon), 1978, p. 3.

applied vertically and on five barns it is applied horizontally.

The dimensions of flooring, sheathing, and rafters were also affected by the availability of circular sawn lumber. The 2" x 6" common rafter appears to have been frequently used with the 2" x 4" rafter located on several barns which date near the end of the century. The use of waney-edged sheathing boards for the roof was not exclusive to the pioneer era barn but the use of skip sheathing for this purpose became common in the latter 19th century.

Nail use was limited in the framing, with pinned mortise and tenon joints still employed. Machine cut square nails were in general use, although wire drawn (round) nails were probably available beginning in the 1890s locally. Wire nails were manufactured as early as the 1850s in New York after earlier development in Europe.²⁰ "The earliest wire nails were not made for building construction, but rather in the smaller sizes for pocket book frames, cigar boxes, etc. American nail machinery was not really perfected until the 1860s and 70s. Machinery for this product was exhibited at the Philadelphia Centennial Exposition of 1876."²¹ "Wire nails did not really become the dominant type until the 1890s, and many builders preferred using cut nails well into the twentieth century. The greater holding power of cut nails was certainly a factor which delayed the quick acceptance of wire nails."²² The earliest wire nails differ from modern wire drawn nails by bulbous "heads" which are generally eccentric with respect to the shank.²³ Nails manufactured of steel wire had been in use for a number of years in America and for a longer period in Europe when it was observed in 1888 that in both places they had been very favorably received and were fast superseding the common cut-nails for many purposes.²⁴ "Wire nails did not really become the dominant type until the 1890s, and many builders preferred using cut nails well into the twentieth century. The greater holding power of cut nails was certainly a factor which delayed the quick acceptance of wire nails."²⁵ Only three barns, believed to date to the mid-to-latter 1890s, had wire drawn nails that appeared to be original. It is interesting to note that two of the three barns were built by immigrants from Germany where wire drawn nails had been used at an earlier date.

Although steel-track roller doors were manufactured as early as the 1850s, it was during this period that they began replacing hinged doors locally. The majority of barns recorded from this period had at least one roller door, or evidence of a roller door, which appeared to be original. To protect the doors from the weather, a horizontal cap a foot or more in width

²⁰ Nelson, Lee H., *Nail Chronology As An Aid to Dating Old Buildings*, *History News*, Vol. 24, No. 11, Association for State and Local History, Technical Leaflet 48, Nov. 1968, p. 9.

²¹ *Ibid*, pp. 9-10.

²² *Ibid*.

²³ *Ibid*.

²⁴ Nelson, p. 10.

²⁵ *Ibid*.

was recommended.²⁶ Roller doors are apparent on several of the lithographs in William's 1878 atlas map of Linn County including the barn of W.M. and D. Shearer (Figure 42a).²⁷

While glazed windows were recommended and illustrated in many of the periodicals of the day, window use in Linn County barns during the earlier part of this period appears not to have been common. Limited use, sometimes in the gable, is seen in a few barns in William's 1878 atlas. In lieu of glazed windows, hinged shutters or louvers were sometimes used (Figure 43). In the J.A. Smith horse barn, ventilation and light is provided by sliding sashes with vertical wooden slats; light and ventilation depend upon offset or aligned slats. By the 1890s, windows were used in some barns to illuminate the livestock aisles (Figure 34.) Diamond shaped window openings were also observed on a number of barns built around the turn-of-the-century.

Barns could also be fitted with accessories available from mail order catalogues. The 1870 edition of George E. Harney's Stables, Outbuildings, and Fences advertises iron stall guards, iron mangers, iron hay racks, iron blanket rollers, iron harness hooks and iron window guards for stables.²⁸ None of these accoutrements were found in a Linn County barn during the 1996 survey.

While stanchions were observed in a small number of barns from this period, these stanchions often dated to the 20th century, probably replacing earlier stanchions or stalls. The Cyrus Barn (1884), however, has stanchions which probably date to the 19th century; these stanchions have wood pins rather than nails and incorporate a design similar to stanchions illustrated in Rural Affairs in the latter part of the 1870s. (Figure 44).

Stalls for dairy cows were recommended during this period because it was believed that stall housing lessened the transmittal of diseases:

Individual stalls are advisable in dairy barns, as a precautionary measure to prevent to some extent the spreading of contagious diseases among the herd. Stanchions are responsible in many instances for the spreading of tuberculosis. An infected cow's breath continuously circulating around her companions' nostrils is a menace, and absolutely dangerous to the health of the herd. In individual stalls the danger from this source is not so great, as each cow is more or less separated from her companions, and with proper ventilation of the building the contamination from each

²⁶ Thomas, J.J., Rural Affairs, Vol. VI, (Albany, New York: Luther Tucker & Son), 1889, p. 76. (Reprint of Rural Affairs for 1870)

²⁷ Williams, Edgar, Historical Atlas Map Marion and Linn Counties Oregon, (San Francisco, California: Edgar Williams & Co.), 1878, p. 83. (Original reprinted by the Marion County Historical Society and the Friends of Historic Albany in 1976 and 1981.)

²⁸ Harney, George E., Stables, Outbuildings, and Fences, (New York: The American News Company), 1870.

other's breath is reduced to the minimum.²⁹

Only several barns with wooden cow stalls were recorded in Linn County during the 1996 survey project. Of course, stalls were rare generally having been removed so that the space could accommodate other uses.

Table 5. Sawmills enumerated in Linn County in the Tenth U.S. Census (1880). Almost all of the listed mills had circular saws and a number had gang saws and muley saws.

ALBANY PRECINCT

Allen Robinson and Co.
Elias Carter and Co.
Althouse and Pierce

FRANKLIN BUTTE PRECINCT

Calavarus Mill (spelling may not be correct)

LEBANON PRECINCT

Clark's Mill
Price and Nickerson
J.G. Reeds Sawmill

BROWNSVILLE PRECINCT

Conn Bros.
Wiley Andrews
David McDowell
E.P. Large
George Miller
John Conway
J.E. Lemaster
Kendig and Klafkey [Brownsville]

²⁹ "Short Course in Horticulture and Dairying," (Corvallis, Oregon: Oregon Agricultural Experiment Station), Station Circular No. 2, Nov. 1, 1897, p. 47.

Zachariah T. Bryant's Description of Building a Barn in 1876

From: "Zachariah T. Bryant, An Unpublished Autobiography of A Carpenter/Builder and Civil War Soldier." Written and Transcribed in 1935. Zachariah Bryant was a native of Indiana and a civil war veteran who came to Oregon and Linn County in 1876.

In 1876, Zachariah T. Byrant built a barn for Mr. [Alex] Settlemire.

"On the last day of May, in the afternoon, I commenced on the barn. It was 84 feet wide and 100 feet long and 20 feet high, on the eave it was over 51 feet from the bottom of the sills to the point of the rafters, took 25,000 3-foot shakes to cover it...In building the barn I had to mark every piece so I would know where it went when I was putting it together....I had one man to help me frame it. Mr. Settlemire said all he wanted was the roof on in time to put his hay in. I had made him out a bill for all the lumber for his barn and he go to the mill and get any of it that was on the bill. It was being sawed in Albany. I expected to find some mistakes when we was raising it, but there was but two little ones. One was a tie cut a foot too long, and a mortise in the wrong place. I had drawn up the plan on rainy days.

August 3rd. Today we put the bents of the barn together. It went together all right.

Friday, the 4th. Today we commenced to raise the barn. It was late before we got started. Got one bent up by noon.

The 5th, about 3 P.M. We had all the bents up and that was all we did.

Today, Friday the 18th, we been covering the barn....

Saturday, the 7th, Mr. Miller and I have been working at the barn doors today. When we get them done and hung the barn will be finished."

EVALUATION

Property Type: BARNS OF THE LATE 19TH CENTURY

Property Type Significance: Barns dating to the late 19th century in Linn County were built at a time when the county was a major wheat-producing region of the United States. These barns reflect the change from subsistence level agriculture to commercial agriculture in the Willamette Valley. New technologies, most notably the threshing machine and mechanical hayfork, combined with the completion of the first rail line in the region to facilitate this transition. With the mechanical hayfork, barns could be higher, and with the threshing machine, the threshing floor was eliminated from the barn plan. Bent designs also changed to accommodate the hayfork with post to purlin plate configurations common. Materials for barns were generally more processed and even the timbers were often the product of the local sawmill.

Barns dating from the late 19th century illustrate several major themes in Linn County history; areas of significance include agriculture and architecture. **Criterion A** of the National Register may be met by barns which reflect agriculture during this period.¹ **Criterion B** of the National Register may be met by barns that are associated with the lives of persons significant in Linn County history particularly if the individual's contributions were significant within the context of agriculture.² **Criterion C** of the National Register may be met by barns which retain enough characteristics to be considered a representative of the property type.³ A barn may also be eligible under Criterion C if it was built by a builder recognized for his consummate skill. "The work of an unidentified craftsman is eligible if it rises above the level of workmanship of the other properties encompassed by the historic context."⁴

Property Type Quantity, Quality and Condition: The 1996 survey recorded 27 barns estimated to date to this period. Not every barn from this period was recorded during the survey; nonetheless, this property type is rarer than anticipated. One of the barns, the Miller Barn (ca. 1870), was demolished shortly after it was recorded. Another barn, the Hale Barn, was already in a collapsed state when it was recorded. Several other examples were in poor condition, but, overall, the condition of barns from this period is better than the condition of barns from the mid-19th century. Because of their rarity, the integrity threshold should be less than that for barns of the 20th century.

¹ Criterion A of the National Register states that properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history.

² Criterion B states that properties may be eligible for the National Register if they are associated with the lives of persons significant in our past.

³ Criterion C states that properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

⁴ National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation*, U.S. Department of the Interior, National Park Service, p. 20.

Registration Requirements: Linn County barns may be National Register eligible under **Criterion A**, in the area of agriculture, if characteristics are present which link the barn to agricultural practices of this period. Aspects of integrity which should be present to convey this association are design, especially exterior design, location, and setting. The most distinctive exterior characteristic is the form of the barn, a singular rectangular volume with a moderately-pitched gable roof of sufficient height for a second level hay mow. Often these barns have been adapted at a later period by the addition of one or more lean-tos. Since original cladding materials are not often found on early barns, replacement siding of vertical boards of an appropriate width, unless there is evidence of horizontal siding, is acceptable. Large non-historic openings cut into one or more exterior walls may make a barn ineligible under Criterion A depending upon the location of the openings and how they impact the character of the barn. Metal roofs, while not endorsed, have become almost a universal feature of the Linn County barn, primarily because of the expense of shingle or shake roofs. While metal is an acceptable material for the roof, metal cladding would not be desirable on a barn seeking nomination under Criterion A in the area of agriculture since feeling and association would be greatly diminished by this material. Given the rarity of this property type, however, metal siding should probably be judged on an individual basis since its impact on a barn will vary with siding type, color and application. Ideally, some aspects of the original interior spatial organization should be retained linking the barn to agricultural practices of the period. The barn's location and rural setting should be intact in order to foster the associative qualities of feeling and association.

A barn may be illustrative of a person's important achievements especially if the area of significance for those achievements is agriculture. Of special interest would be barns associated with individuals that made significant contributions in the area of grain production. Barns are eligible for the National Register under **Criterion B** if they are associated with the lives of persons significant in Linn County history, and maintain the characteristics by which that association is conveyed. The most important aspects of integrity for barns eligible under Criterion B are exterior design, sufficiently unaltered so that it would be recognized by the associated individual, location, and setting. A preliminary list of individuals that may have made significant contributions in the area of agriculture are listed in Appendix C.

Because this property type appears to be rare, remaining examples are potential National Register properties under **Criterion C** if they clearly contain enough characteristics to be considered a representative of this property type. Design, materials and workmanship are more important than location and setting so moved barns, and barns located in an area where the rural setting has been compromised, may still be eligible. To be considered a good representative of the type, a barn should exhibit the pattern of features common for barns built during this period. (Table 4 summarizes those characteristics.) Since one of the most important design aspects of this period is the method of construction, a barn may be significant for distinctive timber framing; in this case, integrity of materials and workmanship are paramount. Barns may also be eligible for illustrating the variation which occurs in the property type. Barns which illustrate evolutionary or transitional characteristics may be eligible under Criterion C. For instance, prototypical barns, such as the earliest barns to incorporate a hay hood, or have Wing's joist-frame, may also be eligible under Criterion C.

HISTORIC OVERVIEW

Diversification and Experimentation, 1901-1919

In 1905, Portland led the nation in the exportation of wheat.¹ Although much of this wheat came from eastern Oregon and Washington State, Linn County was second in production in Oregon in 1900.² By then, however, yields had decreased because of soil depletion from years of raising wheat. "The initial development of agriculture was drawing to a close by the turn of the century. The success of agricultural pursuits was apparent as various agricultural industries became commercial and farmers began to specialize in the production of commercial crops. There was less emphasis on general farming practices."³ The isolation of rural communities was moderated and the exchange of information was facilitated during this period by the rural free mail delivery system, the telephone, the Good Roads Movement, and the Oregon Electric, an interurban electric railroad constructed in 1912 which enabled the farmer to ship farm products to cities on a daily basis.

Local agriculture began to diversify after the decline of the wheat market, and the period between 1900 and 1910 saw an upswing.⁴ Farmland in Linn County was valued at \$25-\$50 an acre.⁵ The number of farms in Linn County grew from 2,417 at the beginning of this period to 3,041 at the end of this period.⁶ Smaller farms could accommodate fruit and vegetable production, poultry production, and dairying which became important economic pursuits in Linn County. Field crops also were diversified. A 1904 Brownsville Warehouse advertisement gives market quotations for wheat, oats, hay, mill feed-bran, chopped wheat, chopped oats, shelled corn, oil mill and cracked corn, Timothy grass, vetch, rape, Mammoth red clover, alfalfa, rye seed, and potatoes.⁷ The M. C. Jenks Family who lived near Tangent during this period reflected this diversification. A daughter recalled that the family "...produced diversified crops: wheat,

¹ Halbakken, David, A History of Wheat Growing in Oregon During the Nineteenth Century, (Eugene, Oregon), M.A. Thesis, University of Oregon, 1948, p. 72.

² Halbakken, p. 146.

³ Carey, Charles, History of Oregon, (Portland, Oregon: The Pioneer Historical Publishing Company), 1922, pp.277-78.

⁴ Olsen, Charles Olaf, History of Linn County, Oregon, Work Projects Administration Writer's Program, Reprinted by L.M. Wheeler, 1982, p. 66.

⁵ Thirteenth Census of the United States, Reports by States, Vol. VII, p. 394.

⁶ U.S. Agricultural Census, Linn County, Oregon, 1900, 1910, 1920.

⁷ Linn County Planning Department, Brownsville Precinct Historic Survey and Inventory Project, 1990.

oats, barley, hay, apples, cherries, hogs, cream, milk, and eggs."⁸

Dairying became much more important in Linn County and the state, reportedly due in part to the successful "dairy campaign" begun in 1898.⁹ This campaign was continued during the early years of the century by Southern Pacific Railroad. The company: reduced rates on the shipment of high-bred stock into the region; worked closely with Oregon Agricultural College, bringing farmers to Corvallis to attend Farmers' Institutes; established reasonable rates for the transport of milk cans; and operated demonstration trains through the state from which Dr. Withycombe of Oregon Agricultural College lectured to farmers.

The formerly simple system of milk production for family use and sale within the community began to shift to a complicated industry in which milk was shipped long distances, the milk from many herds mixed together and divided among customers.¹⁰ "This change in the marketing system occasioned by the change from a rural to an urban economy brought into existence many new problems, the most important of which was milk sanitation."¹¹

In 1905, Oregon began differentiating milk produced for fluid consumption from milk produced for butter and cheese. This led to the distinction between a Grade A dairy and a Grade B dairy. Sanitary requirements for the production and handling of milk for the fluid trade were much more rigid, and persons maintaining cows for the purpose of fluid consumption in cities of 10,000 or more had to apply annually for a certificate of inspection. This certificate could be revoked if proper sanitary conditions were not maintained in the stables, buildings, or grounds where the cows were kept.¹²

Dairying led to a greater diversity of products than any other branch of farming, due to the requirement for forage feed. Clover and vetch, which enrich the soil, were grown and crop rotation created good pasture for sheep and cattle. Creameries were established in many Linn County communities and in nearby Corvallis and Stayton. In 1901, farmers could sell their cream to the Corvallis Creamery, the Jersey Creamery (both in Corvallis), the Albany Creamery, the Plainview Creamery, the Scio Creamery and the

⁸ "On the Farm," Albany Democrat Herald, Albany, Oregon, Friday, March 26, 1993, p. 34.

⁹ Malboeuf, C.A., "The Railroad's Part in the Dairy Industry," Report of the 1909 Dairy Convention, on file at Oregon State University Archives.

¹⁰ Sitton, G.R., "Evolution of Public Regulation of the Market Milk Industry in Oregon," (Corvallis, Oregon: Oregon State College, Agricultural Experiment Station), Circular of Information No. 252, December 3, 1941, p. 4.

¹¹ Sitton, p. i.

¹² *Ibid.*

BARN DESIGN AND CONSTRUCTION, 1900-1919

Brownsville Creamery. There were also a number of skim milk stations, including ones at Tangent, at Shedd, and at Stayton in nearby Marion County.¹³ The Shedd Creamery Co. was established in 1913.

In 1907, the Linn Condensed Milk Co. was incorporated, and, in 1910, the Scio Condensed Milk Co. was incorporated.¹⁴ The label of the condensery was "Country Club Milk".¹⁵ In 1915, the Scio Tribune reported: "The Scio condensery shipped a car of milk to San Francisco this week. This is the first shipment to the California metropolis...Between 9,000 and 10,000 pounds of milk is being received daily at the condensery."¹⁶ During the peak days of the company, Scio was referred to as the "Dairy City of the Willamette Valley".¹⁷

During this period farmers could sell their milk to several cheese factories in Linn County; two of them were located near Scio. The Richardson Gap Cheese Co. was established in 1918.¹⁸ The factory burned to the ground in 1922 and was never rebuilt; while it operated it was producing 600 lbs. of cheese daily.¹⁹ A number of the incorporators were of Czech descent, including John Shimanek and Joe Bartu. In the 1910s, the Jordan cheese factory was operating on Thomas Creek in the community of Jordan. In July of 1919, the factory was manufacturing 1000-1100 lbs. of cheese daily. The product of the factory was known as "Willamette Cheese".²⁰

In 1908, The first cow testing association in Linn County was organized at Peoria. The association was formed to test cows to generate scientific data on milk and cream production at various times of the year. By December 1908, there were five associations in Oregon with three in Linn County centered in Peoria, Shedd, and Crabtree.²¹ This is of note since a book entitled the History of the Dairy Industry, published in 1926, states

¹³ Kent, F.L., "Creameries and Cheese Factories of Western Oregon," (Corvallis, Oregon: Oregon Agricultural Experiment Station), Bulletin No. 65, January. 1901.

¹⁴ Articles of Incorporation, Linn County, Oregon, Vol. 2.

¹⁵ Bates, Carol, Scio in the Forks of the Santiam. (Gates, Oregon: Susan Gauderman, Gates Graphics 1989), p. 208. Bates, p. 208.

¹⁶ The Scio Tribune, Scio, Oregon, June 24, 1915, p. 4.

¹⁷ Bates, p. 209.

¹⁸ Linn County Oregon, Articles of Incorporation, Vol. 2.

¹⁹ Bates, p. 210.

²⁰ Bates, p. 210.

²¹ Report of the 1908 Dairy Convention, pp. 49-50.

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that the first cow-testing association in the United States was organized only three years earlier, in 1905, in Michigan and that the first testing began in 1906. In 1940, there were only forty such associations in the United States.²² Apparently, Linn County was progressive in this area. Nonetheless, one speaker at a 1909 dairy convention stated that he believed "nowhere are conditions more backward than in Oregon and Washington".²³

The 1910s were extremely prosperous as war-torn Europe demanded American agricultural products. From 1914 to 1919, overall crop prices more than doubled. As a consequence of this boom, a contemporary publication noted that:

Development in farm buildings in the years since 1910 has been rapid and continuous. Farming communities have become prosperous, and since the fundamental improvements of clearing, drainage and tillage have been largely accomplished, more money is available for buildings. Land values have risen, and the owner is now justified in putting more improvements on the farm.²⁴

In 1916, the Federal Farm Loan Act was passed. The Farm Loan banks created by this act were authorized to lend sums at a low interest to cooperative farm-loan associations on the security of farm lands and buildings.

World War I also led to a worldwide shortage of horses. As early as 1915, *Scientific American* predicted that an "enormous drain on America's horse supply...will hasten the adoption of tractors hitherto accepted with some hesitation."²⁵ This shortage even affected the remote far west. The *Scio Tribune* reported: "About 14,000 horses have been sold in the northwest to be taken for war purposes to England and France. About one-half of the number were bought in western Oregon."²⁶ In other articles, the *Scio* newspaper noted: "A horse buyer from Kansas City, Mo., was in town Tuesday, wanting to buy heavy, chunky horses for the English army"; and, "Quite a number of horses were brought into town Tuesday, to be sold for transportation to the French government, many of which are not the quality of horses the bills call for."²⁷

²² Pirtle, T.R., *History of the Dairy Industry*, (Chicago: Mojonier Bros. Company), 1926, p. 69. (Reprinted 1973, Scholarly Resources, Inc.)

²³ Klock, H.L., "Improving the Condition of the Dairy Farm," Report of the 1909 Dairy Convention, p. 39. On file at Oregon State University Archives.

²⁴ Foster, W.A., and Deane G. Carter, *Farm Buildings*, (New York: John Wiley and Sons), 1922. p. 2.

²⁵ Williams, Robert, C., *Fordson, Farmall, and Poppin' Johnny: A History of the Farm Tractor and Its Impact on America*, (Urbana and Chicago: University of Illinois Press), 1987, p. 43.

²⁶ *The Scio Tribune*, *Scio*, Oregon, July 15, 1915, p. 4.

²⁷ *Scio Tribune*, *Scio*, Oregon, April 15, 1915, p. 4, and April 8, 1915, p. 4, respectively.

BARN DESIGN AND CONSTRUCTION, 1900-1919

The shortage of horses in this country during the war is believed to have accelerated the adoption of the tractor. In the period prior to World War I, tractor makers experimented with basic design concepts.²⁸ Ford began mass-producing the Fordson tractor during the war, and mass-production combined with a price war between Ford and Harvester "lowered the price of tractors to the point where a tractor cost 'less than the price of a good team of horses'".²⁹ Fordsons were of questionable value, however, because of their inability to be used on row crops, and because they were too large and too expensive for smaller farms.³⁰ In 1919, one author stated: "Much as the tractor is needed on a very large percentage of farms, the time will probably never come when horses will cease to be needed to do farm work. In other words, the tractor has come to supplement animal power, not to *displace* it."³¹ He continued: "The tractor has its advantages over the horse and vice versa. It is not subject to death, and if it breaks down, it can be replaced piecemeal for a time. Yet it does not reproduce itself as does the horse..."³²

While the gasoline-powered tractor was still a few years in the future for most farmers, threshing and similar jobs created a market for a large number of steam engines in agriculture between 1885 and about 1920, with steam power at its peak in 1910.³³ A photograph of a Barrett Bros. threshing crew, taken in 1902, illustrates a steam-powered tractor driving the belt for a threshing machine.³⁴ Small portable combustion engines made their debut in the early 20th century.³⁵ In 1914, Blatchford Bros. of Shelburn advertised the Sterling thresher combined with an I.H.C. gasoline engine. The advertisement pointed out: "When threshing is over, you can dismount the thresher and mount a saw in its place. Or, you can belt the 4 or 6-horse power engine to a pump, corn sheller, grinder, etc."³⁶

During this period, agricultural education was promoted by several pieces of legislation.

²⁸ Williams, p. 86.

²⁹ *Ibid*, p. 55.

³⁰ *Ibid*.

³¹ Seymour, E.L.D. (ed.), Farm Knowledge, Vol. III: Farm Implements and Construction, (New York: Doubleday, Page & Company for Sears, Roebuck and Co.), 1919, p. 57.

³² *Ibid*, p. 59.

³³ Williams, p. 10.

³⁴ "Barrett Bros", Albany Democrat Herald, Friday, March 26, 1903, p. 36.

³⁵ Williams, pp. 35-36.

³⁶ The Stayton Mail, April 30, 1914.

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By 1902, 2,700 Farmers Institutes around the nation had attracted 800,000 farmers and their wives. These institutes eventually led to the establishment of the Cooperative Extension Service. The Oregon Extension Service was established in 1911, and, in 1914, the Smith-Lever Act gave major congressional support to extension work throughout the United States.³⁷ This act provided for the expansion of agricultural extension work under the direction of the state agricultural colleges.³⁸ The Smith-Hughes Act, passed in 1917, encouraged the teaching of agriculture in high schools.³⁹ In addition to providing crop and livestock information, "The extension service departments of most agricultural colleges and college departments of rural economics or farm management, agricultural engineering or farm mechanics, and horticulture or landscape architecture also offered advice on the arrangement of farm building groups."⁴⁰

It was now more common for farmers to have had training at a state agricultural college; at this time, Oregon Agricultural College in nearby Corvallis was the largest agricultural college in the United States in proportion to state population.⁴¹ The daughter of M.C. Jenks recalled that:

After attending Oregon Agricultural College, now Oregon State University, Jenks liked to try progressive farming methods such as spraying, fertilizing and experimenting with new crops. He bought the first land plaster machine in the Tangent area....land plaster contained sulfur and was used as a stimulus for legumes like the clover crop Jenks grew to return nitrogen to the soil. By loaning the land plaster machine to his neighbors, Jenks contributed to the soil enrichment program throughout the area.⁴²

³⁷ Oregon Agricultural Experiment Station, 100 Years of Progress: The Oregon Agricultural Experiment Station Oregon State University 1888-1988, (Corvallis, Oregon: Oregon Agricultural Experiment Station), College of Agricultural Sciences, Oregon State University, 1990, p. 24.

³⁸ Harper, Glenn A. and Steve Gordon, "The Modern Midwestern Barn, 1900-Present," Barns of the Midwest, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 229.

³⁹ *Ibid.*

⁴⁰ *Ibid.*

⁴¹ Klock, p. 39.

⁴² "On the Farm", Albany Democrat Herald, Albany, Oregon, Friday, March 26, 1993, p. 34.

TABLE 6. List of Linn County members of the Oregon Dairymen's Association Reports of the Annual Meetings 1903-1908.

Wm. Allingham	Shedds
N.H. Bateman	Shedds
Peter Bithers	Albany
J.C. Brown	Shedds
F.A. Bruckman	Brownsville
Jas. Carothers	Shedds
George Cline	Albany
George Cochran	Albany
S. Freerksen	Albany
S. Froman	Albany
Thos. Froman	Albany
W.A. Kimsey	Albany
J.A. McBride	Shedds
McConnell Bros.	Shedds
W.B. McCormick	Shedds
M. McCroskey	Albany
John Myer	Crabtree
J.M. Philpott	Harrisburg
W.W. Polland	Shedds
F.H. Porter	Halsey
George C. Porter	Shedds
J.W. Pugh	Shedds
E.F. Rice	Albany
C.R. Schiller	Halsey
Ed Schoel	Albany
E.J. Seeley	Albany
C.L. Shaw	Albany
H.B. Sprenger	Albany
Edwin Stone	Albany
C.H. Stewart	Albany
W.A. Thrift	Shedds
Clyde Beach	Shedds
A.C. Miller	Albany
R.L. Burkhart	Albany
J.N. Connett	Lebanon
L.L. Connett	Lebanon

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TABLE 7. List of some creameries and cheese factories which served Linn County farmers in the period 1900 to 1919. (This is not a complete list.)

Albany

Albany Butter and Produce Company
Albany Creamery Association
Grand Prairie Creamery

Brownsville

Bruckman and Son Creamery (Brownsville Creamery)

Lebanon Vicinity

Lebanon Creamery
C.H. Vehrs creamery
L.R. Cheadle cheese factory
Plainview Creamery

Corvallis (Benton County)

H.W. Kaupisch creamery
Jersey Creameries
Corvallis Creamery
F.O. Wilcox cheese factory

Scio

The Jordan Cheese Factory
The Richardson Gap Cheese Co.
The Scio Creamery
The Scio Condensed Milk Company

IDENTIFICATION BARNs OF THE EARLY 20TH CENTURY

PROPERTY TYPE DESCRIPTION

Barn Design and Function

"...application of the principles of the industrial revolution made barn construction more practical and economical, but at the price of local diversity"¹

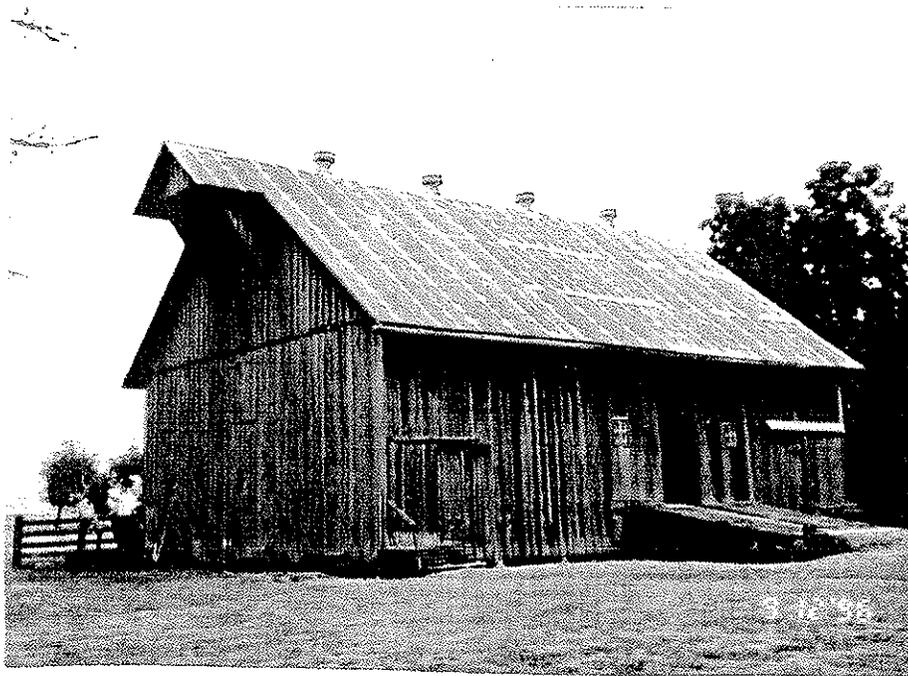


Figure 45. The Miller Barn, built in 1911.

Between the turn of the century and the end of World War I, agriculture and barn building in Linn County were in a transitional phase. During this period, barn construction and design began to shift from vernacular designs to standardized designs that were disseminated nationwide. While some farmers adopted modern, lighter framing techniques, others continued to build conventional timber frame barns. There also appears to have been a good deal of experimentation in the interpretation of new barn building concepts. It has been suggested that, "If a single theme characterizes twentieth-

¹ Endersby, Elric, Alexander Greenwood, and David Larkin, *Barn: The Art of a Working Building*, (Boston: Houghton Mifflin Company), 1992, p. 114.

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century barn construction, and agriculture in general, it was experimentation. Indeed, the period from 1890 to 1920 was marked by great innovation and experimentation in farm building design...² In Linn County this period seems to begin nearer to 1900. Factors contributing to change in Linn County barn design during this period included: lighter framing systems and the adoption of the gambrel roof; the rise of dairying as a primary economic pursuit; the incorporation of the hay hood in barn design; greater exposure to new ideas disseminated by the extension service, agricultural experiment stations, farm periodicals, and pattern books; and the proliferation of mail-order farm equipment companies.

It has been observed that, "With few exceptions engineers and researchers at agricultural experiment stations had ignored the study of barns and their improvement during the nineteenth century. Farm structures began attracting some interest, however, during the opening decade of the new century, stimulated in part by the studies of Franklin H. King of the Wisconsin Agricultural College and Experiment Station."³ During this period the Regional Plan Service was developed through the cooperation of a number of federal and state agencies. The United States was divided into four principal geographic regions -- northeastern, north central, western, and southern states. The plan service of each region was conducted cooperatively by the United States Department of Agriculture, the state extension services, and, in some states, by the Agricultural Engineering Departments of state colleges. Two stated purposes were the standardization of farm building construction in a given geographical area, and the dissemination of plans and information on farm building construction.⁴ One writer noted: "Thus a farmer who wants a plan for a particular farm building can consult the catalogue in his county agent's office, and through the county agent, order the standard plan from the state extension service."⁵

In addition to plans provided by educational organizations, there was a proliferation of agricultural journals, pattern books, mail-order catalogs, and other product dealer and manufacturer promotions.⁶ In 1914, the James Manufacturing Co. advertised its barn planning service. A free barn building book was also offered.⁷ Barns were a major part of the sales operations of two Iowa firms -- the Loudon Machinery Company and

² Harper, Glenn A., and Steve Gordon, "The Modern Midwestern Barn, 1900-Present," *Barns of the Midwest*, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press, 1995), p. 213.

³ Soike, Lowell J., "Within Reach of All: Midwest Barns Perfected," *Barns of the Midwest*, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, pp. 157-158.

⁴ Gray, Harold E., *Farm Service Buildings*, (New York: McGraw-Hill Book Company), 1955. p. 29.

⁵ Gray, p. 30.

⁶ Harper and Gordon, p. 215.

⁷ *The County Gentleman*, Jan. 10, 1914.

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Gordon-Van Tine company.⁸ "Louden began its self-proclaimed 'first free planning service' in 1907."⁹ "Headquartered in Fairfield, Iowa, its catalogues, filled with sample plans and available farm equipment, invited farmers to simply 'tell us about what you have in mind in the way of a barn' and then 'we'll draw you a floor plan giving you our recommendations' without charge."¹⁰ The Loudon Machinery Company had an architectural department, described as follows:

No other organization of architects is so well equipped to give you expert advisory service and practical barn plans as the Architectural Department of the Loudon Machinery company. Unlike most architectural concerns, its services are limited strictly to one line of work. Agricultural Architecture. Every man on the staff is a Farm Building Specialist. As a result, they are more competent to advise you on your farm building problems than any organization of general practicing architects. Our staff of skilled architects and builders is supplemented by an auxiliary of 75 practical field men who know barns from basement to ridgepole. There is probably a field man in your territory. Write us about your building plans and we will have him see you, if possible and talk the matter over with you. There's no expense --no obligation.¹¹

"The Gordon-Van Tine Company of Davenport, Iowa, advertised its plan services less as a way to sell barn equipment and supplies than to help sell pre-cut barns along with their ready-cut homes."¹² Barns also appeared in Sears, Montgomery Wards, and Aladdin catalogues.¹³

There was also a selection of plan books which included: Barn Plans and Outbuildings by E. Powell (1903); Sanders Publishing Company's Farm Buildings (1907); Modern Farm Buildings by Alfred Hopkins, Orange Judd Company's Barn Plans and Outbuildings, (1907), a slightly updated version of their 1881 plan book; William Radford's Practical Barn Plans, (1909); Farm Structures by K.J.T. Ekblaw (1914); Herbert A. Shearer's, Farm Buildings with Plans and Descriptions (1917); and Armstrong H. Robert's, The Farmer His Own Builder (1918).

⁸ Soike, p. 158.

⁹ *Ibid.*

¹⁰ *Ibid.*

¹¹ Loudon Machinery Company, Loudon Barn Equipment, (Fairfield, Iowa: Loudon Machinery Company), 1916, p. 217.

¹² *Ibid.*, p. 159.

¹³ Soike, p. 158.

Perhaps the most noticeable change in barn design was the shift from the gable roof forms of the 19th century to the gambrel roof. The gambrel roof was not new at this time. An 1881 issue of *Rural Affairs* noted that, at that time, the external appearance of the curb [gambrel] roof was not in favor and "This mode of building has consequently nearly passed out of use."¹⁴ The gambrel roof's ascent to popularity was a response to the need for more hay storage, a corollary of increased dairy activity and horse-operated mechanical equipment, and the acceptance of light barn framing. Light framing allowed for braced and trussed roofs that provided overhead storage of hay and feed without interference from supporting members.

In this new era of balloon framing and self-supported roofs, the gambrel roof soared in popularity. Earlier called the curb roof, it had been around and growing in numbers during the latter half of the nineteenth century, encouraged by greater height and storage possibilities offered by the hay carrier. But its reputation for spreading rafters and settling roofs had denied it widespread popularity during these years....The gambrel roof accompanied light-construction methods to the forefront of popularity.¹⁵

Philip Dole has noted: "...the gambrel-roofed dairy barn or all-purpose barn appears to have developed in the 1890s, vigorously supported and developed by state agricultural colleges throughout the nation which built huge examples of the form, often in group complexes and with long, low one-storied cowsheds attached to them."¹⁶ Data from the 1996 survey indicate that in Linn County the gambrel roof form made its appearance in the first decade of the 20th century and became common in the 1910s. Overall, however, the gable roof still appears to have been predominate, especially during the first decade. A pre-1910 date was established for only one gambrel-roofed barn in the county during the 1996 survey; that barn was built in 1909. Surely some of the other undated gambrel-roofed barns may have been built in the first decade. The deficiency of gambrel roof barns recorded from that decade probably reflects the small sample size, the bias in selecting barns to record (gable-roofed barns probably were looked at more closely because they are associated with the 19th century), and, the difficulty in establishing firm dates of construction.

The variety and combination of barn framing techniques is one of the characteristics of the period 1900-1919. The timber frame, the plank frame, the pole frame, the balloon

¹⁴ Thomas, J.J., *Rural Affairs*, Vol. IX, (Albany, New York: Luther Tucker & Son), 1881, p. 273. (Reprint of *Rural Affairs* for 1879-1880-1881.)

¹⁵ Soike, Lowell J., "Within Reach of All: Midwest Barns Perfected," *Barns of the Midwest*, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 157.

¹⁶ Dole, Philip, "Farmhouses and Barns of the Willamette Valley", *Space, Style, and Structure: Building in Northwest America*, Eds. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, pp. 225-226.

frame, and the platform frame were all used during this period. Barn building conventions of the 19th century persisted into the early 20th century. Timber frame barns predominated at this time (See Table 8). Bent designs varied, with many barns incorporating the same designs used in barns dating to the 19th century (Figures 46 and 47). While Wing's joist-frame was promoted nationally in the 1890s, this frame configuration was recorded during the 1996 survey only in barns built in the first decade of the 20th century (Figure 48); however, timbers, rather than the usual plank dimension lumber, were employed.

While the majority of timber frame barns recorded for this period had gable roofs, timber framing was also used for early gambrel-roofed barns. The gambrel roof in a timber frame barn was generally supported by tall timber purlin posts extending from the loft floor to the purlin plate. Early examples in Linn County are not always conventional, however; a number of designs for achieving the gambrel form were employed (Figures 49 and 50). Timber framing was also combined with braced rafter and trussed roof designs. The Hoefer Barn (ca. 1915), has a timber frame, mortise and tenon joinery, and a braced rafter roof (Figure 51). Built about the same time, the Kelly Barn (ca. 1912) has stud wall construction combined with a gambrel roof incorporating timber purlin posts (Figure 52). By the second decade of the century, the gambrel form was commonly achieved either by the Shawver truss which was a plank truss design, or by a braced rafter system which incorporated light trussing on each pair of rafters (see section entitled *Truss Innovations*).

The increased need for hay storage made interior hay unloading improvident since the loft floor was open above the drive. Unloading hay from the exterior of the barn allowed an uninterrupted loft floor and, therefore, more storage space. Of the forty-six barns recorded during the 1996 survey that date to this period, thirty-seven were designed to unload hay from the exterior of the barn while nine were designed for interior unloading. Seven of the nine barns that retained interior unloading also had gable roofs. On the other hand, there were many gable-roofed barns with exterior hay doors.

Spatial Organization

The prominence of dairying at this time increased the dairy herds in the county with more space allocated in barns for this function. The milk room and milkhouse also appeared during this period. In the milk room, milk from pails was poured into milk cans. Additionally, it provided an area to keep scales and records, and to wash hands. "The real reason for this room is to provide a place that may be kept free from flies, odors and dust."¹⁷ In many areas of the country, a milkhouse, separated from the barn, was required by law.

¹⁷ Hopkins, Alfred, *Modern Farm Buildings*, (New York: McBride, Nast & Company), 1913, p. 27.

Milk was originally stored in springhouses, but government regulation and improving commercial standards forced an improvement in milk cooling methods. Specifically, milk must now be cooled to 50 degrees or lower within a few hours of milking to prevent bacterial growth...the milk house is an unmistakable trademark of the dairy farm. Located as close as possible to the barn itself, it is often an appendage of the barn. By law, however, the milk house must be separated from the barn for sanitary reasons.¹⁸

The tractor was still in a developmental state at this time, so that horse stalls remained an important consideration in barn design.

During the 1996 survey, barns with transverse arrangements and barns with longitudinal arrangements from this period were found in almost equal numbers. Transverse arrangements from three to six bays were recorded. Three-bay designs usually incorporated a central wagon drive, with cows on one side and horses on the other side (Figure 53). A four-bay plan common at this time had a wagon drive in an interior bay flanked by grain bins. Outer bays were for horse stalls and cow stanchions (Figures 54). Although a similar five-bay plan was recorded, the use of the extra bay was not determined (Figure 55). In the six-bay plan, the extra drive was used for wagon and equipment storage (Figure 56). The loft of this barn was divided in two with one half used for straw and the other used for hay.

A three-aisle barn with a central wagon drive flanked by livestock stanchions, stalls, pens, and grain bins in varying arrangements was a common longitudinal plan (Figures 57 and 58). Bank barns having this arrangement also were recorded from this period with the cow stanchions located in the basement level (Figure 59). As would be expected, bank barns in Linn County are generally found only in the hilly portions of the county or in areas where terraces of the Willamette River provide the needed bank.

A four-aisle longitudinal plan, similar to that described for 19th century barns, persisted during this period (Figure 60). Automobile storage was sometimes incorporated into the design. In some barns, a feed aisle replaced the wagon drive, no longer essential when hay was loaded from the exterior of the barn (Figure 61).

Several three-level, non-bank barns were recorded during the 1996 survey. The only access to these barns is on the main level; the second level is gained only by stair or ramp in the interior of the barn (Figure 51). Sheep were housed on the second level of the Hoefler Barn.

¹⁸ Noble, Allen G. and Richard K. Cleek, The Old Barn Book: A Field Guide to North American Barns and Other Farm Structures, (New Brunswick, New Jersey: Rutgers University Press), 1995, p.140.

Feeder barns were also recorded during this period. These barns have a central area open from floor to ceiling for hay. Live stock aisles flank the center hay bay on both sides. There are no drives; A pedestrian entry is located in the center of a gable end and usually accesses a room with a grain bin or two (Figure 62).

The only observed barns with overhangs in the county were built in the area south of Stayton during this period. The earliest appears to have been the Michael Ryan Barn built in 1910. Michael Ryan hailed from Pennsylvania; This barn can be classified as a Pennsylvania Barn based on its forebay overhang and plan. The Ryan Barn is the only example of a Pennsylvania Barn in Linn County. (See chapter on Ethnic and Religious Immigration, Figure 120.) A very short distance from the Ryan Barn is the Aegerter Barn. This barn, built in 1915, has a four-sided overhang, a design that may be related to the Aegerter's Swiss background. The Aegerters hailed from Canton Bern where buildings with four-sided overhangs are common. Also nearby is a barn with two-sided overhangs built by the Sandner Family, a Linn County pioneer family. The overhangs were incorporated into the design of the barn to protect the stable doors from the elements (Figure 56).

Materials and Workmanship

Materials and workmanship during the early years of the 20th century mirror the transitional character of barn construction and design at that time. Concrete, plank dimension lumber, wire-drawn nails, and nailed connections were embraced by some builders, while others clung to the traditional materials and workmanship of the 19th century.

The turn of the century ushered in a new or rediscovered building material which eventually had a significant impact on barn construction. The Portland Cement Association reported that concrete allowed farmers to make their farms "...rotproof, ratproof, rustproof, windproof, fireproof, and as nearly expense-proof"¹⁹ In Linn County, the first use of concrete in barn construction appears to date to the first decade of this century. The earliest use may have been for concrete piers that could substitute for fieldstones. During the 1996 survey, a number of barns were recorded dating to the first decade of the 20th century that incorporated concrete piers. The earliest recorded barn with a concrete perimeter foundation and a slab-on-grade floor dates to 1910. During this period, however, many farmers who adopted the concrete perimeter foundation continued the tradition of a wood floor. Table 9 summarizes the foundation types of the 45 barns recorded from this period. When a concrete floor was used, it was advised that in the areas where animals walk, the concrete should have a

¹⁹ Portland Cement Association, Concrete on the Dairy Farm, (Portland Cement Association), n.d., p. 3.

float finish to prevent animals from slipping.²⁰

In barns where wood poles or posts came in contact with the ground, the wood was sometimes treated. When the Richard Struckmeier Barn was built in 1918, bark was left on the posts that extended below the ground. The posts were bored and a solution of arsenic and salt was inserted. The holes were then corked.

Although some of the literature of the period advocated the plank frame for barn construction, only two plank frame barns were recorded during the 1996 survey.²¹ Since timber scarcity was a reason for adopting the plank frame, the apparent scant employment of the plank frame in Linn County may have been related to the locally abundant timber resources; The large number of timber frame barns from this period attests to the availability of timber. Plan books dating to the first decade of the 20th century, such as Radford's Practical Barn Plans (1909), Farm Buildings, published by the Sander's Publishing Co. in 1907, and Barn Plans and Outbuildings published by the Orange Judd Company also in 1907, include numerous plans for timber frame barns. Based on the findings of the 1996 survey, the earliest examples of barns with stud wall framing date to ca. 1910. Barns of this period having the lighter balloon or platform framing also have plank truss roof systems.

While timbers for framing barns continued to be used in the early 20th century, the size of the timbers diminished. The 8" x 8" timber was still used in some barns, but, more commonly barns were constructed with 6" x 8" or 6" x 6" timbers. As the size of the timbers diminished, so too did the use of mortise and tenon joinery. Even when mortise and tenon joinery was used for posts and beams, toenailing was often used for brace and wall girt joints. (Toenailing is the practice of driving nails at an angle into the side of one piece, close to the end, so that they extend into a second member at right angles.) In many cases, mortise and tenon joinery gave way to simpler let-in, lapped, notched or halved joints with nails and spikes replacing wooden pins (Figures 63 and 64). In some cases, even when the mortise and tenon joint was retained, the wood pin was replaced by a spike. Pole barns also were being built in the early 20th century, some with mortise and tenon joinery (Figure 65).

Although timbers were generally sawn, several hewn timber frame barns were recorded. The bent configurations of these barns were similar in design to Wing's joist-frame, but with timbers rather than plank dimension lumber. Timbers were connected with mortise and tenon joinery, but the 2" x 7" braces were spiked into place. The hewn posts were 8" x 8".

²⁰ Hopkins, Alfred, Modern Farm Buildings, (New York: McBride, Nast & Company), 1913, p. 46.

²¹ There may be other examples. Interiors of approximately 147 barns were recorded and only one plank frame barn was located in this sample.

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In the first decade of the 20th century, both wire drawn (round) and machine cut (square) nails were used. Although several Linn County barns dating to the mid-1890s appear to have originally incorporated wire drawn nails, the widespread use of these nails in Linn County barns dates to the first decade of the 20th century. By the 1910s, the wire drawn nail was the standard.²²

Barn siding varied during this period. Generally, timber frame barns had vertical board siding, while barns with stud wall construction had horizontal siding. Of the timber frame barns recorded during the 1996 survey, approximately two-thirds with vertical siding incorporated battens. Both plain and shaped battens were used during this period. All of the barns surveyed with stud wall construction had horizontal siding, with horizontal drop siding favored. V-match siding was observed on several barns. Two timber frame barns from this period also had horizontal drop siding.

With a greater emphasis on sanitation during this period, new materials were promoted for the interiors of barns used for dairying activities.

The material for the interior surface of the cow barn is selected with a view toward the elimination of all wood. Even in a wooden structure the interior walls can be entirely covered with non-absorbent materials, which render it possible to make a wooden building just as sanitary as one of masonry. To get this result it is necessary that the walls to the height of...4 ft. above the floor...be plastered in Portland cement...forming a cement dado all around the building. This cement dado...is best put on galvanized iron lath. Above this point the walls and ceilings are plastered in the usual manner but finished with some hard substance, such as Keene's cement...All offsets in the plastering should be carefully avoided and 3-in. coves run at all interior angles...²³

The doors...are better if sheathed smooth on the inside than paneled in the ordinary fashion. The idea of doing away with all dust-catching projections should be carried out even to the very smallest detail...even the muntins in the window sash are designed without moldings...²⁴

Despite this advice, in Linn County many barns continued to have wooden surfaces, although the wood was often whitewashed. Whitewashing provided a surface where dirt

²² During the 1996 survey Only one barn that possibly postdates 1910 was recorded with machine cut nails. The 1912 date of this barn has not been substantiated. At least two barns dating to the first decade of the 20th century had a combination of wire drawn and machine cut nails.

²³ Hopkins, p. 30.

²⁴ Hopkins, p. 31.

could be seen and cleaned.

For the interior woodwork of the cow barn, enamel paint is much the best. White, although it soils quickly is preferable for the simple reason that all dirt may be seen. The old idea of choosing colors not to show the dirt is entirely wrong in principle. In places that must necessarily be kept clean and where it is necessary to know whether or not such places are clean, white paint will always give the desired information in a definite manner.²⁵

During this period, a number of items were developed for the barn which made a farmer's work easier, including the litter carrier patented by William Loudon in 1898, and the feed carrier (Figure 67). It was noted that: "The most satisfactory way to remove the manure is by overhead trolley, and the track should be hung two feet back of the gutter, which brings the carrier in exactly the right position for convenient transfer of the manure from the gutter to the carrier."²⁶ On the exterior of the barn, "The openings through which the manure trolleys pass should never be narrower than 4 ft."²⁷

Farm equipment catalogues during this period advertised a number of products to promote sanitary conditions, including steel stanchions, cow stalls, and gravity water bowls. Steel stanchions with wood linings were also available, supposedly providing more comfort to the cow (Figure 66). Circular Bulletin No. 9, issued by the Oregon Agricultural College Experiment station in 1910, provides details of the iron cow stall and swinging metal stanchions and the Hoard-Schulmerich Stall which was of wood construction.²⁸ The Hoard stall was originated by former Governor Hoard of Wisconsin, who was the editor of Hoard's dairyman. The design in the 1910 circular illustrates the stall with certain changes suggested by a Mr. William Schulmerich and used by him on his farm near Hillsboro, Oregon (Figure 68).²⁹ One example of a barn with stalls similar in design to the Hoard design was located during the 1996 survey (Figure 68). While original stanchions have been removed or replaced in many barns, it appears that simple wood stanchions which could be built by the farmer with little expense were the most common in Linn County except in Grade A dairies where wood eventually did not meet sanitation requirements.

²⁵ Hopkins, p. 71

²⁶ Hopkins, p. 61.

²⁷ Hopkins, p. 62.

²⁸ Kent, F.L., "1. Iron Cow Stall, 2. Hoard Schulmerich Stall," (Corvallis, Oregon: Oregon Agricultural Experiment Station), Department of Dairy Husbandry, Oregon Agricultural College, Circular Bulletin No. 9, March 1910.

²⁹ *Ibid.*

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There was great concern for proper ventilation. One author noted that: "The simplest way...to get air out of the cow barn without opening the doors and windows is to erect a duct which will go from the floor straight up through the roof...There may and should be two outlet ducts when the number of cows require it..."³⁰ "Orange Judd (1911) promoted the very latest ventilation technology, the F.W. King system, which controlled the inflow and outflow of air through ventilating tubes regulated by dampers"³¹ Metal ventilators were located on the roof ridge at the end of a ventilation shaft. While often supplanting wooden ventilation cupolas, the wooden cupola was still being built during this period, sometimes simply for the sake of appearances. Also, for the first time some cupola roofs took the gambrel form.

With the new emphasis on the inclusion of glazed barn windows, also thought to promote livestock health, the hinged window ventilator was advertised in many early 20th century catalogues. These galvanized iron shields prevented air from blowing directly on the stock and prevented rain from blowing in. In Linn County, barns of this period have these shields, but they are almost always made of wood and appear to be hand-made rather than ordered from supply houses. In order to prevent drafts, most barn windows used these shields in conjunction with single hopper windows, often with four or six lights. In some cases, windows from the old farmhouse on the property were recycled for use in the barn. (The earlier windows are identified by their thin muntin profile.) Sometimes, dormers with windows were employed to provide light and ventilation, as well as to improve the appearance of a barn.³²

Roller doors were recommended during this period. "Doors built up out of matched flooring are very strong, and if made double thickness with one thickness running at right angles to the other, will prevent warping..."³³

It was during this period that the material used for fencing also changed. *The Scio Tribune* reported: "The amount of wire fencing which is being used throughout the county is enormous. You will seldom see a new board fence and never a new rail fence, even in the timbered regions. The wire is both better and cheaper."³⁴

³⁰ Hopkins, p. 56.

³¹ Harper, Glenn A. and Steve Gordon, "The Modern Midwestern Barn, 1900-Present", *Barns of the Midwest*, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 230.

³² Vogeler, Ingolf, "Dairying and Dairy Barns in the Northern Midwest," *Barns of the Midwest*, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 105.

³³ Loudon Machinery Company, *Louden Barn Plans*, (Fairfield, Iowa: Loudon Machinery Company), 1914, p. 14.

³⁴ *The Scio Tribune*, Scio, Oregon, May 13, 1915, p. 4.

Table 8. Frame types for barns recorded from the period 1900-1919.

Wall Construction	Number of Barns
Hewn log	1
Hewn timber frame	3
Sawn timber frame	27
Pole frame	4
Platform frame	2
Balloon frame	3
Stud wall construction (system not determined)	2
Plank frame	1
planks and timbers both incorporated for used for posts and/or tie beams	2
Total	45

Table 9. Foundation types for recorded for barns dating to the period 1900-1919.

Foundation Type	Number of Barns
Fieldstone or wood post/drum	12
Concrete pier	8
Concrete perimeter/wood floor	9
Concrete perimeter/slab on grade floor	10
Mortared rubble	1
Altered or original undetermined	5
Total	45

Frame and Truss Innovations

The Plank Frame

"With the scarcity of heavy timber and the consequent cost it is time farmers who are to erect barns should give some study to the newer methods of framing, where no timber is thicker than two inches, and from six to eight inches wide. The use of modern hay and grain elevating machinery calls for barns with open centers. Upper cross-ties, collar-beams, etc., are in the way and are quite unnecessary. The plank frame...is the newest thing in barn framing, and at the same time is very much stronger than the old-fashioned frame made of square timber of eight to twelve inches on a side. It is about half as costly, and a first-class carpenter is not required to erect it. In the plank frame there are no timbers larger than two by eight inches. These are doubled and trebled where great strength is required....In this frame there is no mortise and tenons. The frame is put together with spikes."¹

The precept of plank framing was the substitution of heavy, long, square timbers with plank dimension lumber to form bents. (A plank is defined as a piece of lumber 2" thick.) Where extra strength was required, double and triple members were used. Plank framing was a transitional framing technique which eventually ushered in the development of light framing techniques. The plank frame was also essential to the development of the gambrel-roof barn.²

Plank framing was first publicized widely in the in the 1890s. "Between 1894 and 1903, the *Ohio Farmer* opened its columns to a quartet of vocal plank-frame enthusiasts. Joseph Wing and John L. Shawver became plank framing's most persuasive and prominent advocates."³ Joseph Wing was recognized for his advocacy of a plank frame design known as Wing's Joist-frame while John Shawver was associated with the design known as the Shawver Truss. A number of plan books dating to the early 20th century incorporate Wing's joist-frame and/or the Shawver truss in their barn designs including Farm Buildings (1907), Barn Plans and Outbuildings, Orange Judd Company, (1911), and Radford's Practical Barn Plans (1909).

The adoption of plank framing may have been largely by-passed in Linn County because there was still an abundant timber resource in the early 20th century. Soike notes that "...timber-framed buildings continued to be built well into the twentieth century, especially in forested areas..."⁴ A number of barns located during the 1996 barn survey of Linn County had a timber frame configured in the same manner as Wing's joist frame; timbers, rather than planks,

¹ Orange Judd Company, Barn Plans and Outbuildings, (New York: Orange Judd Company), 1911, p. 9. (Reprint of 1881 and 1903 editions)

² Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in Space, Style, and Structure: Building in Northwest America, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, p. 225.

³ Soike, Lowell J., "Within Reach of All: Midwest Barns Perfected," Barns of the Midwest, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 147.

⁴ *Ibid*, p. 153.

however, were used. Only one example of a barn from this period which had a frame in which the posts were constructed of plank dimension lumber was located. On the other hand, the Shawver truss and braced rafter roof were adopted, and used in conjunction with the timber frame or platform frame in the early part of the 20th century.

Wing's Joist-Frame

Wing's joist-frame was developed in the 1880s and was most popular in the 1890s and first decade of the 20th century (Figure 69, top left). Wing was not the only one to build this type of barn but he popularized it after he built an example in 1893.⁵ Attributes of the Wing design were the use of plank dimension lumber and the open center which did away with cross ties which could prohibit the free movement of modern hay carriers and slings. Wing's Joist-frame:

Took dimension plank lumber and imitated heavy timber framing, carrying the loads through post and beams, but did away with crossbeam ties across the center of the bent. This made each part of the bent act as a cantilever. On each side of the drive floor, a long post reached from the floor straight up to the purlin plate. From this post to the outer wall ran a horizontal tie at the mow floor level, and a diagonal brace went down to the floor sill, both acting as the sinews -- the purlin post in tension and the bracing in compression -- to hold the building from spreading.⁶

The joist-frame barn, in contrast to the Shawver Truss, was typically gable-roofed like the timber frame barns it imitated. Gambrel forms, however, were also built. "By the second decade of the twentieth century, Wing's joist-frame or "open-center" barn...had fallen into disfavor, partly for the greater amount of lumber it required, but mainly owing to the unwelcome diagonal bracing and ties which ran from the wall to the long, vertical, interior purlin posts."⁷ By this time however, Wing was promoting the "new" Wing joist-frame which offered a braced-rafter, self-supporting roof.

The Shawver Truss or Plank Truss

The Shawver Truss, also known as the "plank truss", also opened up the center of the barn, initially by using a truss at each bent (Figure 69, top right). The truss arrangement... "contained a long support post of two members extending from where the mow floor met the sidewall up to the purlin plate. Supporting this double member post was a single-member principal rafter

⁵ Soike, p. 148.

⁶ *Ibid.*

⁷ Soike, p. 155.

that ran from the plate to the ridge."⁸ The trusses in this type of framing are placed 10 to 16 feet apart, with 12 and 14 feet as the usual spacing. Intermediate rafters are supported on the plates and purlins 24 inches on centers. Plans for a Shawver roof truss from the Oregon State College Extension Service are illustrated in Figure 70 and a Schematic plan is illustrated in Figure 71.

Both gable and gambrel roof forms can be accommodated with the Shawver truss although the gambrel form was most common because of the extra hayloft capacity afforded by that roof form. Because of the posts and nailing girts employed in plank frame barns, vertical board siding was typically employed. The Shawver truss was used into the 1930s, well after the period when lighter framing techniques achieved popularity, because of its ability to accommodate barns of wider widths.

Light Frame Construction

The Balloon Frame

Although the balloon frame had been widely used in house construction since the mid 19th century, its acceptance for barn construction, which was so closely tied to the use of heavy timbers, was delayed until the 20th century, eventually superseding plank framing. The balloon frame has continuous studs, spaced 16 to 24 inches on center, from sill to plate. The ceiling joists are fastened to the sides of the studs and given additional support by ribbons (Figure 72).

"Balloon framing superseded plank framing in two respects. Stud walls replaced those of posts and nailing girts for handling loads, and light-truss, self-supported roofs replaced those heretofore supported at the purlin plates with posts from below. For exterior walls, light studs worked with horizontal siding/sheathing to broadly distribute through its framework the stresses from wind pressure, roof load, and weight of the building and its contents."⁹

The balloon frame was used with a variety of roof designs but the most popular was the braced rafter roof.

The Platform Frame

The platform frame (Figure 73) features floor platforms independently framed, with each floor being supported on studs one-story in height. The studs and joists are spaced 16 or 24 inches on centers. The main advantage of the platform frame is that it can support greater floor loads

⁸ Soike, pp. 151-152.

⁹ Soike, p. 156.

than the balloon frame.¹⁰

The Braced Rafter Roof

"In the early 20th century, Joseph Wing introduced the new Wing joist-frame. This design featured a braced-rafter, self-supporting gambrel roof (Figure 69, bottom). This braced-rafter design eventually combined with the balloon frame resulting in a new generation of light-frame barns.¹¹ Self-supporting roofs spread stresses and loads through every set of rafters and eliminated the purlin plate. In a braced-rafter roof:

...each set of four rafters is braced at all angles, to form a light truss, which supports the roof through a length of 2 feet, which is the spacing of the rafters, no purlins or extra framing being necessary. Each truss consists of two lower rafters, two upper rafters, a collar beam, or, tie, and upper and lower braces...The upper braces...extend from the center of the upper rafter to a point about 7 feet below the angle of the roof on the lower rafter. The lower brace...extends from just above the second floor to the point where the upper brace attaches.¹²

In the braced-rafter barn, light rafter units were attached to each stud forming a self-supporting gambrel roof.

"With each angle of the gambrel rafters braced across, tying them together into a unit, and with each braced unit spaced two feet apart rather than resting on a purlin plate supported from below every fourteen feet, several advantages resulted. Each light arch-rib unit could be constructed quickly on the mow floor and raised easily into place. Moreover, the braced-rafter unit required about 11% less lumber, and its materials were of a stock size and a length that could be bought at any lumber yard. Cheap to buy and easily built, braced-rafter construction became the recommended standard for barns up to thirty-six feet in width, while the extremely strong Shawver plank truss was the preferred frame of choice for barns over thirty-six feet and less than forty-two feet wide."¹³

Figure 74 illustrates a cut-away view of a barn with braced rafter framing. A variation of the above described braced rafter framing is illustrated in Figure 75. This design, from the Extension Service at Oregon State College, eliminates the lower braces. The illustrated barn is

¹⁰ Gray, Harold E, Farm Service Buildings, (New York: McGraw-Hill Book Company), 1955. p. 166.

¹¹ Soike, p. 155.

¹² Foster, W.A. and Deane G. Carter, Farm Buildings, (New York: John Wiley and Sons), 1922, p. 79.

¹³ Soike, p. 157.

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above described braced rafter framing is illustrated in Figure 75. This design, from the Extension Service at Oregon State College, eliminates the lower braces. The illustrated barn is a 1½ story barn and the elimination of the brace is probably based on size although this was a common design for larger barns in the county. In yet another variation observed during the 1996 survey, wooden "gussets" are used to stiffen the hip (See Figure 76 below).

Several journals in this period "Became the leaders in the major nineteenth-century innovations in barn building. The Iowa Homestead led in bringing the midwestern hay barn into popularity during the 1880s and 1890s, while the Ohio Farmer, beginning in 1894 and continuing for the next dozen years, popularized plank-frame construction embodied in Joseph Wing's "joist frame" and, more importantly, in the light-timber construction ideas of Ohio builder John Shawver."¹⁴

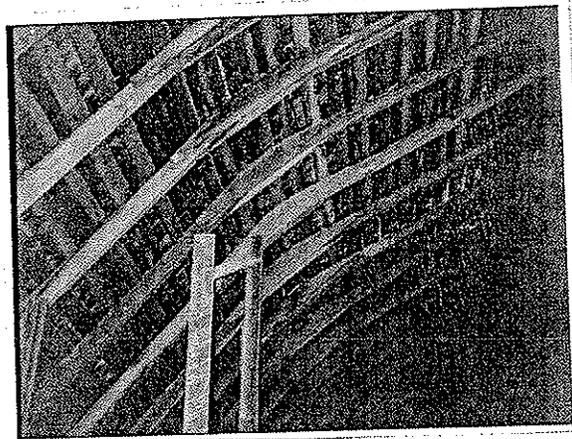


Figure 76. Wood "gussets" stiffen the hip of the Krabill Barn.

¹⁴ Soike, p. 91.

Hay Hoods

With the increased need for hay storage, it appears that unloading hay from a wagon on the exterior of the barn became the preferred method in Linn County sometime around the turn of the century. With exterior unloading, the mow floor could be uninterrupted providing additional mow space. In the alternative barn type, the hay wagon was driven into the barn and unloaded by mechanical fork there requiring the old type of high open central wagon drive.¹ From the drive, hay was unloaded into the mow which extended on either side of the drive.

A hay hood or hay bonnet is often incorporated on barns where the hay is unloaded from the exterior. Francaviglia (1972) identified five hay hood forms.² In form, they range from no hood, to a simple cantilevered pointed hood, to a boxed-in enclosure. Figures 77-82 identifies hay hood forms recorded during the 1996 survey of Linn County barns. By far the most common form in the county is the cantilevered pointed hood. On the other hand, the boxed form is the least common and none of the boxed forms had the decoratively sawn lower edge seen in neighboring Benton County, in the vicinity of Monroe, Oregon, where barn builder E.E. Brimner is associated with barns with boxed enclosures. The gabled form, which occurred in almost equal numbers to the cantilevered pointed hood in the period prior to 1920, appeared to lose favor as the pointed hood dominated in the period after 1920.

Hayhood location was also recorded during the 1996 survey (see Table 10.) On over half of the barns, the hayhood was located on the north elevation. The east elevation was the next favored location. Francaviglia noted that "Loft openings of a disproportionate number of barns in the Willamette Valley face north or east. Farmers have implied deliberate positioning because most rains in this area are accompanied by strong southwesterly winds"³

The various types of hay forks required different sizes of hay doors. The single harpoon fork could be used in a door as small as 5 x 7 feet. A door 8 x 10 was desirable for the double harpoon, while the triple harpoon required a door 9 to 10 feet wide and 10 feet high. A door 9 to 10 feet wide and 10 to 11 feet high was needed with the grapple fork. Hay slings (Figure 83) required a larger door of 10 x 12 feet.⁴ Hay doors could be hinged at the bottom or double-leaf doors could be hinged on the sides. Some hay doors were hung with weights and could

¹ Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in *Space, Style, and Structure: Building in Northwest America*, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, p 220. Philip Dole notes that in operation and in form this barn suggests origins in New England or Pennsylvania.

² Francaviglia, Richard V., "Western American Barns: Architectural Form and Climatic Considerations," *Yearbook of the Association of Pacific Coast Geographers*, Ed. John F. Gaines, (Corvallis, Oregon: Oregon State University Press), Vol. 34, 1972, pp.153-160.

³ *Ibid.*, p. 157.

⁴ Seymour, E.L.D. (ed.), *Farm Knowledge Vol. III: Farm Implements and Construction*, (New York: Doubleday, Page & Company for Sears, Roebuck and Co.), 1919, p. 386.

slide in grooved jambs on the outside of the building.⁵ Single-leaf doors could slide up and down (Figure 84) while double-leaf doors had inclined tracks.⁶

TABLE 10. Hay hood locations on barns recorded during the 1996 linn county barn survey project. (Percentages are based on 459 barns recorded with hay hoods.)

NORTH 54%	EAST 32%	WEST 10%	SOUTH 4%
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⁵ Radford, William A., *Framing*, (Chicago, Illinois: The Radford Architectural Company), 1909, p. 267.

⁶ Radford, pp. 267 and 270.

The Silo

"Architecturally the silo becomes a difficult problem, for while it is certainly typical of the farm, it is a most unmanageable thing for the architect. Perhaps the best way to dispose of the silo is to place it among the trees, where its rigid outlines are softened...."¹

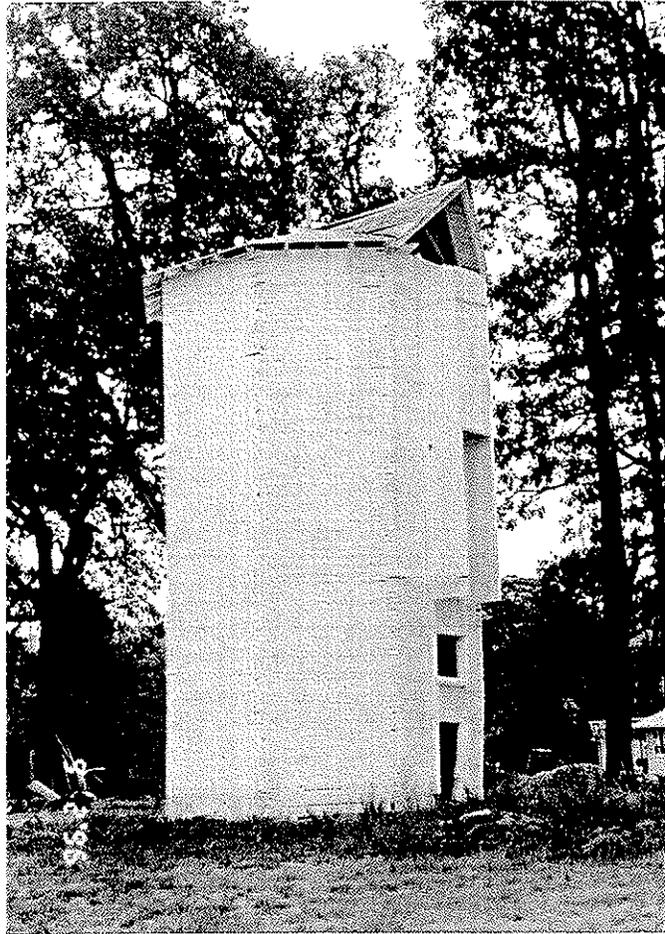


Figure 85. Unique Linn County silo of stacked crib construction. The builder of this silo, located east of Scio, was of Czech descent.

As dairying became a more important part of the farmer's income in Linn County, the silo became an element of the landscape. Silos were critical to successful winter dairying because the cow's milk supply depended upon a secure succulent food source. Cows that were fed silage

¹ Hopkins, Alfred, *Modern Farm Buildings*, (New York: McBride, Nast & Company), 1913, p. 66.

in the winter gave milk year round. "With silage, farmers could keep larger herds of dairy cows during the winter and the cost was lower than with dry feed."²

Nationally, silos were first used in the last quarter of the 19th century. The first silos were simply pits excavated inside the barn. "In 1875, the *American Agriculturalist*...introduced pit silos, trenches into which green crops were pitched, closed off from the air, and stored for fodder."³ Early silos were often built inside of the barn. Later, silos were usually built adjacent to the barn on the gable end or at the end of the "feeding alley".⁴

The earliest examples of upright or tower silos date from the end of the 1880s.⁵ Early silos were rectangular, wood frame towers while the later examples of this type frequently have corners rounded off on the inside with a vertical tongue-in-groove lining.⁶ Although the geographic range of the rectangular wooden silo includes Oregon's Willamette Valley, none have been recorded in Linn County. At least one example of a rectangular wood silo exists nearby, in Lane County.

Circular silos date from the 1890s. An early type of circular silo was the wooden-stave silo constructed of tongue and groove, vertical wooden staves that were held in place by iron bands and turnbuckles. J. Calvin Johnson is credited with introducing the circular stave silo to Oregon in letters published in the *Rural Northwest* in 1892. In 1893, full directions for the construction of such silos was provided. In 1901, J. Withycomb of the Oregon Agricultural Experiment Station penned an article entitled, "The Silo and Silage." In this paper, he noted that "The growing tendency among our agriculturalists to give more attention to dairying, brings frequent appeals for information relative to the construction of the silo..."⁷

In the article, Withycomb recommends that the silo be placed either inside or outside the barn making sure that whatever location is chosen it is convenient for both filling and feeding. If the silo is located on the interior, a partition should be placed between the silo and the cows because objectionable odors can permeate the cows milk. "A good arrangement is to have the silo

² Vogeler, Ingolf, "Dairying and Dairy Barns in the Northern Midwest," *Barns of the Midwest*, Ed. Allen G. Noble and Hubert G.H. Wilhelm (Athens, Ohio: Ohio University Press, 1995), p. 108.

³ Endersby, Elric, Alexander Greenwood and David Larkin. *Barn: The Art of a Working Building* (Boston: Houghton Mifflin Company, 1992), p. 118.

⁴ Noble, Allen G. and Richard K. Cleek, *The Old Barn Book: A Field Guide to North American Barns and Other Farm Structures* (New Brunswick, New Jersey: Rutgers University Press, 1995), p.158.

⁵ Noble and Cleek, p. 158.

⁶ *Ibid.*

⁷ Withycombe, J., "The Silo and Silage," (Corvallis, Oregon: Oregon Agricultural Experiment Station), Bulletin No. 67, June, 1901. p.88

constructed a few feet from the barn. The space between the silo and the barn may be enclosed with a door leading to the barn."⁸ Withycombe advocates the circular form for the silo and notes that the circular stave silo is satisfactory especially if the interior of the silo is plastered with cement.⁹ His recommendation of the stave silo is based on the abundance of wood locally, remarking that "...staves are best made from common fir lumber, free from knots. These can easily be obtained up to twenty-five or even thirty feet in length."¹⁰ A concrete foundation was recommended as the best and perhaps most economical.¹¹ In 1901, concrete was just beginning to be used for building locally.

The wooden-hoop silo is similar to the wooden stave silo except that the hoops are made of wood instead of metal.¹² Noble and Cleek note that early roofs, even on circular silos, were gable roofs. "Roof forms better suited to the circular silo evolved through conical, hipped-conical, low dome, to hemispherical."¹³

Another type of wood silo was the panel silo. The panel silo consists of ribs or uprights set 20 to 24 inches apart. Matched boards are set horizontally between the ribs. Steel hoops are placed around the silo and hold the boards in place. This silo is not round, but is in the form of a many-sided polygon.¹⁴

Concrete stave silos made their appearance in the early 20th century. Foster and Carter note that the first one was built in Michigan in 1904.¹⁵ The concrete-stave silo is similar in construction to the wooden-stave silo, but with concrete staves. This structure was perfected by cement companies around 1906.¹⁶ The poured concrete silo was formed of separately poured, stacked, concrete rings and its inception also dates to the early 20th century.¹⁷

⁸ Withycombe, p. 89.

⁹ *Ibid.*

¹⁰ Withycombe, p. 90.

¹¹ *Ibid.*

¹² Seymour, E.L.D. (ed.), *Farm Knowledge Vol. III: Farm Implements and Construction* (New York: Doubleday, Page & Company for Sears, Roebuck and Co., 1919), p. 457.

¹³ Noble and Cleek, p. 158.

¹⁴ Foster, W.A. and Deane G. Carter, *Farm Buildings*, (New York: John Wiley and Sons, 1922), p. 165.

¹⁵ *Ibid.*, p. 169.

¹⁶ Noble and Cleek, p. 161.

¹⁷ *Ibid.*

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Masonry silos were also constructed beginning in the early 20th century. These silos were often constructed of concrete or tile blocks with brick construction rare.¹⁸

In Linn County, the earliest date for a silo is not known; surviving examples date to the early 20th century. An account is provided of a cooperative project to build silos in the Sodaville neighborhood of Linn County:

In 1916 five Sodaville farmers who ran dairies or did diversified farming joined in a cooperative project of building silos. That spring they put in the fields of corn to provide the ensilage and proceeded with the building of silos...Materials, ready planed and cut to measure, were purchased at the Charlie McPherson sawmill in the Berlin Community. They consisted of 12 uprights for the corners, grooved to take short lengths of tongue - groove-siding. Iron hoops at intervals held the near-circular structure together. The silo proper was then enclosed in a frame shed to protect it from the weather, and roofed. Farmers who filled silos that fall were T.J. Coyle...H. Seifert...George Price...J.S. Campbell...W.H. Skeels. Later J.S. Hazen, Peter Karpinski, Tom Chesire, Leslie Haskin and Homer Brown put up silos. Ensilage cutting time called for a large gang of men. It took three cutters in the field, with long corn knives; two loaders with teams and wagons; a man to feed the corn into the chopper; and three men to tramp the ensilage and pack it after it was blown into the silo. The only piece of machinery that was used in the process was the gas engine that ran the chopper and blower. The high cost of filling and the simple fact that this is not corn country contributed to the final disuse of Sodaville's silos. After their years of service they finally rotted down and disappeared on the landscape.¹⁹

A number of silos types observed during the 1996 survey are illustrated in Figures 86-89.

¹⁸ *Ibid.*

¹⁹ Parrish, Alma H., "Silos Once Dotted Landscape In Sodaville Farming Region," The Lebanon Express, Lebanon, Oregon, Mon. Feb. 17, 1958.

Round and Octagonal Barns

Round and octagonal barns stand as testament to the experimental zeal of this time period. Although examples were built earlier, the round barn received renewed interest in the latter part of the 19th century and early 20th century. "The early round barns typically stood on show-place farms, the farms of wealthy landowners who could afford to indulge their whims in costly architectural experiments. George Washington's sixteen-sided barn is the earliest recorded barn of this type."¹

In the late 19th century, the barn was extolled for its economic advantage -- less perimeter, more enclosed volume, and potential for ingenious and efficient feeding of stock.² Plans for round and octagonal barns could be found in plan books of the period such as William Radford's 1909 Radford's Practical Barn Plans. Barn equipment companies, such as the Loudon Machinery Company, offered a plans for a round barn. The Sears Building catalogue advertised plans and complete barn kits for an octagonal barn in 1917.³ Gordon Van Tine offered pre-cut kits. In 1915, a local newspaper, The Harrisburg Commonwealth, printed two plans for circular barns.⁴

In Linn County, only one example, the octagonal Pugh Barn (Figure 90), still stands, and if there were other examples, they must have been few in number. The Pugh barn does not have a silo in the middle at present but is similar in plan to the octagonal barn illustrated in Radford's 1909 plan book.⁵ The Pugh Barn was reportedly built in ca. 1910.

Soike states that "From the 1880s onward, the [round] barn simply never surmounted resistance to enjoy the kind of undivided support needed for converting most farmers to its use. Enough criticism, faint praise and outright opposition circulated to keep most farmers cautious and uncertain and to confine the round barn's acceptance to a few venturesome souls. It took a stalwart disposition to put up a round barn when all one's neighbors were building rectangular barns."⁶

Writing in 1919, one author concluded that:

¹ Soike, Lowell J., Without Right Angles: The Round Barns of Iowa, Iowa State Historical Department, Office of Historic Preservation, 1983, p. 5.

² Dole, Philip, "Farmhouses and Barns of the Willamette Valley," in Space, Style, and Structure: Building in Northwest America, Ed. Thomas Vaughan and Virginia Guest Ferriday, (Portland, Oregon: Oregon Historical Society), 1974, p. 225.

³ Sculle, Keith A. and H. Wayne Price, "Barns of Nonorthogonal Plan," Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 202.

⁴ Frazer, W.J., "Best Farm Buildings," Harrisburg Commonwealth, Harrisburg, Oregon, Friday, May 21, 1915, p. 3.

⁵ Radford, William, A., Radford's Practical Barn Plans, Chicago, Illinois: The Radford Architectural Co., 1909, pp. 171-172.

⁶ Soike, p. 58.

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The round barn...is not very popular because: (1) It is difficult to light--direct sunlight is secured with difficulty in the interior portions...(2) It is hard to arrange satisfactorily. (3) It is not in keeping with the average farmer's scheme of things: he is in the habit of working on the basis of squares and oblongs and a circular arrangement seems odd and uninviting. (4) The stalls are of an odd and somewhat inconvenient shape. (5) It is difficult to install litter carriers, milking machines and so on because of the circular tracks needed...(6) The centre is usually utilized as a silo; this makes the silage handy, but has the disadvantage of supplying a double set of walls for the silo which is an expensive procedure....(7) It is a difficult shape with which to combine additions and other buildings.⁷

By the mid-1920's, the tide of opinion had moved away from round barn experimentation.⁸

⁷ Seymour, E.L.D. (ed.), Farm Knowledge Vol. III: Farm Implements and Construction, New York: Doubleday, Page & Company for Sears, Roebuck and Co., 1919, p. 414.

⁸ Soike p. 60.

EVALUATION

Property Type: BARNS OF THE EARLY 20TH CENTURY

Property Type Significance: Innovation and experimentation in both agriculture and barn construction are hallmarks of this period. Some barns reflect the transitional quality of the period illustrating evolutionary stages, or sometimes misguided experimentation, in the shift from the timber-framed barns of the 19th century to the light-framed, gambrel-roofed barns of the 20th century. Other barns illustrate conservative or progressive ends of the spectrum. In the early 20th century, diversified farming replaced wheat production; dairying played a prominent role. Barns built during this period generally have more room devoted to dairy cow stanchions and hay storage. The specialized dairy barn also emerges at this time.

Barns dating from the early 20th century illustrate several major themes in Linn County history; areas of significance include agriculture and architecture. **Criterion A** of the National Register may be met by barns which reflect agriculture during this period.¹ **Criterion B** of the National Register may be met by barns that are associated with the lives of persons significant in Linn County history particularly if the individual's contributions were significant within the context of agriculture.² **Criterion C** of the National Register may be met by barns which retain enough characteristics to be considered a representative of the property type.³ In this period, the property type is actually characterized by variation and individuality. A barn may also meet the requirements of Criterion C if it was built by a builder recognized for his consummate skill. "The work of an unidentified craftsman is eligible if it rises above the level of workmanship of the other properties encompassed by the historic context."⁴

Property Type Quantity, Quality and Condition: It is difficult to determine the number of extant barns from the first two decades of the 20th century because only a sample, approximately 45, were recorded; many more were located during the reconnaissance survey but it was generally not possible, upon cursory exterior examination, to distinguish barns of this period from barns of the subsequent period unless a date of construction was provided. Clearly, barns of the 20th century are far more numerous than their 19th century counterparts. Although there are more examples, there is also more variation because of the transitional character of this period. For this reason, while the property type is more numerous, barns significant for illustrating variation or evolution may be poorly represented. For these barns, the integrity thresholds may be less

¹ Criterion A of the National Register states that properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history.

² Criterion B states that properties may be eligible for the National Register if they are associated with the lives of persons significant in our past.

³ Criterion C states that properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

⁴ National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation*, U.S. Department of the Interior, National Park Service, p. 20.

than for barns represented by numerous examples.

Registration Requirements: Linn County barns are National Register eligible under **Criterion A**, in the area of agriculture, if characteristics are present which link the barn to agricultural practices of this period. For instance, dairy barns which date to this period may be eligible under Criterion A because they reflect the importance of dairying at this time. Aspects of integrity which should be present to convey this association are design, especially exterior design, location, and setting. Since barns of this period are more numerous, original cladding materials should be present on at least several elevations. (It is rare to find a Linn County barn in which the siding has not been replaced on the south and west elevations). Modification of door openings, window openings, and window sash should be limited. Metal roofs, while not endorsed, have become almost a universal feature of the Linn County barn, primarily because of the expense of shingle or shake roofs. Ideally, some aspects of the original interior spatial organization should be retained linking the barn to agricultural practices of the period. Silos and milkhouses inside of the barn, or in close proximity to the barn, are good indicators of dairy activity. The barn's location and rural setting should be intact in order to foster the associative qualities.

A barn may be illustrative of a person's important achievements especially if the area of significance for those achievements is agriculture. Of special interest would be barns associated with individuals who made significant contributions to the dairy industry. Barns are eligible for the National Register under **Criterion B** if they are associated with the lives of persons significant in Linn County history, and maintain the characteristics by which that association is conveyed. The most important aspects of integrity for barns eligible under Criterion B are exterior design, sufficiently unaltered so that it would be recognizable by the associated individual, location, and setting. A preliminary list of individuals that may have made significant contributions in the area of agriculture are listed in Appendix C.

Barns of this period may meet the requirements of National Register **Criterion C** if they clearly contain enough characteristics to be considered a representative of this property type. Design, materials and workmanship are more important than location and setting so that moved barns, and barns located in an area where the rural setting has been compromised, may still be eligible. To be considered a good representative of the type, a barn should exhibit the pattern of features common for barns built during this period. Table 4 summarizes these characteristics. Barns of this period are characterized by variation, individuality, and evolution. For this reason, a wide range of design is actually "typical" of the property type. Since one of the most important design aspects of barns is the method of construction, a barn may be significant for framing regardless of other features. In this case, integrity of materials and workmanship are paramount. Barns which fall into the below categories may be eligible under Criterion C if they retain those characteristics by which their significance is understood.

- * Barns which continue the building traditions of the 19th century. For instance, a barn with a hewn timber frame or Gothic cross gable roof.

- * Prototypical barns which are the earliest known examples illustrating 20th century trends in barn building such as: the earliest barns to use concrete for foundations and floors; barns with plank frames; the first barns to use lighter framing methods such as balloon or platform framing; the first barns with gambrel roofs; and early examples of the Shawver truss or braced rafter roof framing.
- * Barns illustrating variation and individuality such as barns with three levels, barns with overhangs, and bank barns.
- * Barns for which the plan can be traced to one of the following: the Regional Plan Service; Oregon State College; pattern books of the period; a barn planning service; catalogue such as Sears or Montgomery Wards; or a barn that is pre-cut and shipped by a company.
- * Round or octagonal barns.
- * Barns which illustrate methods of construction that are rare such as pole frame construction with mortise and tenon joinery or log construction.
- * Specialized barns, such as feeder barns or dairy barns, that illustrate spatial arrangements peculiar to that barn type.

Property Type: SILOS

Property Type Significance: A corollary of dairying, silos began to dot the Linn County landscape during this period. Silos may be eligible under Criterion A of the National Register as a contributing structure when in association with a barn significant for illustrating agricultural practices of the period. A silo may also be significant as a contributing structure under Criterion C for representing a type, period and method of construction. Silos occurring sans barn may also be significant under Criterion C for illustrating a type, period or method of construction.

Property Type Quantity, Quality and Condition: In the early 20th century, the wood stave silo was the standard in Linn County. Presently there are less than ten surviving wood stave silos in Linn County. Of this number several are in poor physical condition.

Registration Requirements: Wood stave silos, because of their rarity, may meet Criterion C, in the area of architecture, even when the barn with which they are associated has disappeared.

HISTORIC OVERVIEW Standardization and Specialization: 1920-1945

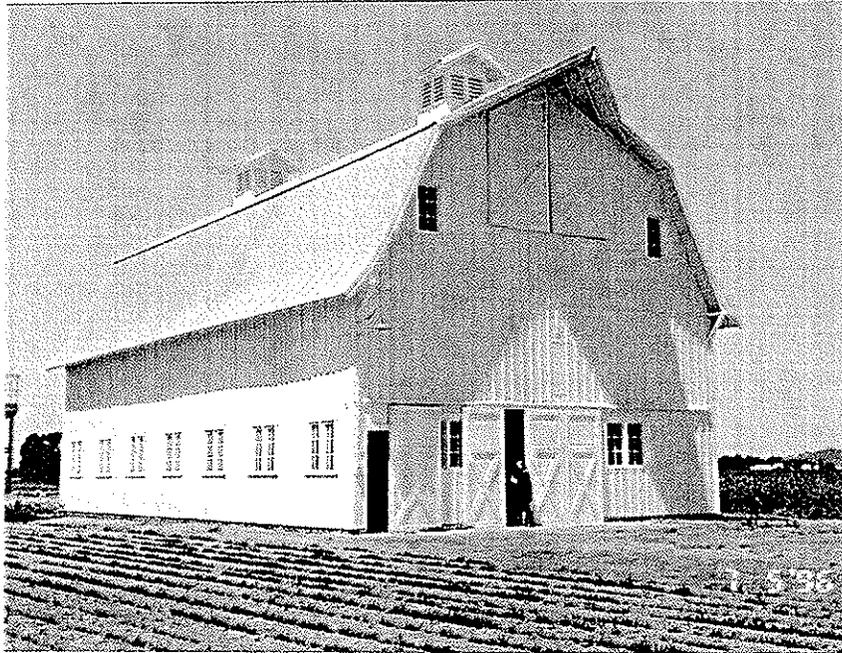


Figure 91. The Cate Barn, built in 1932

Increasing mechanization, especially the widespread adoption of the tractor, more rigorous standards in dairy sanitation, and the introduction of ryegrass as a commercial crop were among the milestones affecting agriculture and barn design during this time period in Linn County.

Increased mechanization, especially after 1920, created new demands for implement storage facilities and altered traditional barn functions. Most farms changed from a dependence on draft animals to mechanical power, and farmers shifted from general-purpose farming to crop and animal specialization, which increased the demand for highly specialized equipment and facilities designed to meet these new production needs.¹

Agriculture was also affected by two major upheavals during this period: the Great

¹ Harper, Glenn A. and Steve Gordon, "The Modern Midwestern Barn, 1900-Present," *Barns of the Midwest*, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, pp. 224-225.

Depression and the Second World War.

By 1921, feverish wartime purchasing had ended; crop prices plummeted, with American farm income sliding to half the level of the previous year.² In the period from 1920 to 1930, the number of farms in Linn County increased only slightly, from 3,041 to 3,074. In the 1930s the country plunged into the Great Depression. Overextended farmers were faced with foreclosure. The policies of the New Deal had a profound affect on agriculture. The New Deals's Agricultural Adjustment Acts (1933-1938) paid farmers to curtail production in order to reduce surpluses and thus raise prices. The Farm Credit Administration (FCA), established in 1933, provided short and long term credit to farmers that could be used, among other purposes, to acquire the necessary machinery. During the Depression, "...financial institutions and insurance companies found themselves in possession of even more land after many farmers...were forced to default on their mortgages...Equitable Life Assurance Society seized thousands of acres ...farming while it awaited an upturn in real estate prices."³ A barn located on Knox Butte Road in Linn County (Figure 110) was built by an insurance company in the 1930s with the goal of improving the property for later sale. At the same time, there was a substantial increase in the number of farms in Linn County during the early 1930s: The number of farms grew from 3,074 to 3,849 in the five-year period, 1930-1935.⁴ This increase in farms reflects a regional surge in population due, in part, to the exodus of framers from the dust bowl. The early 1940s once again saw great demand for agricultural products as the Second World War raged.

Just as experimentation was a hallmark of early 20th century agriculture and barn construction, the desideratum of this period was to be modern. "The agricultural press, land grant colleges, and farming societies all urged the farmer to be 'modern'".⁵ Being modern meant adopting labor-saving equipment. And for many, being modern meant owning a tractor. "In one generation between 1920 and 1950, most farms in the United States changed from dependence on draft animals to dependence on mechanical power."⁶ "Gasoline tractors were not common until the early 1920s, and were at first used largely for plowing and other heavy tillage operations."⁷ In 1924, the Harrisburg newspaper,

² Williams, Robert C., *Fordson, Farmall, and Poppin' Johnny: A History of the Farm Tractor and Its Impact on America*, (Urbana and Chicago: University of Illinois Press), 1987, p. 71.

³ Williams, p. 163.

⁴ U.S. Agricultural Census

⁵ Williams, p. .

⁶ *Ibid*, p. 3

⁷ Cavert, William L., "The Technological Revolution in Agriculture, 1910-1955," *Agricultural History*, 30(1), 1956, p. 18.

The Disseminator, ran an article entitled, "Tractors Useful on Wheat Farms".⁸ That same year, the row-crop tractor was introduced. "The introduction of a successful general-purpose tractor marked the end of an era."⁹ By the thirties, farm specialization and farm tractor numbers were both growing. The tractor discouraged diversification because "The more diversified a farm was, the more specialized equipment it required..."¹⁰

The introduction of the tractor foreshadowed the end of the self-reliant family farm. "The tractor forced the farmer to rely on fuel, a commodity which was beyond the farmer's control, making him dependent upon others."¹¹ Farmers often had to borrow money to purchase the mechanized equipment needed to remain competitive in the face of the ever increasing yields that resulted from mechanization. The "...farmer knew that mechanization led to overproduction, but that farmers had to produce more in order to meet their payments on their equipment. And machinery was essential in order to remain sufficiently competitive to continue farming."¹² Surpluses have plagued farmers ever since 1921.¹³

Before farmers brought tractors, they had to use about one-quarter of their land to feed their horses or mules...Fully one-half of the increase in farm produce for human consumption between the world wars came from acres that had formerly fed horses. In 1941 estimates of "released" land came to thirty-five million acres that had shifted into market production between 1918 and 1945...In addition, there was a marked decrease in the demand for oats and hay.¹⁴

In Linn County, oat production dropped markedly in the 1920s, from 49,735 acres in 1920 to 34,546 acres in 1930.¹⁵

⁸ "Tractors useful on wheat farms," The Disseminator, Harrisburg, Oregon, May 22, 1924.

⁹ Williams, p. 79.

¹⁰ *Ibid*, p. 138.

¹¹ *Ibid*, p. 139.

¹² *Ibid*, p. 153.

¹³ *Ibid*, p. 149.

¹⁴ *Ibid*, 149-150.

¹⁵ Hill, D.D. Oats Production in Western Oregon. (Corvallis, Oregon: (Oregon State Agricultural College, Agricultural Experiment Station), Station Bulletin 285, June 1931, p. 5.

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Mechanization also increased farm size.¹⁶ "The pressure to constantly expand forced large farmers to swallow up their smaller neighbors. Ever-larger tractors demanded ever-larger farms if they were to be operated efficiently."¹⁷ Mechanized farming also increased the amount of capital required to begin farming.¹⁸

While the first practical and affordable gasoline tractors were available in the 1920s, many Linn County farmers reported that they used horses for farming until the 1940s. Merle Jesse Splawn, who grew up on a farm in the Calapooia River Valley, recalled: "We got our tractor in the early forties. Up until that time we had horses. Horses really were best for muddy conditions on a farm. They could get in the fields when it would be too muddy for a tractor. We kept one of our horses through to about 1950."¹⁹

Dairying became a more specialized activity, with dairying ranking as the state's biggest income-producer (16% of the state's gross agricultural income in 1935).²⁰ Milk production ranked first in the products of the county in 1944.²¹ While a small herd of dairy cows was a component of the diversified farm in the early 20th century, during this period the specialized dairy emerged. In 1928, one observer noted:

With the increased competitive conditions it is becoming more doubtful if the small-issue dairy farm can be successful, or a paying proposition. This is more of an age of specialization, and in order to take advantage of the latest inventions in labor-saving machinery, the herd unit must be of sufficient size to get the highest possible returns from its use...It begins to appear that the dairy unit should either be of a size sufficient to supply the home need, or else considerably larger; for instance, from 20 cows up. Probably the six- and seven-cow units are uneconomical and even the ten- and twelve-cow units are becoming questionable.²²

¹⁶ Williams, p. 149.

¹⁷ Williams, p. 163.

¹⁸ Williams, p. 161.

¹⁹ Judge, Barbara C., Historic Farm Structures as Material Culture: an Oregon Study, (Corvallis, Oregon: Oregon State University), Master's Thesis, 1993, p. 66.

²⁰ Scudder, H.D., and E.B. Hurd, "Graphic Summary of Agriculture and Land Use in Oregon," (Corvallis, Oregon: Agricultural Experiment Station), Station Circular #114, December 1935, p. 26.

²¹ Federal Cooperative Extension Service, Oregon's Farm Products for Market 1936-1940, (Corvallis, Oregon: Oregon State College Extension Service), Extension Bulletin 641, Sept. 1944.

²² Jamison, N.C., "Dairy Cattle Feeding With Some Pointers on Management," (Corvallis, Oregon: Oregon Agricultural College Extension Service), Extension Bulletin 402, March 1928, p.13.

Table 5a lists some of the Linn County farmers with larger herds of dairy cows.

One of the labor-saving machines was the milking machine, which, prior to the availability of electrical power, could be operated with a small, portable combustion engine. In 1928, it was noted that, "With increased cost of labor and the difficulty of getting the proper kind of milkers, the milking machine is coming into greater general use."²³

"By 1923, Linn County had more dairy cows than any other county in the state."²⁴ The Jersey breed was the most important in Linn County during this period and the breed was known for its cream production. In 1928, ninety percent of all the dairy cattle in Linn County were of that breed, with 227 breeders of registered Jersey cattle in the county.²⁵ "Linn County Jerseys are shipped to every state in the union, and to give some idea of the magnitude of this industry this county last year ranked third in the United States in the number of transfers of ownership of registered Jerseys, also fifth county in the United States in registration for 1927."²⁶

During the past fifteen years Linn County herds have claimed continuously one or more of the eight world records for production. This county can also claim the distinction of having for four successive years the highest producing herd in America. Linn County produced the first medal of merit bull in the world; also the world record fourteen year old cow, four year old cow and senior yearling.²⁷

The Medal of Merit Jersey, one of only two in the country at that time, was Holger, owned by the Riverwood Dairy operated by Hector Macpherson.

Other breeds found on county dairy farms included Holsteins, Guernseys, and Brown Swiss.²⁸ The Dairy Herd Improvement Association was formed in Linn County in 1929. "The dairy herd improvement association with its records of production and feed costs puts dairying on a really business basis according to more than 500 Oregon

²³ Jamison, N.C., "Dairy Cattle Feeding With Some Pointers on Management," (Corvallis, Oregon: Oregon Agricultural College Extension Service), Extension Bulletin 402, March 1928, p. 13.

²⁴ Mullen, Floyd C., The Land of Linn, (Lebanon, Oregon: Dalton's Printing), 1971, p. 197.

²⁵ Anon, 1928, n.p.

²⁶ *Ibid.*

²⁷ Anon, 1928, n.p.

²⁸ Anon, 1928.

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dairymen who belong to these associations."²⁹

According to a promotional brochure dating to 1928:

Markets for dairy products are stable and well established with progressive creameries and cream buying stations located conveniently throughout the county, and a large milk condensery at Albany, the County seat. Both the condensery and the creameries have truck lines extending into all the out-lying districts, thus providing a convenient medium of transportation of these products to market.³⁰

Hauling was facilitated by motorized vehicles operating on an all weather road network and supplanting horse drawn conveyances. Outlets for cream, which were numerous, included the Albany milk condensery which was purchased by the Borden Milk Company in 1929.³¹ That same year, the Albany Creamery Association, a Farmers' Co-operative Creamery, was producing Linn Butter.³² The Albany Creamery Association incorporated in 1945. The Albany Dairy Cooperative incorporated in 1932, and the Snow Peak Dairy in Albany incorporated in 1933.³³ In Harrisburg, in the early 1920s, farmers affiliated with the Cooperative Dairyman's League. In 1931, the Brownsville Creamery shipped butter to Seattle and Tacoma and to other points in Oregon and Washington. In Scio, the milk condensery was operated by the Oregon Milk Co. of Portland.³⁴

Dairies were often located near cities. "At one time there were 19 dairies around Albany, all of them delivering door to door."³⁵ The Nygren Bros. Dairy, at its peak in the 1930s and 1940s, "...milked 100 cows a day and had its own retail milk-selling business. The retail end was phased out after World War II, and the dairy eventually sold its milk exclusively through Mayflower, a dairy cooperative in Salem..."³⁶ Prairie Rose Dairy near Shedd, operated by the Davis Family, had its own bottling plant and milk delivery trucks.

²⁹ The Brownsville Times, Brownsville, Oregon, July 25, 1929.

³⁰ Anon, n.p.

³¹ The Brownsville Times, Brownsville, Oregon, May 30, 1929.

³² The Brownsville Times, Brownsville, Oregon, June 6, 1929, p. 3.

³³ Linn County Articles of Incorporation.

³⁴ Bates, Carol. Scio in the Forks of the Santiam. Gates, Oregon: Susan Gauderman, Gates Graphics, 1989, p. 209.

³⁵ "Nygren dairy", Albany Democrat Herald, Albany, Oregon, Friday, March 26, 1993, p. 46.

³⁶ *Ibid.*

In the 1920s, grass seed was grown commercially for the first time in Linn County. Howard Jenks, who lived near Tangent, became the first commercial shipper of domestic ryegrass.³⁷ This firm opened the eastern market for ryegrass. In 1924, The Harrisburg Bulletin reported that:

"When harvest time rolls round it will be off to the rye fields this year around Harrisburg. Last fall dozens of farmers who feared a slump in the hay market, turned their attention to the production of rye seed and hundred [sic] of acres were put in last fall, some of the farmers planting as much as 250 acres. There is a promise of a good price for the seed which it is said will be shipped to the Atlantic Coast states. There is also a promise of a good crop, especially where the Italian rye seed was sown."³⁸

The Brownsville Times on July 1, 1926, reported that, "...ryegrass has become quite an extensive production in this section of the Willamette Valley and brings growers many thousands of dollars."³⁹

In 1935, it was stated that, "Grass seed growing is in its infancy in Oregon. Linn County, uses the largest acreage chiefly of domestic ryegrass."⁴⁰ Figure 92 illustrates the amount of ryegrass grown in Linn County in comparison with other areas of the state. Locally, the region with the most intensive ryegrass production was the floor of the Willamette Valley, south of Albany. Between 1936 and 1940, production doubled.⁴¹ By the 1940s, large acreages, that had been devoted to wheat production in the 19th century now were planted in grass seed. As a result, the Willamette Valley became recognized as the primary source of ryegrass seed in the United States. Ryegrass production brought about the conversion of many barns into seed cleaners, with added elevating equipment and large bins. Combines were required to thresh ryegrass. Self-

³⁷ Mullen, p. 158.

³⁸ "Many Acres of Rye in This Neighborhood," The Harrisburg Bulletin, Harrisburg, Oregon, May 1, 1924, p. 1.

³⁹ The Brownsville Times, Brownsville, Oregon, July 1, 1926.

⁴⁰ Scudder and Hurd, p. 26.

⁴¹ Breithaupt, L. R., and M.D. Thomas, and C.J. Borum, "Production and Income Statistics for Certain Specialty Farm Products Oregon 1936", (Corvallis, Oregon: Oregon Agricultural College Extension Service), Extension Circular No. 318, Sept. 1936.

Thomas M.D., and Breithaupt, L. R. and N. I. Nielsen, "Production and Income Statistics for Specialty Farm Products Oregon 1938", (Corvallis, Oregon: Oregon Agricultural College Extension Service), Extension Circular No. 334, July 1939.

Thomas M.D., and Breithaupt, L. R. and N. I. Nielsen, "Production and Income Statistics for Specialty Farm Products Oregon 1940", (Corvallis, Oregon: Oregon Agricultural College Extension Service), Extension Circular No. 375, August 1941.

propelled combines were not introduced until the 1940s. Prior to that time, the combine had to be pulled by a team of horses or a tractor.⁴²

While ryegrass began to dominate on the valley floor, farmers were still producing the hay crops required by the county's large number of dairy herds. In 1928, one source noted that, "The principal hay crops grown are red and alsike clover, cheat and vetch."⁴³

Although hay baling equipment had been available since the 19th century (in the mid-1880s, steam powered balers replaced the horse-powered hay press of the 1850s), hay was frequently put in a barn in loose form in the early 20th century as feed for a farmer's livestock. Hay baling became more common during this period and may be related to the increasing sale of hay; hay bales, as opposed to loose hay, could be easily transported. Figure 93 illustrates a baling operation on the Roscoe B. Paine farm in the 1930s. Farmers who were not specializing in dairying and who had converted to tractor power no longer need a large mow of loose hay.

Flax was also grown in Linn County during this period. "In 1924, Oregon contained 5000 of the 6500 acres of flax produced in the U.S. and there is no better flax land than some in Linn County."⁴⁴ The demand for flax accelerated during World War II when a farmers cooperative flax processing plant was built in Harrisburg in 1941. The plant burned down the following year.⁴⁵ In 1939, Linn County also led the state in turkey production.⁴⁶ Often pigs were kept by dairy farmers because for was recommended that one pig be kept for every dairy cow on farms that sold cream. (Pigs were fed the extra skim milk.) In 1944, the top agricultural products of Linn County were milk production, turkeys, and common ryegrass seed. These were followed by: cattle and calves; chicken eggs; hogs; sheep; lambs and wool; wheat; oats; farm forest products; and hairy vetch.⁴⁷

The first known rural electric line in the country was reportedly constructed in 1906 at

⁴² "Barrett Bros.," Albany Democrat Herald, Albany, Oregon, Friday, March 26, 1993, p. 38.

⁴³ Anon, 1928, n.p.

⁴⁴ Rural Enterprise, Halsey, Oregon, July 22, 1925, p. 4.

⁴⁵ Mullen, p. ____.

⁴⁶ Thomas, M.D., and L.R. Breithaupt, and N. I. Nielsen, "Production and Income Statistics for Specialty Farm Products Oregon 1938", (Corvallis, Oregon: Oregon Agricultural College Extension Service), Extension Circular No. 334, July 1939.

⁴⁷ Federal Cooperative Extension Service, Oregon's Farm Products for Market 1936-1940, (Corvallis, Oregon: Oregon State College Extension Service), Extension Bulletin 641, Sept. 1944.

Hood River, Oregon.⁴⁸ Mountain States power reportedly provided electricity in the Jefferson-Scio Road area as early as 1925-26. It was not until the mid-1930s, however, that electrical power first reached many farmers in Linn County. "Following the advent of the Rural Electrification Administration in 1935, there was a rapid increase in the availability of electricity, and in 1940 the census reported that 45.6 per cent of all farms had an electric distribution line within one-fourth mile of the dwelling."⁴⁹ Merle Jesse Splawn, living in the Calapooia River Valley, recalled that, "We got electricity in 1945. The barn had electricity before we had it in the house."⁵⁰ With electrical power:

The farmer soon discovered that it was feasible to have small, medium, and large motors scattered about the farmsteads as might be needed. Thus, we have electric pumps, milking machines, ventilating systems, hay and grain dryers, barn cleaners, silage unloaders, feed grinders, tool grinders, and milk coolers, and lights when and where we want them. We also have heat lamps to warm the new born pigs and lambs and thermostatically controlled hovers for chicks and turkey poults.⁵¹

⁴⁸ Cavert, p. 20.

⁴⁹ *Ibid*, p. 20.

⁵⁰ Judge, p. 78.

⁵¹ Cavert, p. 20.

Table ____. List of some Linn County dairies and farmers who owned large dairy herds.

Leo Cersovski (Guernseys), Harrisburg area, sold to the Eugene Farmer's Creamery
E.E. Gourley and Sons Dairy, Knox Butte area
Shelby Dairy, Knox Butte area
J.M. Dickson, Ashburn Farm, Shedd
Walter Davis, Prairie Rose Dairy, Shedd
Lone Oak Dairy, Tangent
Schumaker Holsteins, Cottonwoods area
Jack Pugh, Shedd
Everett Struckmeier (Jerseys), Scio
Svede Oling, Albany
Rollo Hulbert, Albany
Nygren Bros. near Albany (Old Salem Rd.)
Hector McPherson, Tangent area, Riverwood Dairy
F.J. Wrightman, Mistletoe Dairy
Minor T. Clark Dairy
Meadow Lane Dairy
Totem Pole Dairy
Petersen Dairy
Wayside Dairy
Flanagan Dairy, Scio
Snow Peak Dairy
Roscoe Paine, Peoria Rd.
Lee Foster, between Harrisburg and Halsey
Floyd and Gene Fisher, Brownsville area
Phil Haddan Jerseys (Riverside Dr.)
Bill and Vivian Freekeson, Albany vicinity
Walter Hense, Shedd area
Earl Shearer, Shedd area
Warren Cooley, Albany
W.W. and Mary Poland, Shedd
Jay Palmer, Albany
G.A. Overton, Brownsville
Alva Byers, Cottonwoods area
Bob Burkhart, Cottonwoods area

IDENTIFICATION BARNs OF THE MID-20TH CENTURY

PROPERTY TYPE DESCRIPTION

Design, Materials, and Workmanship

A trend toward barn specialization and single-story construction began in the 1930's and accelerated after World War II. Government and university agricultural experts alike confidently predicted that the general-purpose wood-frame barn, nostalgically, and at times, sarcastically, referred to as "the big red barn", would be replaced by five million gleaming buildings made of steel, aluminum, and treated wood.¹

The trend toward specialization saw dairy farmers building dairy barns, or, in the later part of this period, a separate hay barn, loafing shed and milking parlor combination. Grass seed farmers needed seed cleaners and warehouses. The tractor and its accessories required machine sheds. Out of the transitional years of the early 20th century emerged similitude, characterized by light frame construction and the gambrel roof form. Farmers began to rely less on traditional barns built by carpenters and more on engineer-prepared plans. This standardization was engendered by the increasing dissemination of barn plans by a number of agents. In 1922, the authors of a book on farm building construction remarked:

The services of the architect and engineer are needed on the farm. In the past the field of the farming community has not attracted the architect, partly because the work of the city kept him busy, and partly because the farmer has not realized the need for specialized personal service. Much credit for the development of farm buildings is due to the professional services rendered through the State experiment stations, agricultural colleges, trade associations, and manufacturers. These agencies have been instrumental in providing good plans, pointing out economies of construction, and proving the need of modern farm equipment.²

One of these agents was the Regional Plan Service which was developed through the cooperation of a number of federal and state agencies, including the USDA, the state extension services, and, in some states, including Oregon, the Agricultural Engineering Departments of the state colleges. The purposes of the plan service of each region of the United States -- northeastern, north central, western, and southern -- was to standardize farm building construction for a given geographical area, and disseminate plans and information on

¹ Harper, Glenn A. and Steve Gordon, "The Modern Midwestern Barn, 1900-Present," *Barns of the Midwest*, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 224.

² Foster, W.A., and Deane G. Carter, *Farm Buildings*, (New York: John Wiley and Sons), 1922, p. 4.

farm building construction.³ "Thus a farmer who wants a plan for a particular farm building can consult the catalogue in his county agent's office, and through the County Agent, order the standard plan from the state extension service."⁴ Oregon State College had a Farm Plan Building Service. Available plans were listed in an Extension Circular. The plans appear to have been prepared by the Oregon State College Department of Agricultural Engineering, in cooperation with the U.S. Department of Agriculture. A list of plans available in September 1941 included general purpose barns, dairy barns, horse barns, beef barns, and bull barns. Plans were also available for wood and steel stanchion details, roof details for the Iowa truss and the Shawver truss, and Gothic rafter details for the bent and sawed type.⁵ Unfortunately, many of the plans listed are not in the current collections of the Oregon State University (formerly Oregon State College) archives.

A number of barn equipment companies offered plan services during this period, including the Loudon Company which had a representative in Portland, Oregon. Loudon's plan service:

...helped gain entry for the firm to advise farmers, especially dairymen, on ways to modernize and equip the barn with Loudon's main stock-in-trade, which included ventilation systems, hay and litter carriers, windows, stalls, and pens....By 1940, the company claimed it possessed "easily the largest" barn-plan department from which "more than 25,000 barns have been planned the world over."⁶

The Star Line catalogue of 1921, published by the Hunt, Helm, Ferris & Co. of Harvard, Illinois, advertised The Star Barn Plan Service.⁷ The company also had a main office located in Portland, Oregon. Like the Loudon Company, the catalogue advertised steel stalls, steel stanchions with wood linings, tubular steel stanchions, adjustable wood stanchions, steel manger partitions, water bowls, steel bull pens, window guards, and "steel cupolas". Other companies which sold barn accoutrements as well as barn plans were the Hudson Manufacturing Co. of Minneapolis, Minnesota, and the James Manufacturing Co. of Fort Atkinson, Wisconsin.

During this period, concrete perimeter foundations and slab-on-grade floors became the

³ Gray, Harold E., Farm Service Buildings, (New York: McGraw-Hill Book Company), 1955, p. 29.

⁴ *Ibid*, p. 30.

⁵ Oregon State College Department of Agricultural Engineering, "Oregon State College Farm Building Plan Service." (Corvallis, Oregon: Oregon State College Extension Service), Extension Circular No. 376, September 1941.

⁶ Soike, Lowell J., "Within Reach of All: Midwest Barns Perfected," Barns of the Midwest, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 159.

⁷ Hunt, Helm, Ferris & Co., The Star Line, (Harvard, Illinois: Hunt, Helm, Ferris, & Co.), 1921 edition.

standard in barn construction. It was recommended that, "The barn foundation should be continuous, rather than in the form of piers."⁸ Of the forty-two barns recorded from this period during the 1996 survey, all but two feeder barns had concrete foundations, albeit several had concrete piers instead of perimeter foundations.

Two other roof systems emerged during this period: the Clyde Truss, developed in the early 1920s for a gambrel roof, and the round-arched Gothic roof, developed in the previous period but appearing locally in the 1920s. These are discussed in more detail in the following section entitled, "Truss Innovations".

Balloon frame construction, with either a braced rafter roof or, less commonly, a Shawver truss, was the norm. As in the previous period, girders supported by posts helped carry the vertical load of the loft. Metal posts were recorded in several barns dating to this period, with one barn having posts from the Loudon Company. The beams were almost always built-up by this time. Loft floors were often of double thickness; heavy paper was placed between the layers to keep the dust from sifting through.

Timber frame barns were still being built during this period, but they represented a minority of the barn construction that was taking place. Figure 94 illustrates some bent configurations for timber frame barns of this period. The gambrel roof form was also standard although gable roofs were generally found on the timber frame barns from this period. During the 1996 survey, all barns with a balloon frame had a gambrel roof although the corollary was not always true since there were several barns with timber frames that had light-framed gambrel-roofs. At least one family during the Great Depression utilized materials on hand to build a log barn (Figure 95).

Masonry construction is first seen in barns constructed during this period, but appears to have been rare in this area probably because wood was copious. During the 1996 survey, only two barns with masonry wall construction were recorded in the county: one was built of hollow tile; the other was constructed of pumice block. Both barns dated to the 1940s. The literature notes that steel frameworks were being used to some extent in barns at this time. The *Agricultural Engineering Journal* of May 1926, contains a report of a steel frame barn that was found to be very satisfactory.⁹ In 1936, the James Manufacturing Company was furnishing steel frames.¹⁰ Galvanized sheet metal was also used as sheathing as early as the 1930s.¹¹ Only one metal building was recorded during the 1996 survey -- the Prairie Rose

⁸ Foster, W.A. and Deane G. Carter, *Farm Buildings*, (New York: John Wiley and Sons), 1922, p. 67.

⁹ Wooley, J.C., *Farm Buildings*, (Columbia, Missouri: The University Co-Operative Store), 1936, p. 59.

¹⁰ *Ibid.*

¹¹ *Ibid.*

Dairy milking parlor manufactured by the James Manufacturing Co. just prior the onset of World War II. (The owner, Mr. Davis of Shedd, indicated that it was the last one sold by the company until the end of the war.) If other metal building from this period exist, they were missed in the course of the survey. A large gambrel-roofed pole barn appears to have been originally clad with metal sheathing; however, the date of the barn, which is in very poor physical condition, has not been determined (Figure 96).

The use of poles for a barn of this size was unexpected since pole barns generally are smaller. Pole barns were constructed during this period and Luther R. Shanks has described a pole barn built on his property in the Tennessee area of Linn County in 1941 or 1942. He recalled:

I had an opportunity to get some poles over at Providence for construction of a barn. I hauled these poles over here and peeled out enough for all the frame work, I hewed the timbers for the foundation for a hay area 36 x 24 ft. and put a lean-to twelve ft. on both sides so actually we had an area thirty-six by forty-eight. We used peeled poles for rafters so all I bought one by twelve boards nailed them vertical and put bats on the cracks, painted it red so it looked good with the board (shake) roof.¹²

With the predominance of the balloon frame, horizontal siding is more common than vertical siding during this period. In Linn County, drop siding appears to be used most commonly, although a narrow bevel lap siding and v-match were also used. Barns that had vertical siding were timber or plank frame barns (posts composed of plank dimension lumber). Most vertical-sided barns from this period incorporated battens.

It was advised that:

For good appearance, the tops of all doors and windows in the first story should be placed on the level. Large windows, possibly in groups of two or three, are better than small single windows. Dormer windows often serve to break up large space of roof, and they light the loft as well. The roof should be in the proper shape and proportions....The projection of the eaves, or the "overhang," should be in proportion to the size of the building. There are several building materials which might be combined to enhance the appearance of the barn. Shingles, stucco, and lap siding, while not generally used as a barn covering, might well be used to advantage in many cases.¹³

The hopper windows observed on many of the early 20th century barns continued to be used

¹² Shanks, Luther R., "I'll be Jumped Up", unpublished manuscript, ca. 1982.

¹³ Foster and Carter, p. 50.

during this period (Figure 97). A plan from the Oregon State College Department of Agricultural Engineering for a 34 foot milking barn, illustrates the details of a window of this type, referring to stock 1'-10" x 3'-5" barn sash (Figure 98).

Hayforks now could be pulled by horse, automobile, or by electricity. In 1929, a good power hoist could be procured for \$80.00 to \$100.00.¹⁴ A power hoist was observed on one Linn County barn but may have been overlooked on other barns.

Older barns continued to be remodeled. "An essentially modern barn could be created by rebuilding or remodeling an older structure. Remodeling involved constructing a self-supporting roof over the lower portion of the earlier timber-frame bents."¹⁵ Materials could also be recycled from older barns and other buildings for new barn construction. Luther Shanks recalled that "...Granddad heard of an old church building in Talman [Tallman] that was for sale, so he ended up buying this building intending to dismantle it and use it in his barn."¹⁶ Several barns dating to this period incorporated posts from earlier barns.

With the advent of grass seed production on a large scale, some farmers converted their barns into seed-cleaning facilities. Commercial seed cleaners had bins 2-3 stories high to hold seed that was to be cleaned.

Spatial Arrangement

Several agricultural developments affected the design of the general purpose barn during this period. In some cases, horse stalls disappeared or were reduced in number, especially toward the end of this period. Notwithstanding the shift from the horse to the tractor, some general purpose barns built in this period had horse stalls, for many Linn County farmers farmed by horse until the end of World War II (Figure 99). Even those farmers who purchased a tractor often kept a horse or two. The author of a book published in Portland, Oregon in 1947, remarked that, "Tractor equipment is fast replacing horse-drawn tools. In addition to tractors, we now have combines, corn pickers, forage harvesters, one-man balers, four-row planters, grain and fertilizer drills, power sprayers and dusters, potato diggers and other mechanized equipment.... Thus, machine sheds are needed for modern farming..."¹⁷ A number of barns from this period had areas for tractor storage, even though tractors were

¹⁴ Price, F.E., A.W. Oliver, and E.L. Potter, "Electric Hay Hoists," (Corvallis, Oregon: Oregon State College), Agricultural Experiment Station), Station Bulletin 255, Sept. 1929.

¹⁵ Harper, Glenn A. and Steve Gordon, "The Modern Midwestern Barn, 1900-Present," *Barns of the Midwest*, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 218.

¹⁶ Shanks, p. 79.

¹⁷ Doane Agricultural Service. *The Farm Book: A Guide to Better Farming with Better Buildings*. West Coast Woods, Portland, Oregon, 1947, p. 22.

generally not stored in the barn because of the fire hazard. Machine sheds were also added to some barns (Figure 100).

The wagon drive was eliminated in some barns, and was replaced by a narrower feed aisle (Figures 101 and 102). A shift from loose to baled or chopped hay at this time reduced the need for haymows. Many farmers adopted the "loose-housing" or "loafing" system for housing cattle.¹⁸ In Linn County, loafing areas began to be included within the envelope of the barn (Figures 101 and 103), or in lean-tos (Figure 102). The cows were only brought into the barn to milk.

Longitudinal arrangements of consisting of three aisles with horses, cows, and grain bins flanking a wagon drive continued to be built during this period (Figure 104). Barns with this three-aisle plan were most commonly from 34 to 40 feet in width. The length dimension varied greatly from 40 feet to 110 feet, with the length dimension generally over 60 feet. A longitudinal arrangement of three-aisles appears to have been favored, especially for dairy barns (Figure 105).

A transverse plan recorded in both late 19th and early 20th century barns in the county continued to be used during this period. The transverse plan has a wagon drive in an interior bay; the bay is flanked by grain bins. Outer bays were used for horse stalls and cow stanchions (Figures 107 and 108). Barns having this plan generally measure 40 x 60 feet. Figures 109 and 110 illustrate two other arrangements recorded during the survey for barns dating to this period.

Six bank barns built between 1920 and 1945 were recorded. Four of the six bank barns had a milking parlor in the lower level. Feeder barns also continued to be built during this period.

¹⁸ Harper, Glenn A. and Steve Gordon, "The Modern Midwestern Barn, 1900-Present," *Barns of the Midwest*, Ed. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 225.

Truss Innovations

The Arched Roof

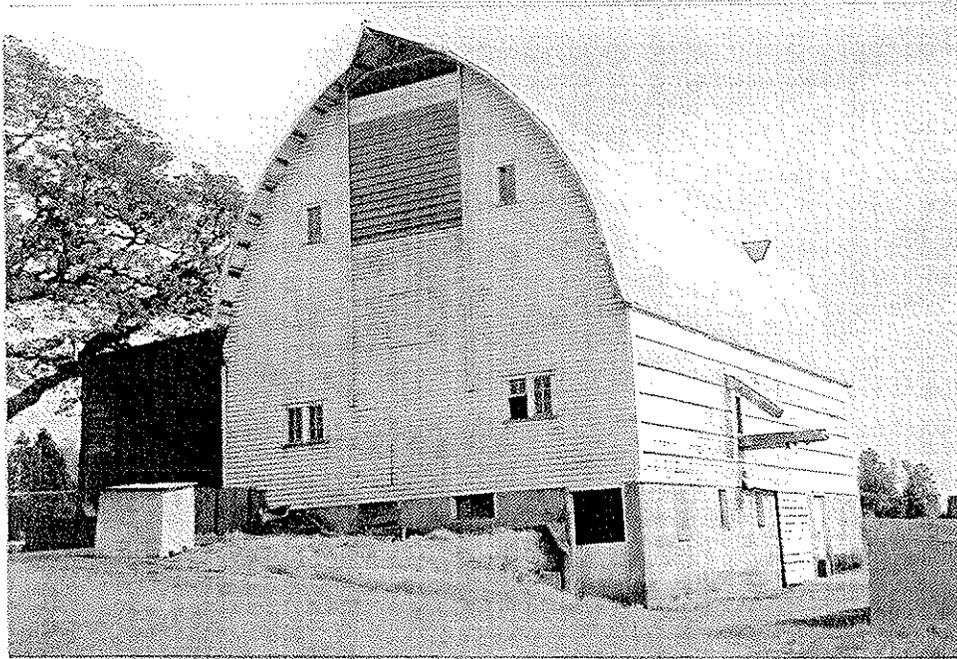


Figure 111. The Stellmacher Barn, a bank barn with a Gothic roof, built in 1924.

The arched roof was employed as early as the 1910s, but was perfected in the 1920s and 1930s. The 1911 edition of *Barn Plans and Outbuildings* by the Orange Judd Company, illustrates a "circular roofed barn" in Nova Scotia but gives the reader no clue as to how the arched roof was constructed.¹ By the early 1920s, the arched-roof barn was a staple of plan books and equipment company catalogues. The earliest construction date recorded during the 1996 survey for a Linn County barn with an arched roof was 1924.

An arched roof that is pointed usually is referred to as a "Gothic roof", whereas an arched roof that is rounded is referred to as a "rainbow roof". Barns with these roof forms have even more loft space; therefore they are very suitable for livestock or dairy farming. Farmers could store more hay in round-roofed and pointed, gothic-roofed barns than in gambrel-roofed ones.² It has been noted that, "...the gothic roof passed through more than two decades of

¹ Orange Judd Company, *Barn Plans and Outbuildings*, (New York: Orange Judd Company), 1911 edition, p. 100.

² Vogeler, Ingolf, "Dairying and Dairy Barns in the Northern Midwest," *Barns of the Midwest*, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 105.

experimentation as new ways of building and using curved rafters in barns evolved..."³

Sawed construction, which was initially used to create the curved rafters, may have first been used in the Northwest where there was an abundant timber supply.⁴ The outside edge was sawed from one-inch boards, measuring eight-to-twelve-inches wide and three-to-four-feet long, in order to create the needed curvature. Then, "...three or four plies were laminated together side by side with nails, with the splices staggered to get the curve needed."⁵ In September 1941, the Oregon State College Farm Building Plan Service issued its revised Extension Circular No. 376 listing the farm building plans then available. One of the plans for a barn measuring 36 x 56 feet was categorized as an "Oregon arch roof -- sawed type."⁶ Another plan designed by the Agricultural Engineering Department refers to the "Oregon Gothic roof", also a sawn design (See Figure 112).

A second type of curved rafter construction involved the use of bent or sprung rafters; developed following a 1916 experiment in Davis, California. "The perceived savings in material and labor required to produce the same contour, by bending instead of sawing, brought the rafters quickly into favor."⁷ The 1921 catalogue of Hunt, Helm, Ferris & Co., The Star Line, states:

Blue prints showing details of Gothic roof construction for a barn...will be mailed upon request. This barn is particularly admired for its attractive appearance. It is easy to build and comparatively inexpensive. The Gothic rafter is made from 1 in. lumber, built up to the required thickness by nailing together several pieces of 1 in. x 4 in. or 1 in. x 6 in. material. The curve is marked out on the loft floor, along which blocks are nailed and to these blocks, the first member of the rafter is bent and nailed and the rafter built to the size required by adding 1" material, which is bent to the curve and nailed. All the rafters are made in one form.⁸

All barns recorded in Linn County during the 1996 survey had bent rafters laminated with nails. Several barn owners who were children when the barns were being built described the method quoted above of laying out blocks on the barn floor. A plan available through the Extension Service of Oregon State College illustrates this method in its plan for "Gothic Rafters Bent

³ Soike, Lowell J., "Within Reach of All: Midwest Barns Perfected," Barns of the Midwest, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 161.

⁴ *Ibid.*

⁵ *Ibid.*, p. 161.

⁶ Oregon State College Department of Agricultural Engineering, "Oregon State College Farm Building Plan Service," (Corvallis, Oregon: Oregon State College Extension Service), Extension Circular No. 376, September 1941, p. 11.

⁷ *Ibid.*

⁸ Hunt, Helm, Ferris & Co., The Star Line, (Harvard, Illinois: Hunt, Helm, Ferris, & Co.), 1921, p. 149.

Type" (Figure 113). The 1934 Schrock Barn has bent laminated rafters composed of five 1 x 4s as suggested in the plan (Figure 114). The 1996 survey revealed that the number of laminated 1 x 4s varied from barn to barn, with rafters ranging from three boards to seven boards in thickness. A barn having laminated rafters that are seven boards thick, the Smucker Barn, used 1 x 3s perhaps reflecting its later construction date of 1946. At least one barn owner noted that a number of barns with rafters composed of fewer than five laminated 1 x 4s have not survived to the present.

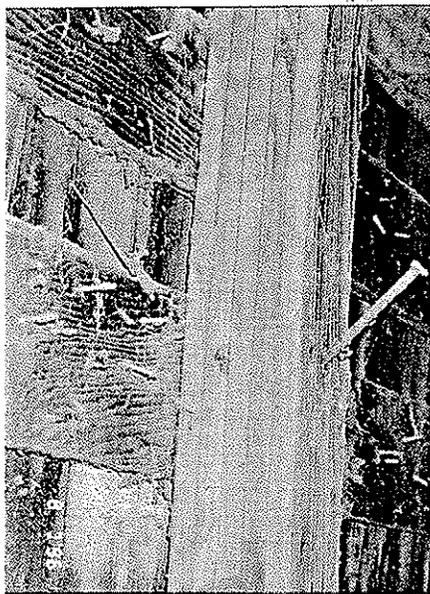


Figure 114. Laminated rafters in the Schrock Barn.

The Loudon Machinery Company introduced an improvement in the Gothic roof design by substituting, at every eight feet, a patented, curved, reinforcing truss that ran continuously from plate to plate. This early 1920s truss, which Loudon claimed was economical to build and simple to raise, lent "enormous strength" to every third or fourth rafter.⁹ Loudon also introduced the concept of rafters extending all the way from the foundation sill on one side to the foundation sill on the other. "This avoided the weak point where the bent rafters joined the upper wall plate, which often had been mounted to the plate by merely toe-nailing, sometimes with the help of braces running from the rafter to the mow floor joist."¹⁰

The Gothic roof entered its final phase of innovation during the 1930s, when modern glues first were used to produce a stronger bent rafter. Experimentation began in 1936, with Guttorm N.

⁹ Soike, p. 162.

¹⁰ Ibid.

were used to produce a stronger bent rafter. Experimentation began in 1936, with Guttorm N. Brekke and Professor Henry Giese, both funded by Weyerhaeuser.¹¹ In May 1939, Rilco Laminated Products, a Weyerhaeuser interest, was incorporated in Minnesota. This company began the manufacture and commercialization of glued laminated rafters. Another company that sold glued laminated rafters was Unit Structures, Inc. of Peshtigo, Wisconsin. The company advertised their Engineered Farm Buildings with unit glue-welded rafters.¹²

Laminated timber was used in the Pacific Northwest as early as 1938. Its first installation is believed to have been in Seattle's Wallingford Brethren Church.¹³ During World War II, Timber Structures, Inc. of Oregon began to manufacture glued laminated timber.¹⁴ No barns recorded during the 1996 survey incorporated rafters laminated with glue.

The Clyde Truss

In the early 1920s, A.W. Clyde, an extension engineer for Iowa State College, developed the Clyde Truss, also known as the Iowa Truss. Used for a gambrel roof, it was less expensive than the Shawver truss, which required more expensive extra-length material. The design, which used gas pipe for shear pins at the ends of each truss, "...tied the ridge, the purlin, and the plate into a single uncomplicated truss to carry the intervening rafters....Clyde's Iowa truss constituted the final innovation in the plank-frame tradition."¹⁵ A cutaway view of a barn with an Iowa Truss is illustrated in Figure 115. The Extension Service of Oregon State College made plans available for the Iowa roof truss (Figure 116).

¹¹ Rhude, Andreas Jordahl, "Structural Glued Laminated Timber: History of its Origins and Early Development," *Forest Products Journal*, Vol. 46, No. 1, January 1996, p. 19-20.

¹² Unit Structures Inc. Catalogues, 1940s.

¹³ *Ibid.*, p. 19.

¹⁴ Rhude, p. 20.

¹⁵ Soike, p. 160.

Dairy Barns, Milk Houses and Milking Parlors

With the prominence of dairying in Linn County in this period, the specialized dairy barn emerged. Dairy barn designs generally accommodated two longitudinal rows of cows with complement of litter and feed aisles. The design might also include bull, maternity and calf pens; a feed room; office; milk room; wash room; cool room or can room. It was recommended that the dairy barn be placed with the long axis north and south in order to secure direct sunlight for as much of the day as possible.¹ Ceiling height was recommended at eight and one-half feet and the width of the barn either 34 or 36 feet with room for two rows of stock. Cows can face out with a single cleaning alley in the center or face in with a feeding alley in the center.² The length of the barn depended upon the size of the herd.³ Different cow breeds also required different stall dimensions.

Concrete for barn foundations, floors, and gutters became common and were required for Grade A dairies. Often, mangers were formed of concrete. Dairy barns had rows of windows along the side ends in response to the recommendation that "Four square feet of glass, well placed, should be provided for each mature animal in the dairy barn."⁴ Above, a large hay mow, beneath a gambrel or Gothic roof, accommodated loose hay which could be dropped through hay holes to the feed aisle below. A silo, or perhaps two silos, were located adjacent to the barn with a door from the inside of the barn to access the silage.

Milk, once stored in spring houses, now needed to be cooled in order to prevent bacterial growth and the milkhouse provided this function. It was advised that the milkhouse be constructed within 6 to 10 feet of the barn with the location such that prevailing winds during the dry season will carry barnyard dust away from it.⁵ By 1947, however, it was reported that:

New thinking has gone into milk house requirements. At one time it was necessary to place the milk house at rather long distances from the milking room or dairy barn. Now the reverse is true. New milk houses should be attached to the milking room or barn, and in most cases city ordinances will permit construction under the same roof when a passageway with two doors is provided between the milking room and the milk cooling and utensil room. This is a big advancement and makes it possible to coordinate feeding,

¹ Foster and Carter, p. 6.

² Foster and Carter, p. 8.

³ Foster and Carter, p. 7.

⁴ Foster and Carter, p. 15.

⁵ Federal Cooperative Extension Service, "Producing Clean Milk," (Corvallis, Oregon: Oregon State College), Extension Service Bulletin 630, Jan. 1944, revised 1947.)

caring for the cows, milking them, and handling the milk, all into an efficient system.⁶

In the 1930s, there was a trend toward separate milking parlors (Figure 117). In 1936 one author remarked that there were two methods for handling dairy herds. The first method involved the use of a dairy barn with cows in stalls where they are fed, watered, milked and kept in overnight. The second method is the loafing barn type with another building where cows are milked. This latter plan, he noted, was growing in popularity.⁷

It was use-experience that changed the stanchion dairy barn into small milking quarters combined with the loafing shed. Hauling out manure and cleaning the barn at least once each day, the difficulty of keeping the cows clean, and the development of big knee and udder trouble because the cows had to stay in stanchions throughout the long winter months, made someone think of a better way for housing cows.⁸

In 1941, plans were available from Oregon State College which illustrated "dairy plot plans". These plans illustrated paved exercise lots, lounging sheds, hay barns, and milking parlors. The Davis Farm, home of the Prairie Rose Dairy, had a large loafing/hay barn, two silos, calf barn, and milking parlor (Figure 106) surrounding a paved exercise lot on three sides.

Sanitation was another factor which led to the development of the separate milking parlor. As early as 1913, one author pointed out that:

Now that the habit and knowledge of cleanliness is more general, it has been observed that the infection of milk is not so much due to the virulent pathogenic germ found in filthy and unsanitary surroundings, as to the bacteria on the dust in the stable, and especially the dust of the feed, grain and hay. For this reason it is desirable to place the milking cows as far as possible from the storage of hay, bedding and the like, which brings up at once the question as to whether it is advisable at all to store hay over the animals, although long custom has established that usage.⁹

In Linn County, many barns continued to have wood stanchions, wood floors and wood walls well into the 1950s. These farms operated Grade B dairies. Grade B dairies received less money for their milk and the milk could only be used for butter, cheese or powdered milk.

⁶ Doane Agricultural Service, The Farm Book: A Guide to Better Farming with Better Buildings, (Portland, Oregon, West Coast Woods, 1947, p. 19.

⁷ Wooley, J.C., Farm Buildings, (Columbia, Missouri: The University Co-Operative Store), 1936, p. 145.

⁸ Doane Agricultural Service, The Farm Book: A Guide to Better Farming with Better Buildings, (West Coast Woods, Portland, Oregon), 1947, p. 7.

⁹ Hopkins, Alfred, Modern Farm Buildings, (New York: McBride, Nast & Company), 1913, p. 21.

Dairy Barn Arrangement

In numerous publications the three aisled dairy barn was advocated. There was a debate, however, concerning whether the cows should face the center aisle or face the windows. In Linn County, both arrangements were found. The following points are taken verbatim from *The Star Line*, the catalogue of Hunt, Helm Ferris & Co. of Harvard, Illinois. This company, which sold barn and barn plans, had offices in Portland, Oregon.

"Where Cows Face In"

This arrangement of the barn has a number of advantages. You can take the feed all down a center alley and distribute it right and left as you go along. It centralizes the work of feeding. Then the herd is divided so you don't have all the cows trying to crowd through one door at the same time.

The out-take chutes for ventilation are located at the sides of the barn where they are out of the way, and do not occupy space which could well be used for other purposes.

Sunlight strikes the gutters directly and they get the full value of its disinfecting properties. It gives you light behind the cows when milking in the morning and at night.

Another advantage of this arrangement is that some prefer to see all the herd from either end of the feed alley.¹⁰

"Where Cows Face Out"

"Advocates of facing the cows out, call attention to the fact that while it may be well to do your feeding from one alley, you nevertheless do three-fourths of the work *behind* the cows. Cleaning and milking take more time than feeding.

They claim that the cows breathe better air when they face out than when they face in.

That it's more important to have the disinfecting action of the sunlight applied to the manger where the cow is fed than to the gutter.

That you've got to build long in-take chutes for ventilation if your cows face in.

That you've got to divide your herd to get it into the barn and if you get a cow on the wrong side of the barn, it causes confusion.

¹⁰ The Star Line. (Harvard, Illinois: Hunt, Helm, Ferris & Co.), 1921, p. 132.

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Where cows face out the supporting posts for hay loft floor can be placed where they will in no way interfere with the arrangement of the stalls.

Then the appearance of both herd and barn is better where cows face out. Cows are always sized up from behind, where they face out, the whole herd is seen at one time.

Furthermore, there never was a barn built, where the cows faced the center, that was wide enough to prevent the wall from becoming spattered with manure. Facing the cows out prevents this. It keeps all the manure along one alley and the gases and fumes are more easily disposed of when they are in one place.¹¹

¹¹ *Ibid.*, p. 133.

EVALUATION

Property Type: BARNS OF THE MID-20TH CENTURY

Property Type Significance: Standardization in barn construction and specialization in agriculture are hallmarks of this period. Out of the design jumble of the early 20th century, the balloon frame, gambrel-roofed barn emerged as the standard in barn construction. The diversified farm often became a specialized farm during this period as increasing mechanization made it costly to purchase equipment for numerous activities. In Linn County, ryegrass production and dairying were in the forefront of specialized agriculture. Ryegrass production required a seed cleaner rather than a barn. Barns that were built during this period were often dairy barns. Others in dairying followed the advice of experts at the time which recommended separate milking parlor, hay barn, loafing barn combinations. With the adoption of the tractor, the automobile and other gasoline powered equipment, barn space required for horses and their accoutrements diminished.

Barns dating from the mid-20th century illustrate several major themes in Linn County history with areas of significance including agriculture and architecture. **Criterion A** of the National Register may be met by barns which reflect agriculture during this period.¹ **Criterion B** of the National Register may be met by barns that are associated with the lives of persons significant in Linn County history, particularly if the individual's contributions were significant within the context of agriculture.² **Criterion C** of the National Register may be met by barns which retain enough characteristics to be considered a representative of the property type.³

Property Type Quantity, Quality and Condition: It is difficult to determine the number of extant barns from the mid-20th century because only a sample, approximately 45, were recorded; many more were located during the reconnaissance survey but it was not always possible, upon cursory exterior examination, to distinguish barns from this period from barns of the first two decades of the century unless a date of construction was provided. As evidenced by the reconnaissance survey, barns of the mid-20th century are far more numerous than their 19th century counterparts and barns of the mid-20th century appear to be more numerous than barns dating to the earlier part of the century.

Registration Requirements: Linn County barns are National Register eligible under **Criterion**

¹ Criterion A of the National Register states that properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history.

² Criterion B states that properties may be eligible for the National Register if they are associated with the lives of persons significant in our past.

³ Criterion C states that properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

A, in the area of agriculture, if characteristics are present which link the barn to agricultural practices of this period. For instance, dairy barns which date to this period may be eligible under Criterion A because they reflect the importance of dairying at this time. Aspects of integrity which should be present to convey this association are design, especially exterior design, location, and setting. Since barns of this period are more numerous, original cladding materials should be present on at least several elevations. (It is rare to find a Linn County barn in which the siding has not been replaced on the south and west elevations). Modifications to original door openings, window openings, and window sash should be limited. Metal roofs, while not endorsed, have become almost a universal feature of the Linn County barn, primarily because of the expense of shingle or shake roofs. Ideally, some aspects of the original interior spatial organization should be retained linking the barn to agricultural practices of the period. Silos and milkhouses inside of the barn, or in close proximity to the barn, are good indicators of dairy activity. The barn's location and rural setting should be intact in order to foster the associative qualities. Barns which have been converted to grass seed cleaners in the 1920s or 1930s may also be eligible under Criteria A. Integrity assessments would center on the adapted design, not the original barn design.

A barn may be illustrative of a person's important achievements especially if the area of significance for those achievements is agriculture. Of special interest would be barns associated with individuals who made significant contributions to the dairy industry or grass seed industry. Barns are eligible for the National Register under **Criterion B** if they are associated with the lives of persons significant in Linn County history, and maintain the characteristics by which that association is conveyed. The most important aspects of integrity for barns eligible under Criterion B are exterior design, location, and setting, sufficiently unaltered so that the property would be recognizable by the associated individual. A preliminary list of individuals that may have made significant contributions in the area of agriculture are listed in Appendix C.

Barns of this period may meet the requirements of National Register **Criterion C** if they clearly contain enough characteristics to be considered a representative of this property type. Design, materials and workmanship are more important than location and setting so that moved barns, and barns located in an area where the rural setting has been compromised, may still be eligible. To be considered a good representative of the type, a barn should exhibit the pattern of features common for barns built during this period. Table 4 summarizes these characteristics. Since barns of this period are more numerous and standardized, the integrity threshold should be high for barns illustrating the patterns common to barns of this period. Since one of the most important design aspects of barns is the method of construction, a barn may be significant for framing regardless of the integrity of other design aspects. In this case, integrity of materials and workmanship are paramount. Barns which fall into the below categories may be eligible under Criterion C if they retain those characteristics by which their significance is understood.

- * Late examples of timber frame barns.

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- * Barns which illustrate methods of construction that are rare, such as log construction,
- * Barns illustrating variation and individuality. For instance, barns with masonry construction.

- * Barns for which the plan can be traced to one of the following: the Regional Plan Service; Oregon State College; pattern books of the period; a barn planning service; catalogue such as Sears or Montgomery Wards; or a barn that is pre-cut and shipped by a company.

- * Barns in which the building traditions of other parts of the country and/or world are evident.

- * Barns with arched Gothic or rainbow roofs (These barns are rare with only about 15 extant examples.

- * Specialized barns, such as dairy barns, that illustrate spatial arrangements peculiar to that barn type.

- * Barns which were built using metal cladding.

HISTORIC OVERVIEW

Religious and Ethnic Immigration, 1845-1945

Many settlers migrated in groups formed of extended families and neighbors of like endemic and religious convictions. For instance, in the early period of settlement, the Oakville and Union Point areas were identified as Presbyterian neighborhoods; the Providence area was associated with Baptist settlement. The social character of neighborhood settlements could therefore have an impact on building, with regional variation within the county. Barns may provide a better opportunity for observing cultural convention and affinity than other building types. The groups mentioned below, while not inclusive, are groups which have left their imprint on the character of the county.

The German Baptist Brethren

Members of the German Baptist Brethren faith, sometimes referred to as Dunkers or Dunkards, settled in Linn County at an early date (Figure 118). Among the families belonging to this group were the Hardman, Backus, Peebler, Baltimore and Ritter families. This group settled on rich agricultural lands between the current cities of Lebanon and Albany. The Wigle family were also originally Brethren but settled further to the south, east of Harrisburg, Oregon. In 1854, Daniel Leedy settled with this Linn County group and became the first Brethren minister on the Pacific Coast. The Brethren in the Oregon Territory established the first congregation on the west coast in this location in 1855 or 1856 with Leedy as minister.¹ This congregation was first known as the South Santiam congregation.² The name was eventually changed to Willamette Valley congregation. The congregation expanded from the original 23 members to 100 members by 1881, the year that the area was divided into two congregations: Salem north of the Santiam River, and Lebanon, south of the Santiam. M. M. Bashor and David Brower were the congregation's elders assisted by Leedy, A.H. Baltimore and Philip Workman. By 1907, the Lebanon congregation had only 16 members and in 1912 had the beginning membership of 23. The congregation, albeit small, continued to meet, eventually forming the Sunrise Community Church in Albany. In 1962, the oldest Oregon congregation of this denomination was disbanded by the district.

Only one barn of this group was identified in previous surveys. The Gideon Backus Barn, probably built in the 1850s, is a side-opening barn typical of pioneer barns in Linn County (Figure 9). Apparently, this barn does not reflect the Brethren tradition in barn building. According to The Brethren Encyclopedia, because "...of the predominance of

¹ The Brethren Encyclopedia, 3 Vols. (Philadelphia: Brethren Encyclopedia, 1984), p. 14.

² *Ibid.*

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agriculture as a source of Brethren livelihood in the 18th and 19th centuries...farm buildings were of primary importance. It is noted that the Brethren followed the Pennsylvania-German pattern in architectural style and placement of barns....Barns...were the two level or "bank-barn" style."³ Barns were also the location of large gatherings such as love feasts and Annual Meetings throughout the 19th century.⁴

³ *Ibid*, p. 89.

⁴ The Brethren Encyclopedia, p. 90.

Mennonite Settlement in Linn County

In 1976, Hope Lind Kauffman, author of *Apart and Together: Mennonites in Oregon and Neighboring States 1876-1976*, noted that "The ratio of members in Oregon's Mennonite and related groups to the total of Oregon's population is almost twice that of all United States Mennonite groups to the total U.S. population."⁵ The first Mennonites to settle in Oregon were Christian C. and Magdalena Wenger, and John and Elizabeth Lichty who accompanied the Wengers. They settled in the Hubbard area of Marion County in 1876.⁶ In ca. 1880 the first Amish Mennonites moved to Oregon, and in 1887 the Joseph Maurer Family, Amish Mennonites, purchased a farm located four miles north of Lebanon, Oregon in Linn County. The family consisted of Joseph Maurer, born in the Alsace province of France, his wife Barbara Gerig Maurer, Joseph's twice-widowed mother, Barbara Conrad, and several small children. The Maurer Family came to Oregon from Davis County, Iowa.⁷ For seven years they were the only Amish Mennonites living in Linn County.⁸ In the fall of 1894, three other Amish Mennonite families headed by Jacob and Mary Eicher Roth; Daniel and Katherina (Roth) Erb; and Christian and Magdalina (Swartzendruber) Kennel, moved to Linn County from Thurman, Colorado.⁹ In 1895, Jacob Roth was ordained as a minister and meetings were held in his home.¹⁰ Eventually, they began meeting in the former German Baptist Brethren Church building in the area.¹¹ In 1911 they purchased an acre of land and constructed a meeting house. Christian Kennel, who was also a barn builder, was the main carpenter. The congregation was called Fairview.

"Soon after Fairview organized, other families with names including Widmer, Christner, Schlegel, Heyerly, Neuschwander, Eicher, Gerig, Sutter, Ropp, Yutzi, Nofzinger, and Schrock moved to the area. Several joined the Albany Mennonite Church when it organized in 1899 and some joined Harrisburg. But most stayed to swell the ranks at Fairview. Later, others moved to Linn County, especially because of the prolonged drought in Nebraska and Colorado in the mid-1930s. Fairview became the second largest congregation in its conference, with a

⁵ Hope Kauffman, *Apart and Together: Mennonites in Oregon and Neighboring States 1876-1976*, (Scottsdale, Pennsylvania: Herald Press, 1990), p. 19.

⁶ Lind, p. 27.

⁷ Gerig, Irvin, "History of the Fairview Mennonite Church," *OMHGS Newsletter*, Vol. 2, Number 1, February, 1989, p.1.

⁸ Lind, p. 51.

⁹ Gerig, p. 1.

¹⁰ *Ibid.*

¹¹ *Ibid.*

membership high of 426 in 1965..."¹²

Fairview and Hubbard's Zion churches were both Amish Mennonite but their corporate personalities soon developed differently.¹³ Fairview had more members who had immigrated directly from Europe or come from families of more recent immigrants who had first settled in Ontario, Canada, earlier in the 1800s. More of Zion's members came from immigrant families of the 1700s".¹⁴

The Albany Mennonite Church [Old Mennonite] was established in 1899 and the Harrisburg Conservative Amish Mennonite Church established 1911. Minister Daniel Kropf and his wife Anna Hostetler and their family moved to Harrisburg and soon eight other families from Hubbard's Zion congregation followed. Charter members of the Harrisburg church include: Hostetler, Kropf, Miller, Neuschwander, Smucker, Stutzman, and Widmer families.¹⁵

In the 1930s, another influx of Mennonites came to the Albany area from the drought ravished regions of the United States. Included were the Beckler, Birkey, Jantzi, Stutzman and Schweitzer families.¹⁶

The impact of this settlement on the architectural character of the portions of Linn County settled by these various Mennonite groups has never been studied. In other areas, Pennsylvania barns are often a indication of Mennonite settlement. Examples of Pennsylvania barns, two level bank barns which include the diagnostic forebay, have not been located in association with Mennonite settlement in Linn County although one has been identified in the Hubbard vicinity of Marion County. The flat topography of the region settled by the Mennonites would certainly have been a limiting factor for this barn choice. Furthermore, Hope Lind notes that

"In contrast to some Mennonites in the West and the Midwest who had settled in territories even before they achieved statehood, Oregon's earliest Mennonites arrived after two or three generations of farmers had taken their pick of land and Oregon had been a state almost twenty years. Some Oregon Mennonites did clear timber and break new sod, but many purchased or rented land which others had

¹² Lind, p.53.

¹³ Lind, p. 54.

¹⁴ *Ibid*, p. 54.

¹⁵ Lind, p. 56.

¹⁶ Gerig, p. 2.

already tamed."¹⁷

This land often included established farm building groups.

There were several Mennonite carpenters who were known to build barns in Linn County. C.R. Kennel was responsible for the construction of a number of barns in the Lebanon-Albany area. Prior to coming to Linn County, he had built barns in Ontario, Canada. Only two barns, built for his children, have been identified as examples of his work. Both barns have details which were not observed in other Linn County barns. A barn built for his son John Kennel in 1925 is notable for its use of louvers in the walls (Figure 119, top left). The Krabill barn (Figure 50) has atypical framing.

Another Mennonite barn builder was J.S. Yoder who reportedly built barns in the Harrisburg area and as far north as Albany. The only example of a barn known to have been erected by him is his own barn just east of Harrisburg (Figure 119, top right). This gambrel-roofed, balloon frame barn is similar in exterior appearance to other barns built in Linn County at the time; nevertheless, his son, Glenn Yoder, who still owns the property, described the barn by referring to the feed aisle as the "fudergang" and a pent roof on the east elevation as the "foreshoot" noting that these were the terms used by his father whose family hailed from Pennsylvania.

The Smucker Family, a Mennonite family originally from Orville, Ohio, came to the Harrisburg area after living near Hubbard. A new barn was built in 1946 after a trip back to Ohio and Pennsylvania. Wilton Smucker, the current owner, recalled that the trip provided his father with the idea of an "overshoot" and block walls. With walls built of pumice block, the Smucker barn is one of only two masonry barns in the county (Figure 119, bottom right).

¹⁷ *Ibid.*, p.39.

The Pennsylvania Barn

The Pennsylvania Barn is a two level bank barn with a forebay that has antecedents in Switzerland.¹ The template was carried to Pennsylvania in the 1700s by Germanic emigrants. Today, as a result of diffusion, Pennsylvania barns are found in various areas of the United States and are considered excellent markers by which to identify areas of Pennsylvania settlement especially by Amish, Mennonites and German Baptist Brethren.²

Ensminger, author of the book, *The Pennsylvania Barn: Its Origin, Evolution, and Distribution in North America*, (1992), describes the characteristics of a Pennsylvania barn:

It is always banked to provide access to the upper level. This level is used to process and store feed grains, hay, and straw. It contains several sections or bays. Bays entered directly from the bank have large doors and function as threshing or machinery floors; those adjacent to the threshing floors serve as mows for storage of hay and straw. The upper-level space to the fore of the barn, extending over the stable wall below, is the forebay. Windows in the front wall of the forebay provide light for this area. An opening in this wall, formerly provided draft for hand threshing and winnowing. Through this opening straw can be tossed to the barnyard below...The forebay area may be continuous with the mows providing additional storage space. Usually, it is partitioned from the mows, and houses a granary with bins for various feed grains...The lower level of the Pennsylvania barn has always been used to house livestock, including cows, beef cattle, and horses...In many barns, pens for calves and even pigs, sheep, and chickens, can be found...Access between the stable and the barnyard is through the double split doors in the front wall, below the forebay. Gable end doors in Pennsylvania barns, when they occur, provide access to the feeding alley...³

Ensminger notes that there can be significant variations in details of the design and construction of Pennsylvania barns because the barn evolved as agriculture changed.⁴ The essential identifying feature, however, is the forebay.⁵

Mennonites have proven to be an excellent index group for predicting the occurrence of

¹ Ensminger, Robert F, *The Pennsylvania Barn: Its Origin, Evolution, and Distribution in North America*, Baltimore and London: The John Hopkins University Press, 1992.

² *Ibid.*, p. 164.

³ Ensminger, pp. 53-55.

⁴ *Ibid.*, p. 52.

⁵ *Ibid.*

Pennsylvania barns.⁶ Additionally, Ensminger observes that "Members of the various Germanic Baptist Brethren churches, called Dunkards or Brethren, were also part of the population of Pennsylvania-German settlers who moved beyond the Pennsylvania hearth. One could expect that the Brethren Pioneers also participated in the diffusion of the Pennsylvania barn."⁷

One Pennsylvania Barn has previously been identified in Oregon. The Ivan Kropf Barn, built in 1889 near Hubbard, Oregon. Hubbard was the earliest site of Mennonite settlement in Oregon and the Kropf family is associated with this group. Nearby is the community of Aurora, a utopian colony also with Germanic roots founded in 1856.

The 1996 barn survey in Linn County located one Pennsylvania Barn, the Michael Ryan Barn built in 1910 (Figure 120). The builder and owner of this barn was not Mennonite but did hail from Pennsylvania. The barn has all the diagnostic features of a Pennsylvania barn but, because of its date of construction, is built using 20th century construction methods and has a gambrel roof. This is analogous to the barns of Central Wisconsin which Ensminger notes "...being late examples of the Pennsylvania barn, frequently have gambrel roofs....The basement stables follow a center-aisle plan with primary access provided by gable-end doors rather than under-forebay doors. This efficient arrangement permits a larger and more easily serviced dairy herd."⁸

⁶ Ensminger, p. 161.

⁷ *Ibid.*, p. 164.

⁸ Ensminger, p. 90.

Catholic Settlement in the Jordan Valley

In the mid-1880s, a group of about fifty German Catholic families from Minnesota arrived in Linn County.¹⁸ The events precipitating this colonization can be traced to the Baden region of Germany in the 1830s. There, Father Joseph Maria Albrecht joined the priesthood as a member of the Society of the Precious Blood after separating from his wife so that she and his daughter could join a convent. Eventually, Father Albrecht came to Ohio with other members of his order. In Ohio, Albrecht angered members of his parish and the church hierarchy with some of his views. Eventually he was suspended from his duties. Angered by this treatment, Father Albrecht decided to leave the area and, with a group of loyal parishioners, he moved to Rush Lake, Minnesota. A 700 acre community was established complete with church, convent, school and farms. Father Albrecht was eventually excommunicated from the Catholic Church.

Father Albrecht died in 1884. Prior to his death, he chose Anton Bender, Christof Silbernagel and Victor Eifert as trustees. It was decided to leave Minnesota for a new settlement in the west. These men knew of acquaintances from Ohio who had settled in Scio, Oregon. Shortly thereafter the colony -- which consisted of approximately 90 people, including 20 religious members including nuns -- settled in the Jordan Valley, a tributary stream valley in the foothills east of Scio, Oregon. Early members of this community are listed in Table 12. Land had been purchased by the trustees for the group to establish farms and erect a church. Eventually a priest, Father Joseph Buchholzer, was assigned to the group by the Archdiocese of Portland.

Our Lady of Lourdes Church continues to be the focal point of this community which is still home to many of the descendants of the original members of the Catholic colony. The architectural character of the Jordan Valley is distinctive in Linn County. Several barns of this group built upon their arrival in the 1880s were recorded during the 1996 survey. Compared to other barns being built in Linn County during this period, the materials used for these barns were less processed. Log joists and hewn timbers were used in all 1880s barns of this group recorded. In other areas of Linn County at this time, it appears as though sawn timber frames predominated. The interiors of the barns have been altered but all of the recorded barns have traditional transverse arrangements of four or five bays. The Foltz Barn (Figure 121) has a double outshed, the only example observed in the county.

¹⁸ The information on the history of this Catholic Group is summarized from Centennial History: 1885-1895, Our Lady of Lourdes, Jordan, Oregon. (Eds.) Barbara Bentz, Linda Duman, and Father Gregory Moys, North Santiam Newspapers, 1985.

Table 12. List of early members of Our Lady of Lourdes Church from Centennial History, 1885-1985, Our Lady of Lourdes, 1985.

Basel, Wm. Franklin	Riesterer, Joseph and Mary
Bender, Anton	Reister, Henry
Bentz, Jacob and Sophia (1904)	Rohwein, Frank
Boedigheimer, Bruno and Maria	Salzi, Carl
Duman, Henry and Johanna (1922)	Schneider, Christian
Eifert, Victor and Matilda	Schwindt, Joseph
Fiedler, Pete and Rose (1914-1915)	Shelton, Haman
Fink, Joseph	Silbernagel, Cristof
Fink, Ignatius	Stauang, Carl
Foltz, John	Thomas, John
Gerard, Meinrod	Thomas, Henry
Heuberger, Henry	Voltin, Leo
Hilger, Frank	Westby, Scott
Jungwith, Jordan	Yost, Benjamin
Krantz, Marcus and Teresa	Ziglinski, Fred
Lackner, Anton	Ziglinski, John
Lulay, Clement	Zurfluh, Anton
Neal, Peter and Mahala	Zurfluh, Henry
Pepperling, Alvin	
Quinter, Benedict	

Czech Settlement

People of Czech nationality are from the ancient kingdoms of Bohemia, Moravia, and Silesia. Slovaks are primarily from the province of Slovakia. Czechoslovakia came into existence in October of 1918 and, by the treaties of St. Germain (1919) and Trianon (1920), consisted of Bohemia and Moravia, the Austrian province of Silesia, the Hungarian Province of Slovakia, and a district of northeastern Hungary called Ruthenia. The formation of Czechoslovakia occurred after the establishment of a rural Czech community in Linn County.

The first Czech settlers came to Linn County in the period between 1880 and 1890. It is likely that this settlement was facilitated by the completion of the Oregonian Railway through this area in 1880 with stations at West Scio and Crabtree, the main areas of Czech settlement in the county. Early families included the Cladek, Youngs, Svododa, Horsky, Stepanek, Suchanek, and Faltus Families.¹⁹ Table 13 lists some Czech families mentioned in The Santiam News in 1899. By 1900, families and individuals with the surnames of Wesley, Stastny, Andrlik, Bartu, Roner, Ondrej, Schinost, Lamplot, Prokop, Oupor, Posvar, Shimanek, and Vasek among others had joined the growing colony.²⁰ "Some came from the old country, and some were 'second jumpers' from Nebraska, Michigan, the Dakotas, Wisconsin, Illinois, and Iowa."²¹ It appears that the majority of Czechs settling in Linn County had lived elsewhere in this country before moving to Oregon, although their tenure in these other localities may not have been lengthy. Table 14 lists members of this community from the Thirteenth U.S. Census (1910); Table 15 lists members from the Fourteenth U.S. Census (1920). The greatest influx occurred in the first decade of the 20th century; in 1910, there were 1,709 individuals in Oregon born in Bohemia or Moravia, up from the 231 figure in 1900.²² Figure 122 illustrates the areas of the state where this population was concentrated with Linn County having the densest settlement. The Czech population was centered in the north part of the county near Scio, Oregon, although there were several families near Harrisburg in the southern part of the county, including the Balkovich Family a member of which was a local barn builder.

Noble and Cleek describe a Czech Barn as "27-30 feet by 48-80 feet, with an elongated rectangular plan, wagon doors on the gable end, one or two smaller doors on the side, fieldstone walls, and a gable roof. Small windows are usually high on the side walls.

¹⁹ "Tolstoj Lodge Plays Active Part in Richardson Gap History," Lebanon Express, Friday, November 1, 1968.

²⁰ *Ibid.*

²¹ "ZCBI Halls: reminders of Czechoslovakian settlers," The Lebanon Express, Mar. 31, 1977.

²² Capek, Thomas, The Cech (Bohemian) Community of New York. (New York: Czechoslovak Section of America's Making, Inc.), 1921, p.15.

Sometimes exterior walls are plastered and whitewashed.²³ "Sometimes, a barn was attached to the gable end of the house. In fact, the European farmstead often consisted of a courtyard created by series of connected single-pile units [and]...some evidence of loosely arranged courtyard plans of mostly free-standing structures can be found on a few Czech-American farms"²⁴

While an attempt was made in the 1996 survey to locate barns built by these Czech settlers, time prevented a thorough identification. Several barns were recorded from this group, however, although none of the barns were Czech barns as described above by Noble and Cleek. Without further study, it can only be noted here that there were barns and/or farmsteads that had some characteristics that were not in keeping with the barn building traditions of Linn County at that time.

The 36' x 44' Roner Barn, built in ca. 1900, is the only barn in the county to be constructed of hewn logs (Figure 123). The barn's rafters are connected with a pinned tongue and fork joint at the ridge, also singular in the county. The Kruml Barn, probably built in the first decade of the 20th century, had unusual framing detail with the tie-beams resting on the plates (Figure 124). In 19th and 20th century timber frame barns in the United States, it is rare to see the tie beam resting on the plate. Andrew L. Nash, in his article entitled, *The American Timber Frame*, notes that in 20 years of restoring barn frames in central New York, he had observed only one barn in which the tie beams rest on the plate. He points out that Henry Glasie's 1974 study, *Barn Building in Otsego County*, reinforces his observations, with Glasie reporting one frame of this type in the 2,000 barns examined.²⁵ In Linn County this framing anomaly was observed in only one other barn, the Zeller Barn, which was built for or by a German immigrant (Figure 125). The Kruml Barn's front transverse drive is also atypical (Figure 126).

Because many of the Czech settlers in this region lived elsewhere in the United States prior to their move to Oregon, it is possible that they had already assimilated the contemporaneous barn building practices of the areas in which they lived, primarily the Midwest, and were more up-to-date than native Oregonians. The Kotan Barn on Oupor Rd., built in 1911, is an early example of a barn incorporating balloon framing in Linn County.

There were also non-Czech owned barns constructed by Czech builders. Thomas Prospal

²³ Noble, Allen G. and Richard K. Cleek, *The Old Barn Book: A Field Guide to North American Barns and Other Farm Structures*, (New Brunswick, New Jersey: Rutgers University Press), 1995, p. 112.

²⁴ Rau, John E. "Czechs in South Dakota," *To Build in a New Land: Ethnic Landscapes in North America*, (Baltimore: The John Hopkins University Press), 1992, p. 292.

²⁵ Nash, L. Andrew, *The American Timber Frame*, *Timber Framing*, No. 37, Sept. 1995, p. 11.

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was a Czech builder who was known to have constructed a number of barns in Linn County including the Norman Barn built in 1921. The ca. 1920 Leever Barn was reportedly built by a crew of Czech builders who built a number of barns in the Scio region.

In the south part of the county near Harrisburg there were also several families of Czech descent including the Balkovich family. Michael Balkovich was a barn builder.

Table 13. Czech surnames listed in The Santiam News in 1899.²⁶

August 11, 1899

Bartak
Holub, John, Joseph and Frank
Mazachek
Schindler
Cibulka

December 23, 1899

Roner
Boyanousky
Stasek
Bacak
Rubesh
Buresh
Pesek
Dobrovsky
Bartu
Menhart
Walter

²⁶ Bates, p. 69.

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Table 14. Austrian/Czech natives that were heads of households in the 1910 U.S. Census of Linn County Oregon. Birthplace of children noted to indicate that many of these families lived in other areas of the United States prior to coming to Oregon. (Many spellings are probably not accurate.)

LACOMB PRECINCT

Charles F. Rendla (Aust./Bohemia) Children
Oklahoma
Frank Krumel (Austria)
Joseph Holub Sr. (Austria)
Frank Bartu (Austria) Children Nebraska
Frank J. Rooner (Austria)
Matthew Goge (Austria) Children Wisconsin
John Kotan (Austria) Children Iowa and Nebraska
Emil Brodecky (Austria) Child Nebraska
Alois Vana (Austria) Children Minnesota

NORTH AND SOUTH SCIO PRECINCTS

Frank Tichy (Austria/Bohemia) Children Illinois
John Chrz (Austria/Bohemia) Children Minnesota
and Washington
Louis Vana (Austria/Bohemia)
Joseph Ambrosck (Austria/Bohemia) Children
Nebraska
Joe E. Shimanek (Austria/Bohemia)
Mike Svaboda (Austria/Bohemia) Children Michigan
Joe Walter (Austria/Bohemia)
Joseph Liska (Austria/Bohemia) Children North
Dakota and Minnesota
Matthew Lobenger (Austria/Bohemia)
John Saucek (Austria/Bohemia) Children Iowa
Ignatus Faultus (Austria/Bohemia)
John Shimanek (Austria/Bohemia) Child Nebraska
Francis Wesely (Austria/Bohemia) Children Kansas
Antone Holceek (Austria/Bohemia) Children
Washington and Michigan
Frank Raspraska (Austria/Bohemia) Children
Minnesota
Frank J. Krumel Jr. (Austria/Bohemia) Children
Iowa
Thomas B. Propst (Austria/Bohemia) Children
Wisconsin and North Dakota
Annie Faultus (Austria/Bohemia)
Ludwick Young (Austria/Bohemia)
Frank Vorka (Austria/Bohemia)
Albert Young
(Austria/Bohemia) Children Kansas
Joseph Young (Austria/Bohemia)

Josie Holab (Austria/Bohemia)

NORTH AND SOUTH SCIO PRECINCT
CONTINUED

Frank Dobrovsky (Austria/Bohemia)
Antone Karnock (Austria/Bohemia) Children
Minnesota
John Egr (Austria/Bohemia) Children Michigan
Henry Dozal (Austria/Bohemia)
Anton Stepanik (Austria/Bohemia) Children
Nebraska
Vojtch Cladek (Austria/Bohemia) Children Nebraska
Joseph Lamplot (Austria/Bohemia) Child Nebraska
Charles Posvan (Austria/Bohemia) Children
Nebraska
Adolph Grovlick (Austria/Bohemia) Children
Wisconsin and Nebraska
Joseph Oupor (Austria/Bohemia) Children Minnesota
Frank Dobrovsky Sr. (Austria/Bohemia) Child Iowa
Antone Liska (Austria/Bohemia)
Joseph Dorovsky (Austria/Bohemia) Children Iowa
Rudolph Borovicha (Austria/Bohemia) Children
Iowa
Vinsel Prokop (Austria/Bohemia) Children
Minnesota and Oklahoma
Joseph Vasek Sr. (Austria/Bohemia)

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Table 15. Czech natives who were heads of households in the 1920 U.S. Census of Linn County Oregon. (Many spellings are probably not accurate.)

North Scio

John Schindler (Zchecke Slovak)
Jos. J. Roner (Zchecke Slovak)
Joes S. Novak (Bohemia)
Thomas B. Proshal (Bohemia)
Charley Tucek (Bohemia)
John Shimanek (Bohemia)
Henery Faltus (Bohemia)
Joseph Patrny (Bohemia)

South Scio Precinct

Frances Stich (Bohemia)
Joseph Timka (Bohemia)
Antone Kolub (Bohemia)
Frank Kruml (Bohemia)
Frank Rosprafka (Bohemia)
Charles Pletka (Bohemia)
Joseph Ambrosek (Bohemia)
John Jiroch (Bohemia)
John S___k [?] (Bohemia)
Ignatius Faltus (Bohemia)
Lidwrick Young (Bohemia)
Anton Flatus (Bohemia)
Frank Veveraka (Bohemia)
Albert Young (Bohemia)
Jose Snirdl (Bohemia)
V. Prokop (Bohemia)
Mat ___doubeck (Bohemia [?])
Frank Dobrosky (Bohemia)
Joe Roosman (Bohemia)
Joe Nimick (Bohemia)
Julian Hrauk (Bohemia)

Providence Precinct

Anton Stepanek (Bohemia)
Frank J. Roner (Bohemia)
John Egu (Bohemia)
Rudolph R.B. Borovicka (Bohemia)
Joseph Lamplot (Bohemia)
Ladislava Kruml (Czechoslovak)
Frank Kruml (Bohemia)
John Kotan (Bohemia)

Joe Holub (Bohemia)
Joseph Opur (Bohemia)
Anton Kebza (Bohemia)
Alois Vana (Bohemia)

Shelburn Precinct

Joseph Novak (Bohemia)
Frank Novak (Bohemia)
John Chijtil (Moravia)

Mill City Precinct

Charles Dolegal (Bohemia)
Joseph Padrabsky (Bohemia)
Anton Waltr (Bohemia)

Jordan Precinct

Joseph Mlynar (Bohemia)

Lacomb Precinct

Joseph Kruml (Bohemia)
Frank Chladek Sr. (Bohemia)
Prokop J. Chladek (Bohemia)

North Harrisburg

Michel Balkovic (Czechoslovakia)

EVALUATION

Property Type: ETHNIC BARNs

Property Type Significance: Barns associated with various ethnic groups that have settled in Linn County illustrate several themes in Linn County history; areas of significance include ethnic heritage, agriculture and architecture. **Criterion A** of the National Register may be met by barns that are associated with various ethnic groups that have made a significant contribution to the broad patterns of Linn County history.¹ **Criterion B**² of the National Register may be met by barns that are associated with the lives of persons significant in Linn County history, particularly if the individual's contributions were in the areas of agriculture and ethnic heritage. **Criterion C**³ of the National Register may be met by barns which illustrate the building traditions of ethnic groups in other parts of the country and/or the world.

Property Type Quantity, Quality and Condition: The number of extant barns associated with various ethnic groups in Linn County is not known. Based on the 1996 survey, in which a number of ethnic barns were recorded, it is evident that there are barns in Linn County which reflect the building traditions of other parts of the nation and the world. Further survey work will undoubtedly identify more of these barns. Toward that goal, the lists of individuals associated with various ethnic groups has been provided so that the context can be used to predict the locations of associated barns.

Registration Requirements: Linn County barns are National Register eligible under **Criterion A**, in the area of ethnic heritage, if the barns are associated with an ethnic group which has made an important contribution to the pattern of Linn County history, and the barn is sufficiently unaltered to convey that association. The most important aspect of integrity for barns nominated under Criterion A in this area is exterior design, location and setting. Original cladding materials should be present on at least two elevations. (It is rare to find a Linn County barn in which the siding has not been replaced on the south and west elevations). Barns should have a majority of original door openings, window openings, and window sash. Metal roofs, while not endorsed, have become almost a universal feature of the Linn County barn, primarily because of the expense of shingle or shake roofs. For a barn to also meet Criterion A in the area of agriculture, ideally some aspects of the original interior spatial organization should be retained linking the barn to agricultural practices of the ethnic group. The barn's location and

¹ Criterion A of the National Register states that properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history.

² Criterion B states that properties may be eligible for the National Register if they are associated with the lives of persons significant in our past.

³ Criterion C states that properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

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rural setting should be intact in order to foster the associative qualities.

A barn may be illustrative of a person's important achievements especially if the area of significance for those achievements is agriculture. A barn may meet the requirements of National Register Criterion B, in the area of ethnic heritage, if it is associated with an individual that has made significant contributions and is a member of ethnic group in Linn County. The barn should be sufficiently unaltered to convey that association. The most important aspects of integrity for barns eligible under Criterion B are exterior design, location, and setting, sufficiently unaltered so that the property would be recognizable by the associated individual.

Barns may meet the requirements of National Register **Criterion C**, in the areas of architecture and ethnic heritage, if they illustrate enough characteristics linking the barn to the building traditions of ethnic groups in other parts of the country and/or the world. Design, materials and workmanship are more important than location and setting so that moved barns, and barns located in an area where the rural setting has been compromised, may still be eligible. Since the characteristics are variable, the barns should retain those characteristics by which their significance is understood. Since one of the characteristics may be method of construction, a barn may be significant for framing; integrity of materials and workmanship are paramount.

RECOMMENDATIONS

RECOMMENDATIONS GOALS AND PRIORITIES

"Barn owners, even if they value their barns and are inclined to preserve them, face many challenges of a technical and institutional nature. If their dilemma is to be eased, strategies for barn preservation and reuse must be designed and implemented. Preservation options must be cost effective. Such preservation strategies must address both the nature and quality of the barn as a material artifact and the larger system or context in which the barn exists."¹

The Participants

In addition to individual owners of barns, the following organizations have been identified for their involvement in agricultural and/or historical activities in Linn County. In achieving some of the goals recommended, the assistance of one or more of these groups may be desirable. The groups include: the Linn County Extension Association; the Linn County Farm Bureau; Women in Agriculture; Linn County Historic Resource Commission; Linn County Planning Department; Linn County Board of Commissioners; Linn County Historical Society; Future Farmers of America; Scio Lamb and Wool Fair; the Sheep Skin Review (Scio); Timber Framers' Guild (Linn County members); various Linn County Grange organizations; and the Linn County Tourism Coalition.

The Threats

"Although the decline of barns in the urban fringe is of great concern, the number of barns lost in "suburbanizing" areas is much lower than the number being lost in more remote rural areas...more barns are disappearing due to neglect than to bulldozers."²

"The out-of-date barn, hog house or feeding shed can be just as expensive as the out-of-date machine."³

During the 1996 barn survey, the survey crew observed several trends. Many wooden barns in the county are either unused or, used for primarily for storage of items not associated with the current agricultural operation. Barns actually used for agricultural purposes usually stored hay and/or farm equipment. Very rare were barns currently housing livestock.

¹ Dandekar and MacDonald, p. 261.

² Dandekar, Hemalata C. and Eric Allen MacDonald, "Preserving the Midwestern Barn," Barns of the Midwest, Eds. Allen G. Noble and Hubert G.H. Wilhelm, (Athens, Ohio: Ohio University Press), 1995, p. 262.

³ Doane Agricultural Service, The Farm Book: A Guide to Better Farming with Better Buildings, West Coast Woods, Portland, Oregon, 1947.

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Few Linn County Barns are in good physical condition. For many barns, maintenance has been deferred for years to a point where structural damage has occurred. Now the repair costs are too great. Farmers consistently reiterated that the cost of barn repairs was prohibitive especially since the building was not being used in their current operations. For instance, for one farmer with a gable- roofed, average-sized barn, the price quoted for a metal roof was \$17,000. In other cases, we were told that no one could be found to do the work as in the case of one farmer looking for someone to put a metal roof on a Gothic-roofed barn.

Opportunities

Multiple Property National Register Submission

Because of the recent revisions to Statewide-Land-Use Planning Goal 5, jurisdictions are encouraged to use context-based planning for cultural resources. One of the tools Linn County has to help preserve historic properties is an ordinance which reviews alterations and demolitions of properties listed on the Linn County Register and National Register of Historic Places. With the completion of a survey and a contextual study of barns, a multiple property submission for Linn County Barns can provide the framework for registering barns in Linn County. National Register placement entails property owner agreement. Thus far, twenty-five property owners of eligible barns were contacted to see if they would be interested in National Register nominations for their barns. Eight of the twenty-five owners contacted gave their consent to have the county prepare National Register registration forms.

Public Education

Although barns are viewed with sentimentality and nostalgia by many non-agrarian members of our society, a deeper understanding of barns as communicators of cultural information is lacking. There are several mediums through which the public can gain a more profound insight, and presumably a deeper appreciation, of barns.

In the early 1990s, a barn tour was one of the events hosted by the Scio Lamb and Wool Fair in Linn County. The event was well-attended providing an opportunity for the public to see barn interiors. While interior tours of barns can be difficult, because of liability concerns stemming from the dangers inherent in many barns, special tours of this type, organized by the people within a community for a community event, are a wonderful opportunity for the public to learn about barns. More difficult, perhaps, are tours for profit. In Linn County, heritage tours are currently offered by a private company which has included barns on their tour itinere in the past. For farmers willing to allow the organized tour group into their barn, this can be a source of income to help with the upkeep and maintenance of the building.

The one regret of the 1996 survey effort was the absence of the video camera which could have recorded the experience in a way not captured on photographs and in words. With the

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knowledge provided by the survey, a documentary on barn building in Linn County would perhaps be a most effective agent for stimulating appreciation and fostering preservation. The cost of this type of venture, however, is probably prohibitive for the county even with a matching preservation fund grant. A production of this type could be achieved, however, by partnerships with other Linn County groups, organizations and agencies interested in history, agriculture and barns.

A brochure describing historic Linn County barn types, perhaps combined with a driving tour, could be produced relatively inexpensively. It is recommended that permission from the property owner be secured before including their site on a driving tour. The brochure needs to emphasize that the property is only to be viewed from the road.

The Update, a monthly newspaper published by the Linn County Extension Association, may provide the forum for a monthly article on various aspects of barns. Individual barns could be showcased, a kind of "Barn of the Month", or there could be articles on barn repair and maintenance.

Barn Again! is a program developed by Successful Farming Magazine and the National Trust for Historic Preservation. The program promotes the preservation and practical use of older barns. Among the program's activities are an annual award for excellence in barn rehabilitation and farm and ranch preservation. Barn Again! also is a source of practical, up-to-date information and technical assistance for barn owners. This information is disseminated by the Barn Again! Hot Line phone, (303-623-1504), and through publications such as *Barn Again! - A Guide to Rehabilitation of Older Farm Buildings* and the *Barn Aid Series* which deals with technical topics such as foundations, painting, and siding repair. Barn Again! has also helped to develop statewide barn preservation programs and provided workshops.

Adaptive Use

"...barns have always served as warehouses, and their vast spaces do not have to be restricted to sheltering animals or hay. The popularity of mini-storage facilities...suggests that barns could be profitably preserved as places to store cars, pleasure boats, snowmobiles or other large or seasonal equipment."⁴

In addition to their obvious use as storage buildings, barns can be converted to dwellings and

⁴ Endersby, Elric, Alexander Greenwood and David Larkin, Barn: The Art of a Working Building, (Boston: Houghton Mifflin Company), 1992, p. 181.

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retail sales facilities. In both cases, building codes and zoning codes may make such uses difficult. Figure 127 illustrates one Linn County barn converted to a residence. While the conversion makes this barn an unlikely candidate for the National Register of Historic Places, similar efforts with less character-altering elements could be eligible. The interior framing of this barn has been retained with the post-to-purlin configuration of the bents working to good advantage in providing a cathedral feeling to the dining room which is located in the former wagon drive. On either side of the drive, the lofts provide second level bedrooms.

Another example of a successful adaptive use of a barn is conversion of the Grell Barn, located on Hwy. 34, to a retail nursery (Figure 128). The business also sells fruits, vegetables, and gifts. The owners wished to retain elements which bespoke of the barn's former uses. Stanchions, mangers and water bowls were retained and fruits and vegetables are displayed in the mangers. The grain bins are used to store surplus inventory and bags of grass seed and feed. One grain bin was converted to a rest room. The horse stalls have been retained and the mangers used to display gift items. The wagon drive is the location of the cash register, and cold storage units.

Funding

The Tax Reform Act of 1986 provides a 20 percent investment tax credit with a full adjustment to basis for rehabilitating historic commercial, industrial, and rental residential buildings. For buildings not listed on the National Register but built prior to 1936, a 10 investment tax credit is available. Information on the tax credit as well as Internal Revenue Service tax form 3468 Investment Credit, was given to property owners we spoke to during the 1996 barn survey.

Oregon State law authorizes a tax benefit for properties listed on the National Register including contributing properties in National Register districts. Owners may apply to "freeze" the assessed value of the property within the National Register boundary for a 15-year period. The program is designed as an incentive to owners to implement an approved preservation plan. The owner must also hold a public open house each year, display an identifying plaque, and obtain approval of a written rehabilitation proposal. These requirements are only for properties which wish to have the special assessment and are not a condition of National Register placement.

Owners of properties on the National Register are also eligible to compete for matching grants-in-aid on a reimbursement basis when such grants are available. These grants are administered by the State on behalf of the National Park Service, U.S. Department of the Interior. Given the available money each year, and the number of applicants, this is probably not a reliable source of funding for private property owners.

The Farm Service Agency has loans available to qualified farmers who cannot obtain loans elsewhere. Direct Operating Loans allow up to \$15,000 to be used for real estate improvements.

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The Linn County Historic Resource Commission has suggested the establishment of a revolving loan fund dedicated to barn rehabilitation.

HABS recordation

There are a number of barns which should be recorded according to Historic American Building Survey standards. Candidates include the pioneer era timber frame barns, especially those that are threatened by their condition, and barns exhibiting interesting timber framing.

Relocation

As a last resort, significant barns which are threatened by demolition either by neglect or purposeful action should be moved. Timber-frame barns can be recorded, disassembled, and reconstructed on a new site.

SUGGESTED FUTURE STUDIES AND BIBLIOGRAPHY

Contextual Studies

There are several related contextual studies which are critical if we are to locate and protect properties associated with these important events in Linn County history. These contexts will also provide additional information leading to the identification of significant barns. The completion of these contexts at this time is critical because many individuals able to provide information are elderly. Suggested contexts are as follows:

Historic context on German Catholic settlement in Linn County's Jordan Valley.

Historic context on Czech settlement in Linn County.

Historic context on Mennonite settlement in Linn County.

Historic context on dairying in Linn County.

Historic context on the development of the grass seed industry in Linn County.

Historic context on wheat production in Linn County in the 19th century.

Surveys

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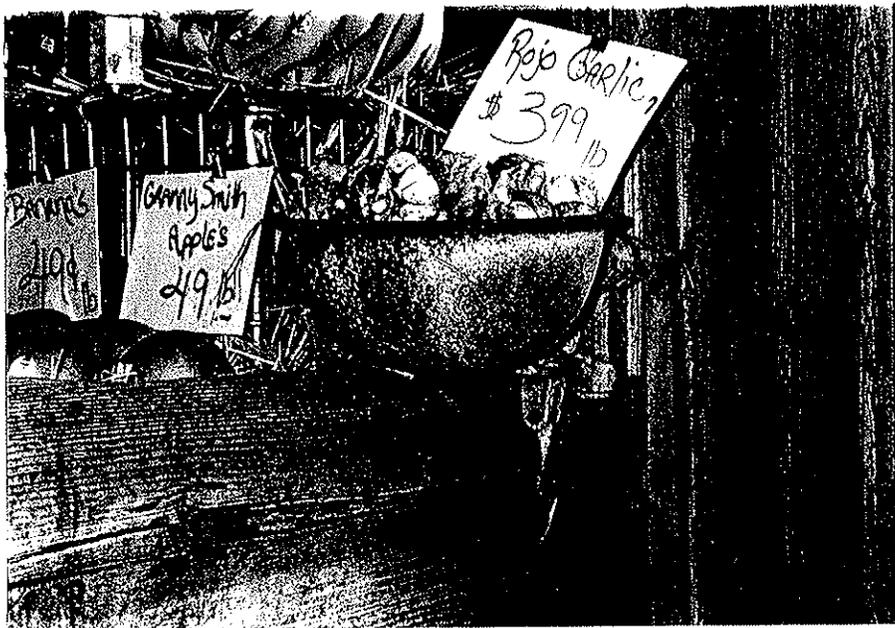
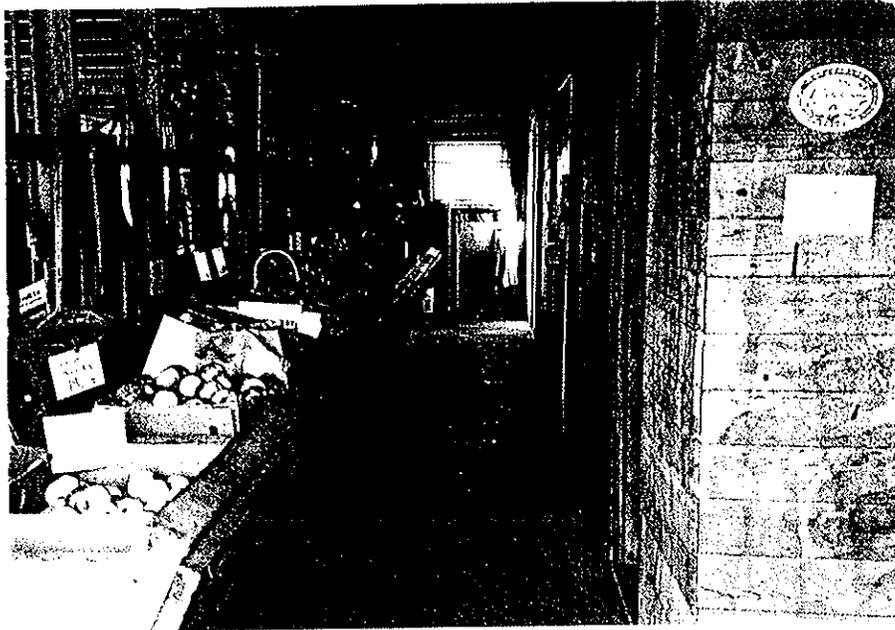
During the 1996 survey, a list was compiled of barns that warranted further investigation. An intensive level survey of these barns should be completed. The 1996 survey did not extend very far into the Cascade foothills. A survey of this region should also be accomplished. Of special interest is the Holly and Sweet Home vicinities.



Figure 127. Linn County barn that has been converted to a residence.

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Figure 128. The Grell Barn built in 1929 and currently used as a retail nursery and produce stand.



BIBLIOGRAPHY

BIBLIOGRAPHY

- Allen, Lewis. Rural Architecture. New York: Saxton, 1852.
- Anon. Farm Buildings. Chicago: Sanders Publishing Co., 1907.
- Arthur, Eric and Dudley Witney. The Barn: A Vanishing Landmark in North America. Greenwich, Connecticut: New York Graphic Society Limited, 1972.
- Auer, Michael. "The Preservation of Historic Barns," Preservation Brief No. 20, U.S. Dept. of the Interior, National Park Service, Preservation Assistance Division, October, 1989.
- Barre, H.J. and L.L. Sammett. Farm Structures. New York: John Wiley & Sons, Inc., 1950.
- "Barrett Bros." Albany Democrat Herald. Albany, Oregon, Friday, March 26, 1993, pp. 36-38.
- Bates, Carol. Scio in the Forks of the Santiam. Gates, Oregon: Susan Gauderman, Gates Graphics, 1989.
- Bentz, Barbara, Linda Duman and Father Gregory Moys. Centennial History, 1885-1985, Our Lady of Lourdes. North Santiam Newspapers, 1985.
- "Berlin Stock Ranches Important Factors in Linn County Economy," The Lebanon Express, March 30, 1954.
- Boag, Peter Guy. The Calapooian Matrix: Landscape and Experience on a Western Frontier. Doctoral Dissertation, University of Oregon, Eugene, Oregon, 1988.
- Breithaupt, L. R. and M.D. Thomas and C.J. Borum. "Production and Income Statistics for Certain Specialty Farm Products Oregon 1936." Corvallis, Oregon: Oregon Agricultural College Extension Service, Extension Circular No. 318, Sept. 1936.
- Bryant, Zachariah T., "An Unpublished Autobiography of a Carpenter/Builder and Civil War Soldier." Written and Transcribed in 1935.
- Buchner, Ward, ed. Dictionary of Building Preservation. New York: Preservation Press, John Wiley and Sons, Inc., 1996.
- Butterfield, Kenyon L. Chapters in Rural Progress. Chicago, Illinois: The University of Chicago Press, 1913.
- Calkins, Charles and Martin Perkins. "The Three-Bay Threshing Barn." Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press,

BIBLIOGRAPHY

1995, pp. 40-61.

Capek, Thomas. The Cechs (Bohemians) in America. Boston: Houghton Mifflin Company, 1920.

Carey, Charles. History of Oregon. Portland, Oregon: The Pioneer Historical Publishing Company, 1922.

Carey, Margaret Standish and Patricia Hoy Hainline. Sweet Home in the Oregon Cascades. Brownsville, Oregon: Calapooia Publications, 1979.

Cavert, William L. "The Technological Revolution in Agriculture, 1910-1955." Agricultural History, 30(1), 1956, pp. 18-27.

Corning, Howard, McKinley. Willamette Landings "Ghost Towns of the River". Portland: Oregon Historical Society, Binford and Mort, 1947.

Cranfills, Jasper N. "Diary of Jasper N. Cranfills." Manuscript in the Oregon Collection, Knight Library, University of Oregon, 1865-66.

Dandekar, Hemalata C. and Eric Allen MacDonald. "Preserving the Midwestern Barn." Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press, 1995, pp. 259-277.

Deane, Samuel. The New England Farmer. Boston: Wells and Lilly, 1822.

"Demand for Country Club Milk is Good." Scio Tribune, May 13, 1915, p. 1.

Doane Agricultural Service. The Farm Book: A Guide to Better Farming with Better Buildings. West Coast Woods, Portland, Oregon, 1947.

Dole, Philip. "Farmhouse and Barn in Early Lane County." Lane County Historian. Eugene, Oregon: Lane County Pioneer-Historical Printing Society, Vol. 10, no. 2, Aug., 1965, pp. 22-43.

Dole, Philip. "Farmhouses and Barns of the Willamette Valley," in Space, Style, and Structure: Building in Northwest America, Ed. Thomas Vaughan and Virginia Guest Ferriday. Portland, Oregon: Oregon Historical Society, 1974, pp.78-129.

Dole, Philip. "Farmhouses and Barns of the Willamette Valley," in Space, Style, and Structure: Building in Northwest America, Ed. Thomas Vaughan and Virginia Guest Ferriday. Portland, Oregon: Oregon Historical Society, 1974, pp.209-240.

BIBLIOGRAPHY

- Ekblaw, K.J.T. Farm Structures. New York: Macmillan Company, 1914.
- Endersby, Elric, Alexander Greenwood and David Larkin. Barn: The Art of a Working Building. Boston: Houghton Mifflin Company, 1992.
- Ensminger, Robert F. The Pennsylvania Barn: Its Origin, Evolution, and Distribution in North America. Baltimore and London: The John Hopkins University Press, 1992.
- Federal Cooperative Extension Service. Oregon's Farm Products for Market 1936-1940. Corvallis, Oregon: Oregon State College Extension Service, Extension Bulletin 641, Sept. 1944.
- Federal Cooperative Extension Service. "Producing Clean Milk." Corvallis, Oregon: Oregon State College, Extension Service Bulletin 630, Jan. 1944, revised 1947.
- Fitchen, John. The New World Dutch Barn. Syracuse, N.Y.:Syracuse University Press, 1968.
- Foster, W.A. and Deane G. Carter. Farm Buildings. New York: John Wiley and Sons, 1922.
- Francaviglia, Richard V. "Western American Barns: Architectural Form and Climatic Considerations." Yearbook of the Association of Pacific Coast Geographers, Ed. John F. Gaines. Corvallis, Oregon: Oregon State University Press, Vol. 34, 1972, pp.153-160.
- Frazer, W.J. "Best Farm Buildings." Harrisburg Commonwealth. Harrisburg, Oregon, Friday, May 21, 1915, p. 3.
- Gerig, Irvin. "History of the Fairview Mennonite Church." OMHGS Newsletter, Vol. 2, Number 1, February, 1989.
- Gillin, John Lewis. The Dunkers: A Sociological Interpretation. New York: Columbia University, 1906.
- Gray, Harold E. Farm Service Buildings. New York: McGraw-Hill Book Company, 1955.
- Halbakken, David. A History of Wheat Growing in Oregon During the Nineteenth Century. Eugene, Oregon: M.A. Thesis, University of Oregon, 1948.
- Halsted, Byron D. Barns, Shed and Outbuildings. Brattleboro, Vermont: The Stephen Greene Press, 1977. (Reprint of 1881 edition originally published by O. Judd Co.)
- Harney, George E. Stables, Outbuildings, and Fences. New York: The American News Company, 1870.

BIBLIOGRAPHY

- Haskin, Leslie L., et. al.. "Interview with Catherine Louise McHargue Hume," in Pioneer Stories of Linn County, Oregon, Vol. II. Albany, Oregon: Linn Benton Genealogical Services, 1984.
- Haskin, Leslie, L., et. al., "Interview with Dorissa Jane Zoosman Miller," in Pioneer Stories of Linn County, Oregon, Vol. III. Albany, Oregon, Linn Benton Genealogical Services, 1985.
- Haskin, Leslie L. et al. Linn County, Oregon Pioneer Settlers: Their Fir Wood Churches & Church Histories. Albany, Oregon:Richard P. Milligan, 1983.
- Harper, Glenn A. and Steve Gordon. "The Modern Midwestern Barn, 1900-Present." Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press, 1995, pp. 213-232.
- Hayden, Pam. Clackamas County, Our Agrarian Past: Historic Barns and Farm Outbuildings. Clackamas County, 1992.
- Hill, D.D. Oats Production in Western Oregon. (Corvallis, Oregon: Oregon State Agricultural College, Agricultural Experiment Station, Station Bulletin 285, June 1931.
- Hopkins, Alfred. Modern Farm Buildings. New York: McBride, Nast & Company, 1913.
- Hubka, Thomas C. Big House, Little House, Back House, Barn: The Connected Farm Buildings of New England. Hanover: University Press of New England, 1984.
- Humestone, Mary. Barn Again! A Guide to the Rehabilitation of Older Farm Buildings. Des Moines, Iowa: Meredith Corporation and the National Trust for Historic Preservation, 1988.
- Hunt, Helm, Ferris & Co. The Star Line. Harvard, Illinois: Hunt, Helm, Ferris, & Co., 1921 edition.
- Hurt, R. Douglas. American Farm Tools. Manhattan, Kansas: Sunflower University Press, 1982.
- "It Used to be...but now...": An Oral History of Lebanon, Oregon and Surrounding Areas, Dalton's Printing: Lebanon, Oregon, 1978.
- James Manufacturing Co. Better Barns: The Seven Essentials of a Satisfactory Dairy Barn. James Manufacturing Co., 1922.
- Jamison, N.C. "Dairy Cattle Feeding With Some Pointers on Management." Corvallis, Oregon:

BIBLIOGRAPHY

- Oregon Agricultural College Extension Service, Extension Bulletin 402, March 1928.
- Johnson, Dave, Letter to Patricia Dunn, September 5, 1996.
- Johnson, Dexter W. Using Old Farm Buildings. National Trust for Historic Preservation, Forum Information Series, No. 46, 1989.
- Judge, Barbara C. Historic Farm Structures as Material Culture: an Oregon Study. Master's Thesis, Oregon State University, 1993.
- Kent, F.L. "1. Iron Cow Stall, 2. Hoard Schulmerich Stall." Corvallis, Oregon: Oregon Agricultural Experiment Station, Department of Dairy Husbandry, Oregon Agricultural College, Circular Bulletin No. 9, March 1910.
- Kent, F.L. "Creameries and Cheese Factories of Western Oregon." Corvallis, Oregon: Oregon Agricultural Experiment Station, Bulletin No. 65, January. 1901.
- Kirk, Malcolm. Silent Spaces: The Last of the Great Aisled Barns. Boston: Little, Brown and Company, 1994.
- Klamkin, Charles. Barns: Their History, Preservation, and Restoration. New York: Hawthorn Books, 1973.
- Klock, H.L. "Improving the Condition of the Dairy Farm." Report of the 1909 Dairy Convention. (Oregon State University Archives.)
- Lind, Hope Kauffman. Apart and Together: Mennonites in Oregon and Neighboring States 1876-1976. (Scottsdale, Pennsylvania: Herald Press), 1990.
- Linn County Oregon, Articles of Incorporation, Volume 2.
- "Local Dairymen are Showing Big Interest." The Brownsville Times, July 25, 1929, p.1.
- Louden Machinery Company. Louden Barn Equipment. Fairfield, Iowa: Loudon Machinery Company, 1916.
- Louden Machinery Company. Louden Barn Plans. Fairfield, Iowa: Loudon Machinery Company, 1914.
- Malboeuf, C.A. "The Railroad's Part in the Dairy Industry." Report of the 1909 Dairy Convention, on file Oregon State University Archives.
- "Many Acres of Rye in This Neighborhood," The Harrisburg Bulletin, Harrisburg, Oregon,

BIBLIOGRAPHY

- May 1, 1924, p. 1.
- Martin, George (ed.). Farm Appliances: A Practical Manual. New York: Orange Judd Company, 1907.
- McCoy, J. Fred. "A Biography of John McCoy with a Brief History of Linn County, Oregon." Albany, Oregon: Richard R. Milligan, March 1983.
- Mullen, Floyd C. The Land of Linn. Lebanon, Oregon: Dalton's Printing, 1971.
- Nash, L. Andrew. "The American Timber Frame." Timber Framing, No. 37, Sept. 1995, pp. 10-11.
- Nelson, Herbert B. "The Vanishing Hop-Driers of the Willamette Valley." Oregon Historical Quarterly, Vol. 64, September 1963.
- Nelson, Lee H. Nail Chronology As An Aid to Dating Old Buildings. History News, Vol. 24, No. 11, Association for State and Local History, Technical Leaflet 48, Nov. 1968.
- Noble, Allen G. "The Evolution of American Farm Silos." Journal of Cultural Geography, Vol. 1, no. 1 (1980).
- Noble, Allen G. (ed.) To Build in a New Land: Ethnic Landscapes in North America. Baltimore: The John Hopkins University Press, 1992.
- Noble, Allen G. and Richard K. Cleek. The Old Barn Book: A Field Guide to North American Barns and Other Farm Structures. New Brunswick, New Jersey: Rutgers University Press, 1995.
- Noble, Allen G. Wood, Brick and Stone: The North American Settlement Landscape. Volume 2: Barns and Farm Structures. Amherst: The University of Massachusetts Press, 1984.
- Noble, Allen G. and Hubert G.H. Wilhelm. Barns of the Midwest. Athens, Ohio: Ohio University Press, 1995.
- "Nygren dairy," Albany Democrat Herald, Friday, March 26, 1993, pp. 45-46.
- Olsen, Charles Olaf. History of Linn County, Oregon. Work Projects Administration Writer's Program, Reprinted by L.M. Wheeler, 1982.
- Olsen, Michael Leon. "History of the Livestock Industry in the Pacific Northwest." Oregon Historical Quarterly. Vol. 49, 1948, pp. 1-29.

BIBLIOGRAPHY

- Olsen, Michael Leon. The Beginning of Agriculture in Western Oregon and Western Washington. Seattle, Washington: Doctoral Dissertation, University of Washington, 1970.
- Olsen, Michael Leon. "Thomas S. Kendall's Letter on Oregon Agriculture, 1852." Agricultural History. Vol. 9, 1935, pp. 187-197.
- "On the Farm." Albany Democrat Herald. Albany, Oregon, Friday, March 26, 1993, pp.33-35.
- Orange Judd Company. Barn Plans and Outbuildings. New York: Orange Judd Company, 1907.
- Oregon Agricultural Experiment Station. 100 Years of Progress: The Oregon Agricultural Experiment Station Oregon State University 1888-1988. Corvallis, Oregon: Oregon Agricultural Experiment Station, College of Agricultural Sciences, Oregon State University, 1990.
- Oregon Dairymen's Association, Report of the Annual Convention, Dec. 1907
- Oregon State College Department of Agricultural Engineering. "Oregon State College Farm Building Plan Service." Corvallis, Oregon: Oregon State College Extension Service, Extension Circular No. 376, September, 1941.
- Parrish, Alma H. "Silos Once Dotted Landscape In Sodaville Farming Region." The Lebanon Express, Mon. Feb. 17, 1958.
- Pirtle, T.R. History of the Dairy Industry. Chicago: Mojonnier Bros. Company, 1926. (Reprinted 1973, Scholarly Resources, Inc.)
- Powell Lumber Sales Account Book 1857-1871, Powell Family Papers, Manuscript Collection of the Oregon Collection, Knight Library, University of Oregon, Eugene, Oregon.
- Portland Cement Association. Concrete on the Dairy Farm. Portland Cement Association, n.d.
- Price , F.E., A.W. Oliver, and E.L. Potter. "Electric Hay Hoists." Corvallis, Oregon: Oregon State College, Agricultural Experiment Station, Station Bulletin 255, Sept. 1929.
- Radford, William A. Framing. Chicago, Illinois: The Radford Architectural Company, 1909.
- Radford, William, A. Radford's Practical Barn Plans. Chicago, Illinois: The Radford Architectural Co., 1909.
- Rau, John E. "Czechs in South Dakota." To Build in a New Land: Ethnic Landscapes in North America. Baltimore: The John Hopkins University Press, 1992, pp. 285-306.

BIBLIOGRAPHY

- Rawson, Richard. Old Barn Plans. New York: Bonanza Books, 1982.
- Rhude, Andreas Jordahl. "Structural Glued Laminated Timber: History of its Origins and Early Development." Forest Products Journal, Vol. 46, No. 1., January, 1996.
- Rikoon, J. Sanford. Threshing in the Midwest, 1820-1940. Bloomington, Indiana: Indiana University Press, 1988.
- Roberts, H. Armstrong. The Farmer His Own Builder. Philadelphia: David McKay, 1918.
- Roberts, Isaac Phillips. The Farmstead. New York: The Macmillan Company, 1910.
- Roberts, Phyllis Pugh and Harvey G. Pugh, et al. Francis Asbury Pugh and Ruth Jessup Pugh Pioneers of 1846 in the Oregon Country. Portland, Oregon: J.V. Hollingsworth Co., 1959.
- Roberts, Warren E. "Early Log-Crib Barn Survivals". Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press, 1995, pp. 24-39.
- Rueber, Bruce Edmond. Factors Influencing Barn Styles in Fayette, County, Iowa. San Diego: San Diego State University, Master's Thesis, 1974.
- Schaffhausen, J.F. 1939. "Trends in One-story Barn Construction." Agricultural Engineering, 20 (December):467-68.
- Shanks, Luther R. "I'll be Jumped Up." Unpublished Manuscript, ca. 1982.
- Schuler, Stanley. American Barns: In a Class by Themselves. Exton, Pennsylvania: Schiffer Publishing Co., 1984.
- Scudder, H.D. and E.B. Hurd. "Graphic Summary of Agriculture and Land Use in Oregon," Corvallis, Oregon: Oregon Agricultural Experiment Station, Circular #114, December 1935, p. 26.
- Sculle, Kieth A. and H. Wayne Price. "Barns of Nonorthogonal Plan." Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press, 1995, pp. 188-212.
- Schultz, LeRoy. Barns, Stables and Outbuildings: A World Bibliography in English, 1700-1983. Jefferson, North Carolina, and London: McFarland & Company, Inc., 1986.
- Sculle, Keith A. and H. Wayne Price. "Barns of Nonorthogonal Plan." Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press,

BIBLIOGRAPHY

- 1995, pp. 188-212.
- Seymour, E.L.D. (ed.) Farm Knowledge Vol. III: Farm Implements and Construction. New York: Doubleday, Page & Company for Sears, Roebuck and Co., 1919.
- Shannon, Fred A. The Farmer's Last Frontier: Agriculture 1860-1897. New York: Farrar & Rinehart, Inc., Volume V, The Economic History of the United States, 1945.
- Shearer, Herbert A. Farm Buildings with Plans and Descriptions. Chicago: Frederick J. Drake & Co., 1917.
- Shoemaker, Alfred, et. al. The Pennsylvania Barn. Lancaster, Pennsylvania: The Pennsylvania Dutch Folklore Center, Inc. 1955.
- "Short Course in Horticulture and Dairying." Corvallis, Oregon: Oregon Agricultural Experiment Station, Station Circular No. 2, Nov. 1, 1897.
- Sitton, G.R. "Evolution of Public Regulation of the Market Milk Industry in Oregon." (Corvallis, Oregon: Oregon State College, Agricultural Experiment Station, Circular of Information No. 252, December 3, 1941.
- Sloane, Eric. American Barns and Covered Bridges. New York: Funk and Wagnalls, 1954.
- Slone, Eric. An Age of Barns. New York: Funk and Wagnalls, ?.
- Smith, C. Henry. The Story of the Mennonites. Fourth Edition, Newton, Kansas: Mennonite Publication Office, 1957.
- Sobon, Jack and Roger Schroeder. Timber Frame Construction. Pownal, Vermont: Garden Way Publishing, 1984.
- Soike, Lowell J. "Affordable Barns for the Midwest: Beginnings." Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press, 1995, pp. 80-98.
- Soike, Lowell J. "Within Reach of All: Midwest Barns Perfected." Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press, 1995, pp. 147-166.
- Soike, Lowell J. Without Right Angles: The Round Barns of Iowa. Iowa State Historical Department, Office of Historic Preservation, 1983.
- Speulda, Lou Ann. Oregon's Agricultural Development: A Historic Context 1811-1940. Salem,

BIBLIOGRAPHY

Oregon:State Historic Preservation Office, 1989.

Steinbacher, Martha. In the Beginning... Sweet Home, Oregon: Tell and Sell/Sweet Home Printing, 1979.

Stewart, C.H., *The Earl Family of Linn County*, in Leslie L. Haskin Collection, W.P.A. Records, Brownsville Public Library, Vol. 13.

The Brethren Encyclopedia. 3 Vols. Philadelphia: Brethren Encyclopedia, 1984.

The Brownsville Times, May 30, 1929, p. 1.

The County Gentleman, Jan. 10, 1914.

The Loudon Machinery Company. Loudon Farm Building Hardware and Equipment. Fairfield, Iowa: The Loudon Machinery Company 1946.

The Mennonite Encyclopedia. Scottdale, Pennsylvania: Mennonite Publishing House, Second Printing, 1972.

The Scio Tribune, April 8, 1915, p.4.

The Scio Tribune, April 15, 1915, p.4.

The Scio Tribune, May 13, 1915, p.4.

The Scio Tribune, July 15, 1915, p.4.

The Scio Tribune, July 15, 1915, p.4.

The Willamette Farmer, May 14, 1870.

Thomas, J.J. Rural Affairs, Vol. II. Albany, New York: Luther Tucker & Son, 1889. (Reprint of Rural Affairs for 1858-1859-1860.)

Thomas, J.J. Rural Affairs, Vol. III. Albany, New York: Luther Tucker & Son, 1889. (Reprint of Rural Affairs for 1861-1862-1863.)

Thomas, J.J. Rural Affairs, Vol. VI. Albany, New York: Luther Tucker & Son, 1889. (Reprint of Rural Affairs for 1864-1865-1866.)

Thomas, J.J. Rural Affairs, Vol. V. Albany, New York: Luther Tucker & Son, 1889. (Reprint of Rural Affairs for 1867-1868-1869.)

BIBLIOGRAPHY

- Thomas, J.J. Rural Affairs, Vol. VI. Albany, New York: Luther Tucker & Son, 1889. (Reprint of Rural Affairs for 1870-1871-1872.)
- Thomas, J.J. Rural Affairs, Vol. VII. Albany, New York: Luther Tucker & Son, 1889. (Reprint of Rural Affairs for 1873-1874-1875.)
- Thomas, J.J. Rural Affairs, Vol. VIII. Albany, New York: Luther Tucker & Son, 1878. (Reprint of Rural Affairs for 1876-1877-1878.)
- Thomas, J.J. Rural Affairs, Vol. IX. Albany, New York: Luther Tucker & Son, 1881. (Reprint of Rural Affairs for 1879-1880-1881.)
- Thomas M.D., and Breithaupt, L. R. and N. I. Nielsen. "Production and Income Statistics for Specialty Farm Products Oregon 1938." Corvallis, Oregon: Oregon Agricultural College Extension Service, Extension Circular No. 334, July, 1939.
- Thomas M.D., and Breithaupt, L. R. and N. I. Nielsen. "Production and Income Statistics for Specialty Farm Products Oregon 1938." Corvallis, Oregon: Oregon Agricultural College Extension Service, Extension Circular No. 375, August 1941.
- "Tolstoj Lodge Plays Active Part in Richardson Gap History." Lebanon Express, Friday, November 1, 1968.
- United States Census Records, Linn County, Oregon, Schedule 5, Products of Industry, 1850.
- Vogeler, Ingolf. "Dairying and Dairy Barns in the Northern Midwest." Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press, 1995, pp. 99-124.
- "Western Oregon is Now Major Alfalfa Section." The Brownsville Times, July 25, 1929, p. 2.
- White, F.M. Dairy and General Purpose Barns. Chicago: National Lumber Manufacturers Association, Farm Bulletin No. 7, January, 1917.
- Wik, Reynold. Steam Power on the American Farm, 1953.
- Wilhelm, Hubert G.H. "Midwestern Barns and Their Germanic Connections." Barns of the Midwest. Ed. Allen G. Noble and Hubert G.H. Wilhelm, Athens, Ohio: Ohio University Press, 1995, pp. 62-79.
- Williams, Edgar. Historical Atlas Map Marion and Linn Counties Oregon. San Francisco, California: Edgar Williams & Co., 1878. (Original reprinted by the Marion County Historical Society and the Friends of Historic Albany in 1976 and 1981.)

BIBLIOGRAPHY

- Williams, Robert C. Fordson, Farmall, and Poppin' Johnny: A History of the Farm Tractor and Its Impact on America. Urbana and Chicago: University of Illinois Press, 1987.
- Withycombe, J. "The Silo and Silage." (Corvallis, Oregon: Oregon Agricultural Experiment Station), Bulletin No. 67, June, 1901.
- Wooley, J.C. Farm Buildings. Columbia, Missouri: The University Co-Operative Store, 1936.
- Wooley, J.C. Farm Buildings. New York: McGraw-Hill Book Company, Inc., 1946.
- Wooley, J.C. Repairing and Constructing Farm Buildings. New York: McGraw-Hill Book Company, Inc., 1952.
- Young, F.G. Oregon's First Century of Farming: A Statistical Record of Agricultural Achievement and Adjustment. Corvallis, Oregon: Oregon State College, Federal Cooperative Extension Service, 1959.
- "ZCJB Halls: reminders of Czechoslovakian settlers," The Lebanon Express, Mar. 31, 1977.

APPENDIX A

DEFINITIONS

The definitions in this section are in reference to barns. Some of these terms have other meanings that are not provided below.

Balloon Frame -- Outside wall frame made of studding, extending from sill to plate. Composed of lightweight sawn members joined by nails.

Bank Barn -- A two-level barn whose upper level is entered from a bank or hillside. against the barn.

Barn -- A building for storing farm produce and/or stabling livestock. Its origins in England refer more to the first function. The word is derived from a combination of two Anglo Saxon words, *bere*, meaning barley (or subsequently any grain), and *ern*, meaning place of storage.¹

Barn Yard -- "A small piece of inclosed [sic] ground contiguous to a barn in which cattle are usually kept."²

Batten -- A narrow strip used to cover the crack between siding boards. The cross member of a batten door.

Bay -- Area of a barn, physically defined and used for specific functions. "Each individual space defined by a structural grid; includes, for example, the spaces between the bents of a timber frame barn..."³

Beam -- A structural member to carry a load applied at right angles to its length.

Bent -- Heavy timber framework section of a barn's superstructure which is connected to similar sections to complete the barn frame.

Bent Configuration -- Pattern produced by posts, tie beams, and braces.

Birdsmouth -- A seat-cut notch at the bottom of a rafter.

Bolster -- A horizontal timber set across the top of a column to support the parallel ends of girders above it.⁴

Box Stall -- An enclosure large enough to allow an animal to move about inside. Also known as a loose stall.⁵

Brace -- A structural member set at a 45-degree angle between vertical posts and horizontal beams. Its purpose is to stiffen the frame.

Braced Rafter -- A gambrel rafter built up by bracing across the angle between the upper and lower sections.

¹ Morris, William (ed), *The American Heritage Dictionary of the English Language*, (Boston: Houghton Mifflin Company, 1969), p. 108.

² Deane, Samuel, *The New England Farmer*, (Boston: Wells and Lilly), 1822, p. 275.

³ Bucher, Ward (ed.), *Dictionary of Building Preservation*, (New York: Preservation Press, John Wiley and Sons, Inc.), 1996.

⁴ Bucher, p. 56.

⁵ Bucher, p. 277.

APPENDIX A

Breast girt -- A breast-high horizontal member that spans between the end-posts and the center post of a bent adjoining the center space of a timber frame barn; supported by breast studs; used to keep hay out of the interior driveway.⁶ Also referred to as a mow wall or a mowstead.

Breast stud -- A stud that supports a breast girt.

Collar Beam -- The horizontal member that connects and stiffens opposing rafters.

Cupola -- Small, towerlike structure on roof providing additional light and ventilation.

Double-decker Barn -- Bank barn with three levels.

Ell -- A building appendage which creates an L-shaped plan.

End girt -- A wood girt that spans between the middle of the center post and the corner posts of the end bent.⁷

End-post -- Heavy outer post of a bent.

Farmstead -- Farm buildings and house as a group.

Gambrel -- A roof with a double slope; the lower one steeper than the upper.

Girder -- A solid or built-up structural member designed to carry the joists and thus the loads applied to them.

Girt -- Horizontal framing member of the bent connecting the end posts generally below roof plate. Often referred to as the tie beam in a bent.

Gothic Rafters -- Laminated rafters, bent or sawn, with a convex profile.

Hay Doorway -- A large opening for the hay fork located in the gable of a barn.

Hay Hood -- The roof projection built out over the hay door to protect the hay track extension.

Hay Hole -- Opening in hayloft floor through which hay and straw are lowered to the stable below.

Hayloft -- The open, upper level of a barn used to store hay.⁸

Haymow -- A large space within a barn used for storing a mow of hay. Also known as a hay room.⁹

Joints -- connections between timbers coming together at an angle.

⁶ Bucher, p. 64.

⁷ Bucher, p. 166.

⁸ Bucher, p. 227.

⁹ Bucher, p. 227.

APPENDIX A

Joists -- Horizontal structural members designed to support floors or overhead ceilings.

Lookout -- The projecting end of the rafter, or short pieces to frame the eaves or the overhang of the roof.

Louver -- A rainproof opening of slats to provide for the circulation of air.

Manger -- Trough for food for livestock.

Mortise and tenon -- An ancient method of all wood joinery by which a projecting member is inserted into a cut-out hole and held together by a wooden dowel called a treenail, a pin, or a peg.

Mortise -- In a mortise and tenon joint, the slot or hole cut into one member, into which is inserted in the tenon from another member.

Mows -- Spaces in the barn reserved for hay, grain in the sheath, and straw storage.

One and a half story barn -- A one and one-half story barn has side walls above the first story no more than six feet high. Or, in the case of a barn with a gambrel roof, the lower rafters may come just over the floor joists of the loft.

Plate -- A horizontal structural member resting on the studding or posts and supporting the lower ends of the rafters.

Post -- A vertical structural member, usually placed at intervals of 10 -15 feet.

Principal rafter -- Heavy rafter which is larger at the bent than common rafters are between bents.

Purlin plate -- A roof beam intermediate between the plate and the ridge, supporting the rafters.

Purlin post -- One of a pair of vertical or canted posts which rest on the tie beam of a bent and support the purlin plate.

Rafters -- Structural members extending from plate to ridge, supporting the roof.

Ridge Board -- Board connecting rafter ends at peak of gable.

Scantling -- Small dimension lumber.

Side girt -- A wood girt that spans between the end-posts on the long side of a timber frame barn. ¹⁰

Sill -- Frame member resting on foundation and supporting the outer wall frame.

Splices -- connections in which the members extend in the same direction often to provide great length. The joint which connects the members is a scarf joint.

Stall -- A pen for an individual horse or cow typically 4-5 feet wide and 9 feet deep with partitions at least three

¹⁰ Bucher, p. 422.

APPENDIX A

sides.¹¹

Stanchion -- neckpiece which holds a cow during milking.

Straw -- Stalks of threshed grain.

Tenon -- In mortise and tenon joints, the short shaft projecting from one member which is fitted into mortise in other joint member.

Threshing floor -- A wide floor area in the barn, often the space between mows, on which grains were threshed to separate the grain from the straw.

Tie beam -- Uppermost cross beam, which connects the end posts of the bent.

Timber -- A straight stick of wood larger than four inches square.

Toenailing -- driving nails at an angle into the side of one piece, near enough to the end so they will extend through into a second member at right angles to it.

Truss -- Triangular arrangement of beams, braces, and ties to form a rigid framework.

Two story barn -- In a two-story barn, the side walls are from 8 to 18 feet above the first story floor.

¹¹ Bucher, p. 447.

APPENDIX B: Some Linn County barn builders.

Walt Watson -- Halsey and Harrisburg areas in the 20th century. A barn which he built is located at 32270-80 Highway 99E. Mr. Watson also built the Smucker Barn (Figure 119).

Mike Balkovich -- Harrisburg area in the early 20th century. Mr. Balkovich was of Czech descent.

Bill Watson -- Crabtree-Scio area. A barn that he built is located at 37232 Hwy. 226.

Z.T. Bryant -- Lebanon and Albany areas in the latter part of the 19th century.

Eldon Brush -- Tangent area in the early 20th century

Ira Trexler -- Stayton area

Lulay Brothers -- Stayton area early 20th century

Gustavus P. Milde -- Brownsville area 1920s and 1930s

Tony Schindler -- Stayton and Jordan area in the early 20th century

Herman Holstein -- Albany, Shedd Tangent area in the early 20th century

J.S. Yoder -- Lived near Harrisburg but built in numerous areas of the county. Member of the Mennonite faith.

C.R. Kennel -- Built in the Albany-Lebanon areas in the late 19th and early 20th century. Member of the Mennonite faith.

Thomas Prospal -- Czech builder who built in the Scio area.

APPENDIX C

APPENDIX C: Individuals which may have made a significant contribution in the area of agriculture in Linn County.

Barns associated with these individuals may be significant under Criterion B of the National Register. Further research is required to assess the actual significance of their contributions. This list of individuals is by no means complete.

Brown J. C.: Founding member of the Linn County Cattle Club.

Burkhart, Robert L.: Beginning in 1885, the first to obtain and raise purebred cattle in Linn County. Mr. Burkhart was also a founding member and first chairperson of the Linn County Cattle Club, which promoted the development of the Linn County dairy industry by effecting a community Jersey Breeders Association.

Cochran, William T.: Prominent pioneer stock raiser.

Cook, William: produced first commercial seed for red clover in 1912.

Davidson, C.H.: Pioneer domestic ryegrass grower.

Davis, W.B.: Founding member of the Linn County Cattle Club.

Dickson, J.M.: Founding member of the Linn County Cattle Club.

Felzer, William: Tagent agriculturalist who in 1891 purchased a small amount of ryegrass seed, possibly the first to be planted on a Linn County farm. Mr. Felzer also introduced the Foisey variety of wheat, locally popular.

Hugh Fields: Early livestock producer. In addition to cattle raising, Fields was closely associated with the establishment of the sheep raising industry in eastern Oregon where he earned the title of "Sheep King".

Hulbert, Mark: One of the first to raise purebred cattle beginning in ca. 1890.

Jackson, Thomas: Pioneer domestic ryegrass grower.

Jenks, Forest: Tagent agriculturalist credited with being the first commercial producer of domestic ryegrass seed in the county.

Jenks, Howard: First commercial shipper of domestic ryegrass. Partner in the firm J.E. Jenks and Son.

J.E. Jenks and Son: Credited with opening the eastern U.S. market for domestic ryegrass

APPENDIX C

produced in Linn County.

Kropf, Frank: First to grow perennial ryegrass in Linn County. His success initiated the beginning of perennial ryegrass production in the Willamette Valley.

Macpherson, Hector (Sr.): Legislator of the 1930s who advocated a cabinet form of government in Oregon leading to the establishment of the State Department of Agriculture. Mr. Macpherson also established the Riverwood Dairy and was known for owning one of two Medal of Merit Jerseys in the nation in the early 1920s.

McLagan, Lee: Pioneer ryegrass grower.

Pugh, Harvey: Pioneer domestic ryegrass grower.

Skirvin, Jess: Pioneer domestic ryegrass grower.

Stewart, Henry: Founding member of the Linn County Cattle Club.

Vollstedt, W.A. Operated an early ryegrass seed cleaning plant in Tangent.

Eliza Spalding Warren: Daughter of Henry Harmon Spalding who owned one of the largest flocks of sheep in Linn County in the 19th century. The raising of sheep in this region of the county is associated with the Brownsville Woolen Mills.

Zimmerman, Ed: Cultivated a variety of wheat, eventually known as Zimmerman. This wheat was a popular Linn County variety.

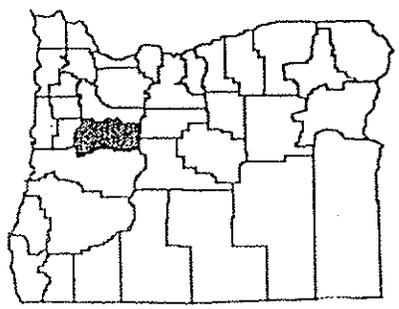
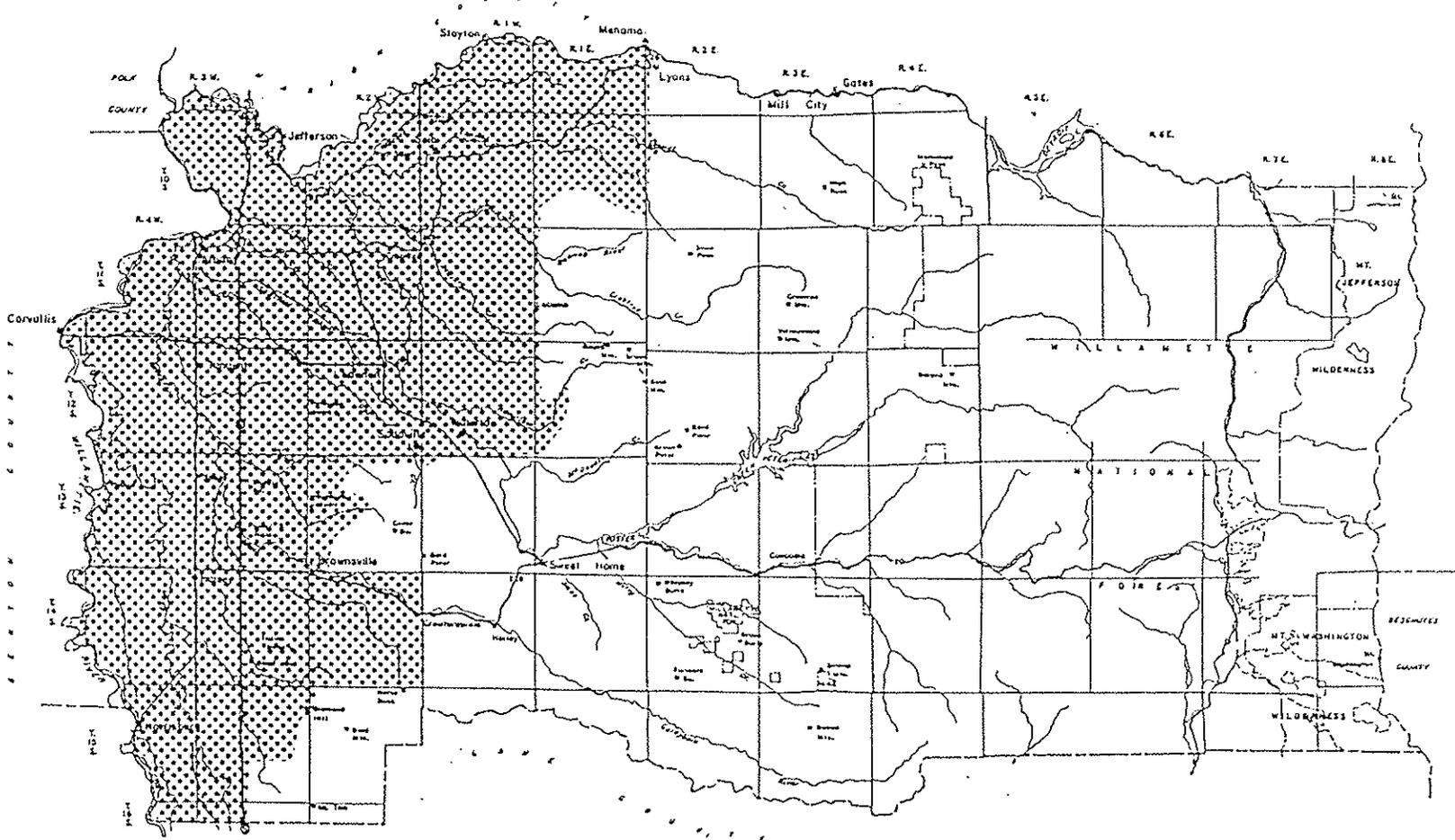


Figure 1: The shaded area is the non-forested, non-federally owned land in Linn County that was surveyed for this project.

BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 2a. Configurations of some swing beam bents observed in Linn County Barns.
Top Left: The Blount Barn; Top Right: The Hugh Leeper Brown Barn, ca. 1850;
Center and Bottom: The Hamilton Barn.

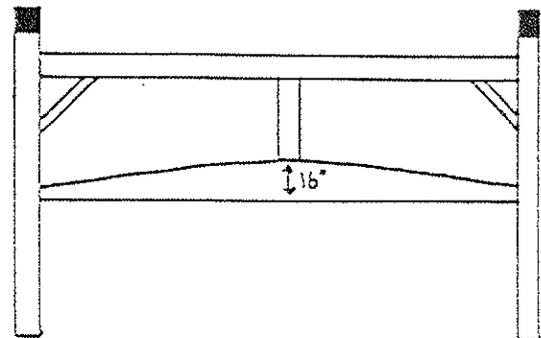
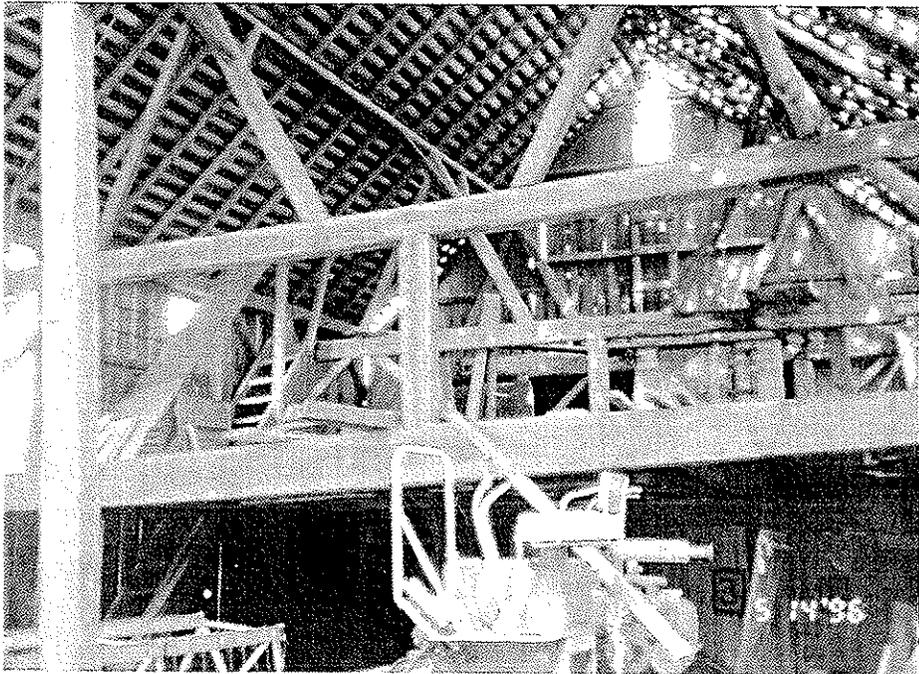
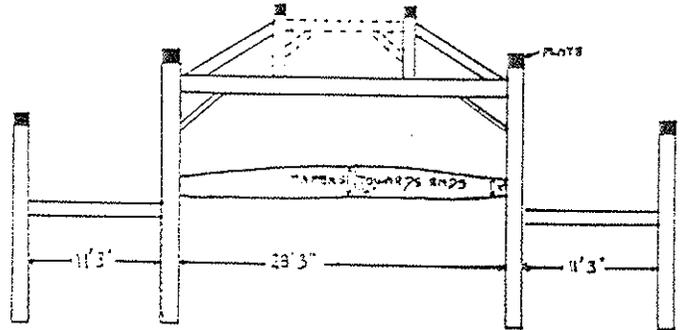
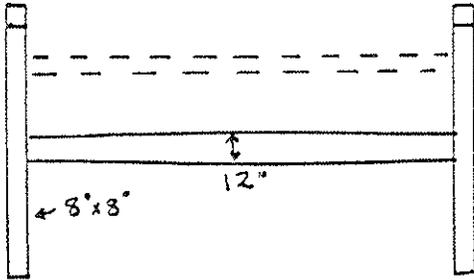


Figure 2h. Configurations of some swing beam bents observed in Linn County Barns. Top: The Matthew Chambers Barn; Center: The Settle-Powell Barn; Bottom: The Fanning Barn.

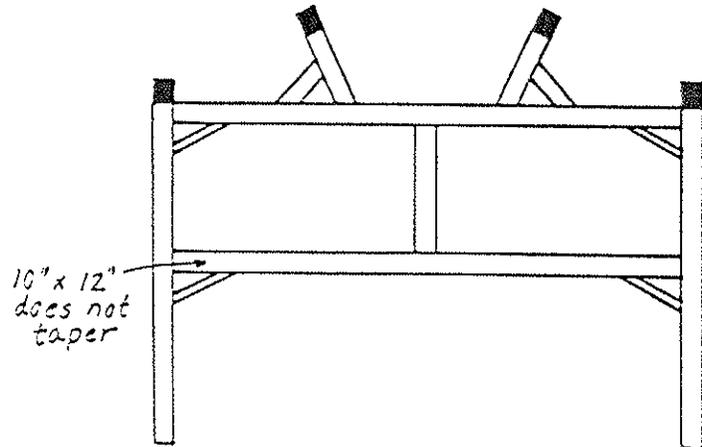
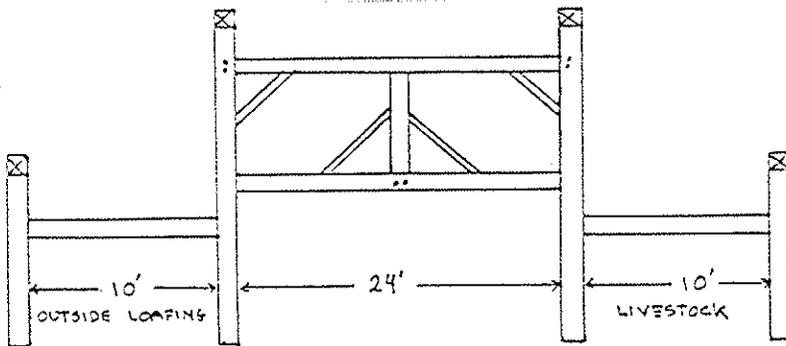
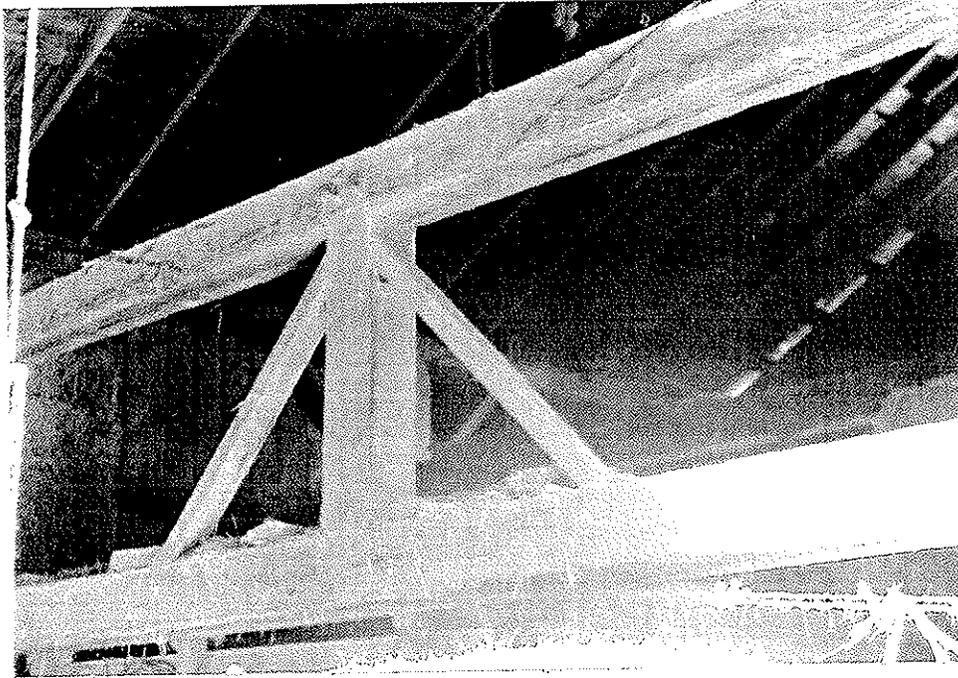
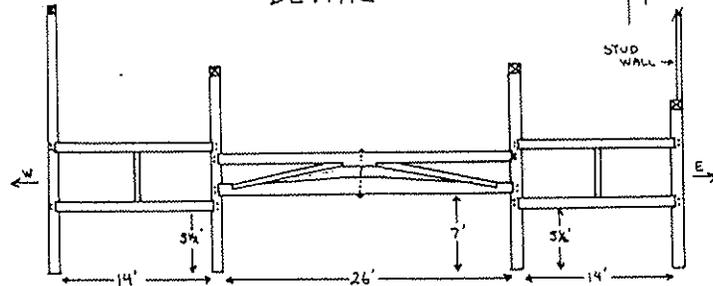
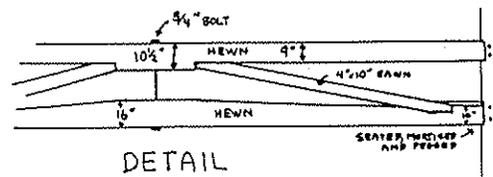
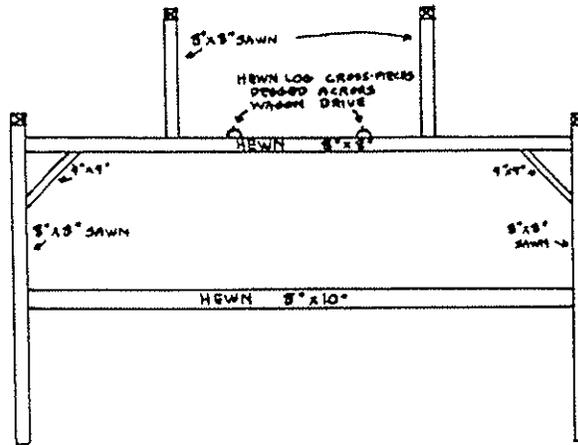
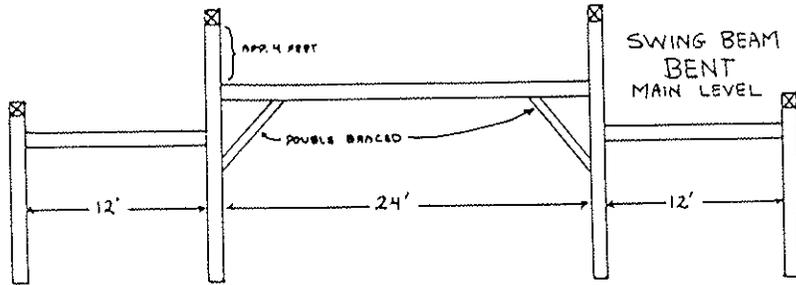
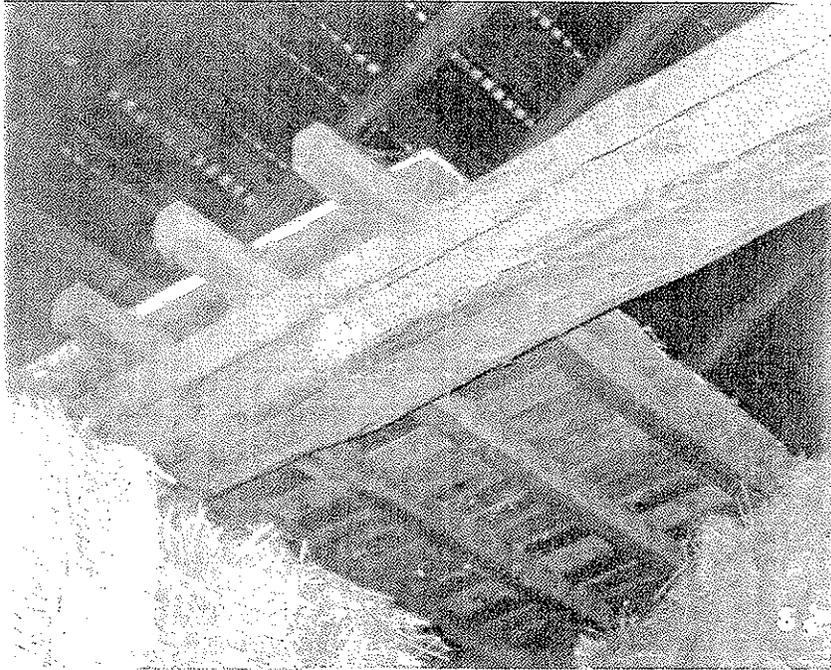


Figure 2c. Configurations of some swing beam bents observed in Linn County Barns. **Top:** The William Cochran Barn; **Center:** The Geisendorfer Barn, 1864; **Bottom:** The Hogue Barn, 1867. The Hogue Barn is an end-opening barn while all other swing beam bents illustrated are from side-opening barns.



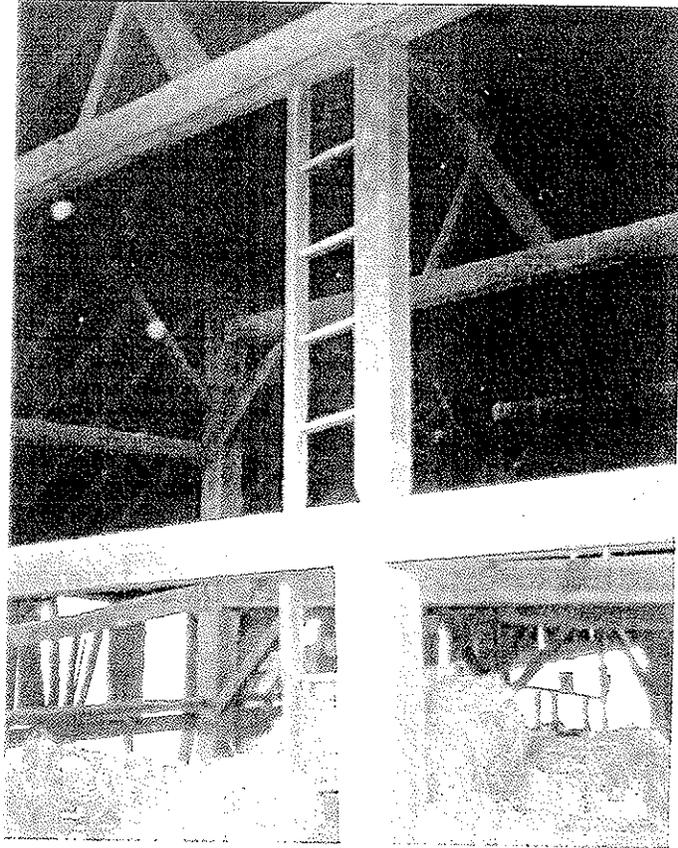
BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 3. Top: Overmow located above the wagon drive in the Cochran Barn. Bottom: Haymow wall in the Joseph Hamilton Barn.



BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 4. Top: Ladder framed in bent in the Fanning Barn. Bottom: Livestock shelter within the envelope of the Powell Barn. Mow in scaffolding above.



BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 5. South elevation and floor plan of the Matthew Chamber's Barn (ca. 1860) expanded with a lean-to on rear elevation and a two bay granary addition on the gable end.

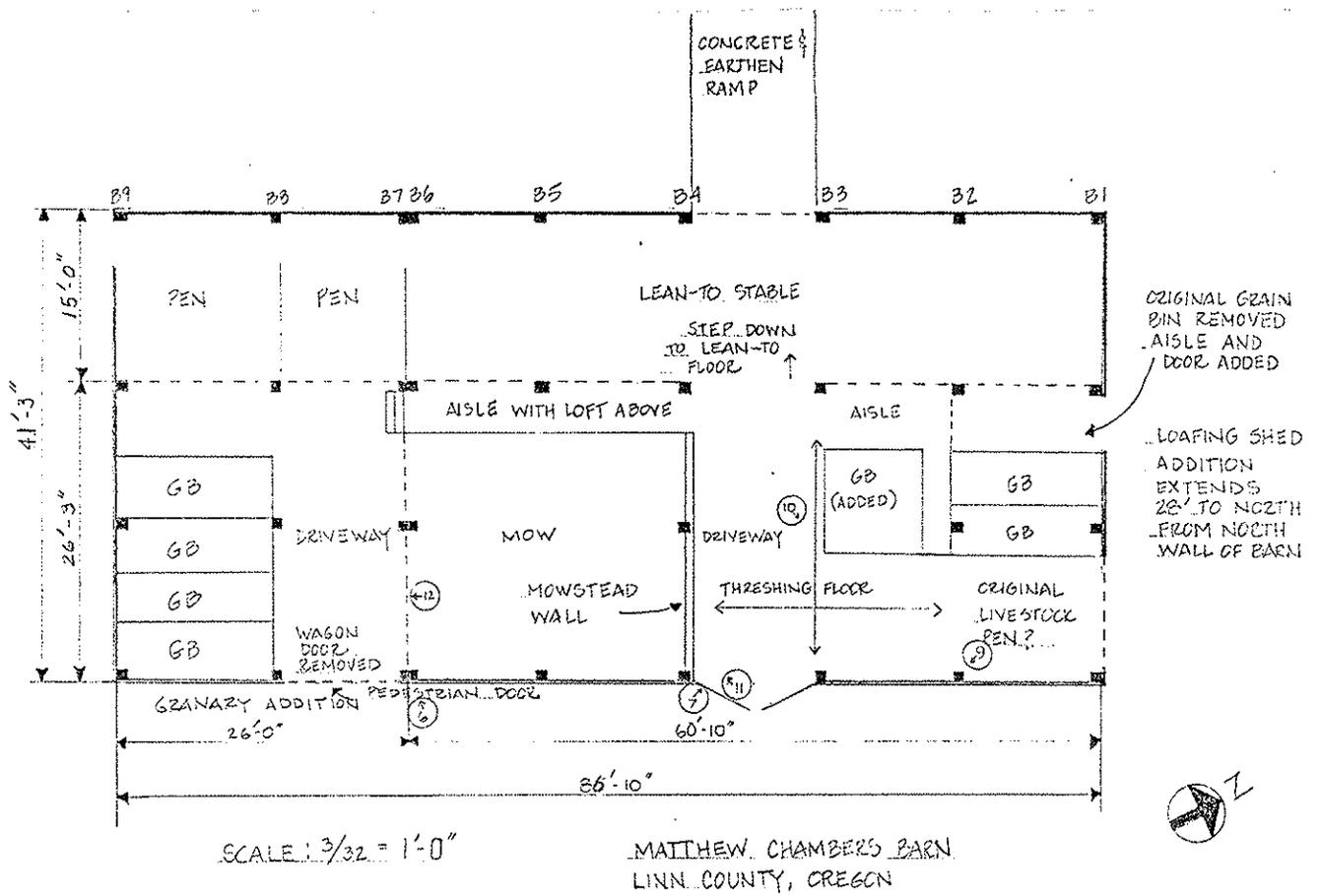
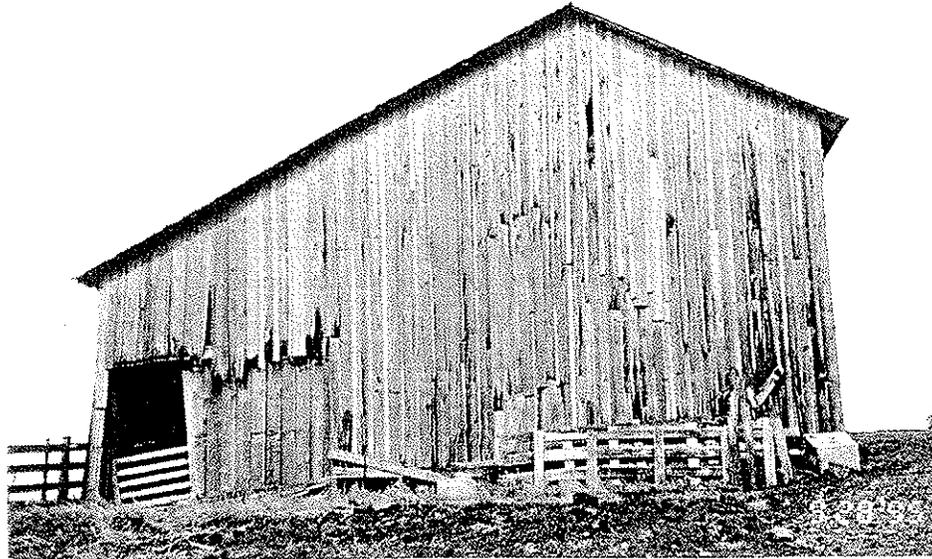


Figure 6. Side-opening (transverse drive), 6-bay plan. The Hugh Leeper Brown Barn, ca. 1850, is the only known extant example of a six bay barn pre-dating 1870 and the only barn with a threshing floor encompassing three bays. (Not drawn to scale.)

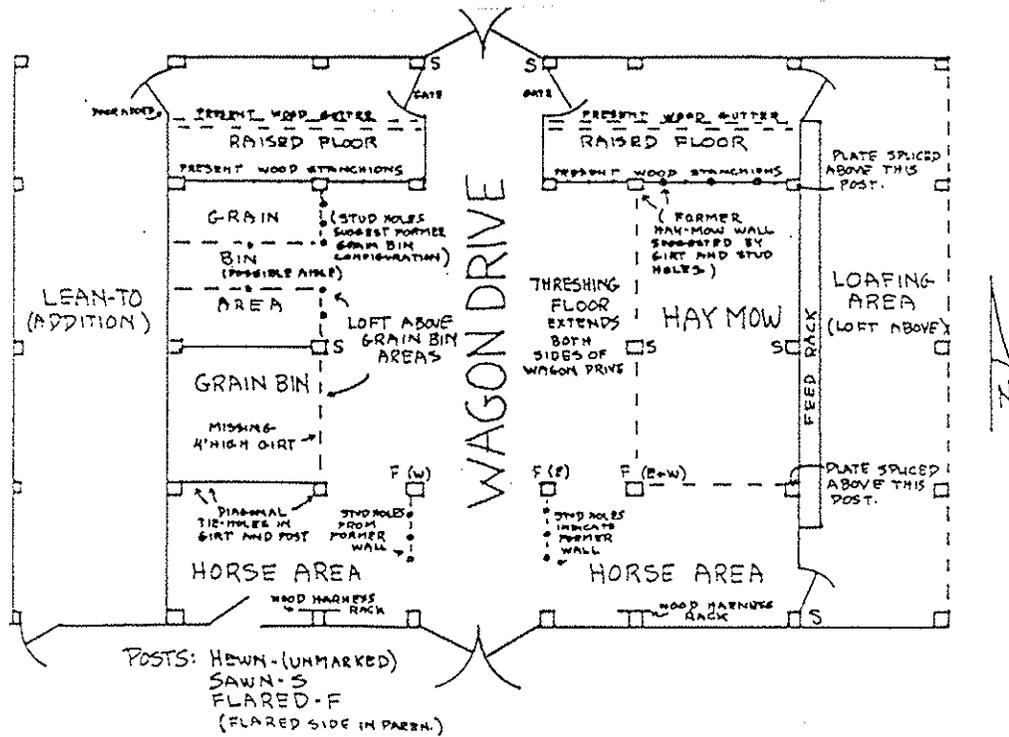
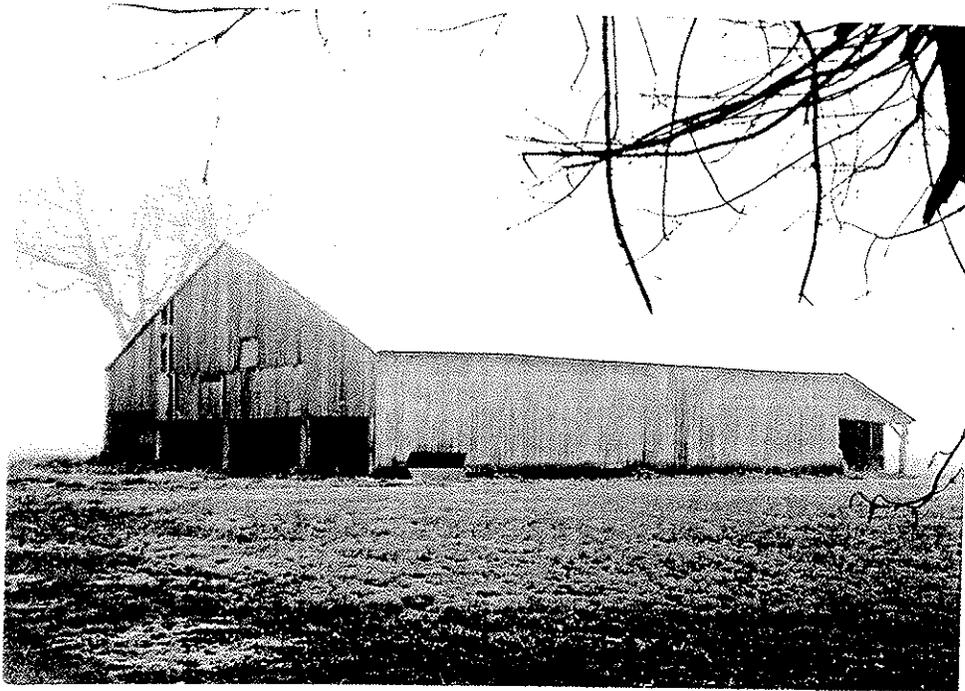


Figure 7. Side-opening (transverse drive), 5-bay plan. The Settle Barn, ca. 1850s. This barn was destroyed by fire in 1996. (Not drawn to scale.)

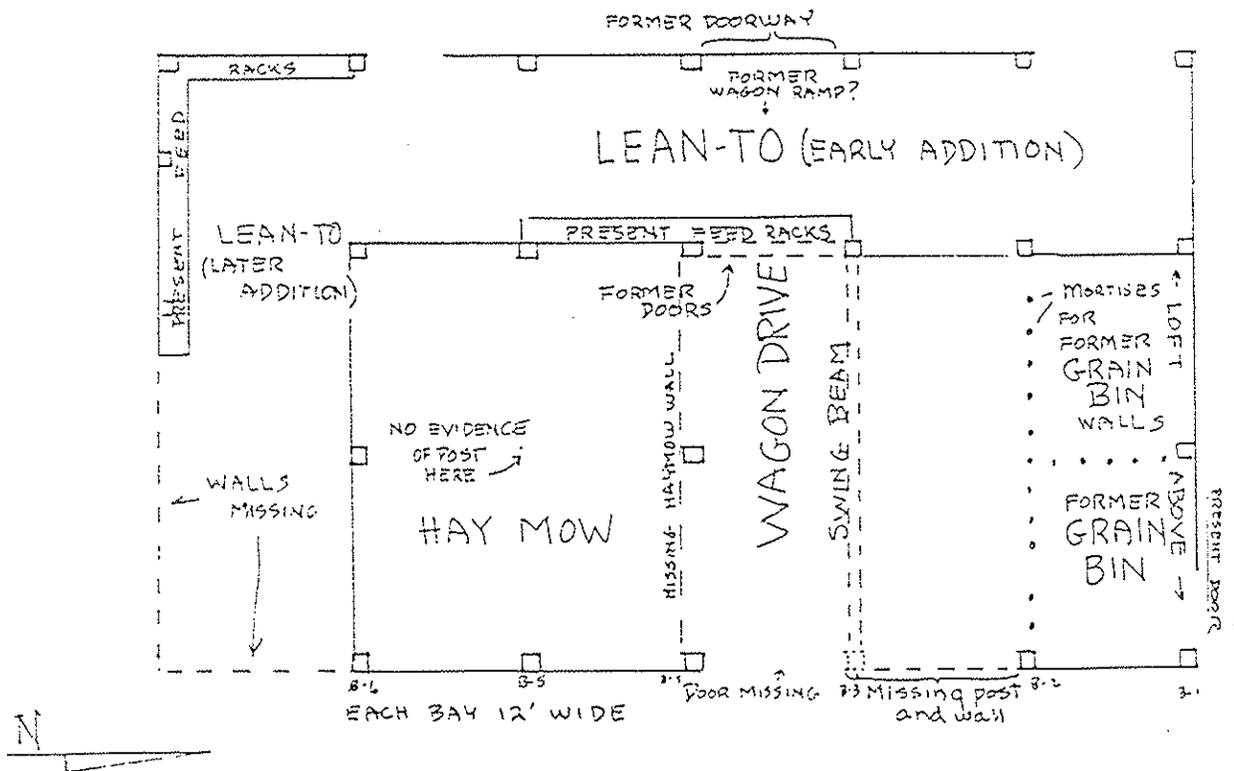
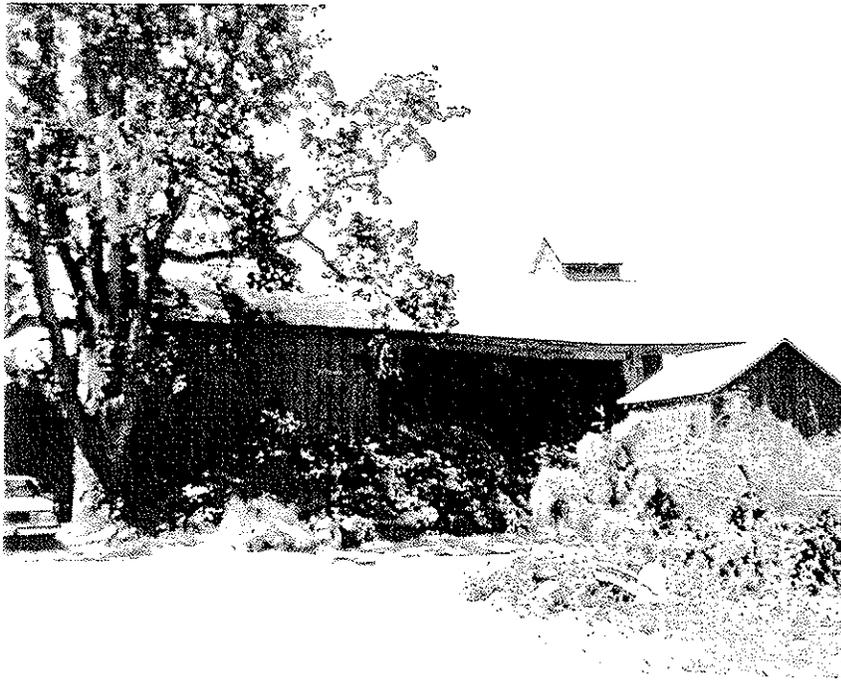


Figure 8. Side-opening (transverse drive), 4-bay plan. The lean-to was added. The hay mow is one bay instead of the two bays in the 5-bay plan illustrated. The Settle-Powell Barn, ca. 1850s. (Not drawn to scale.)

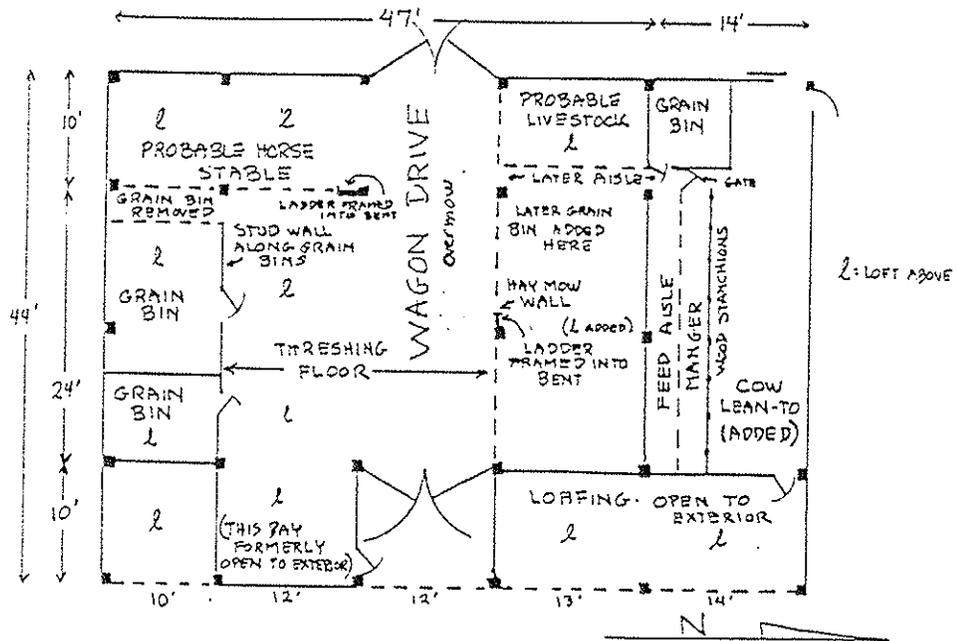
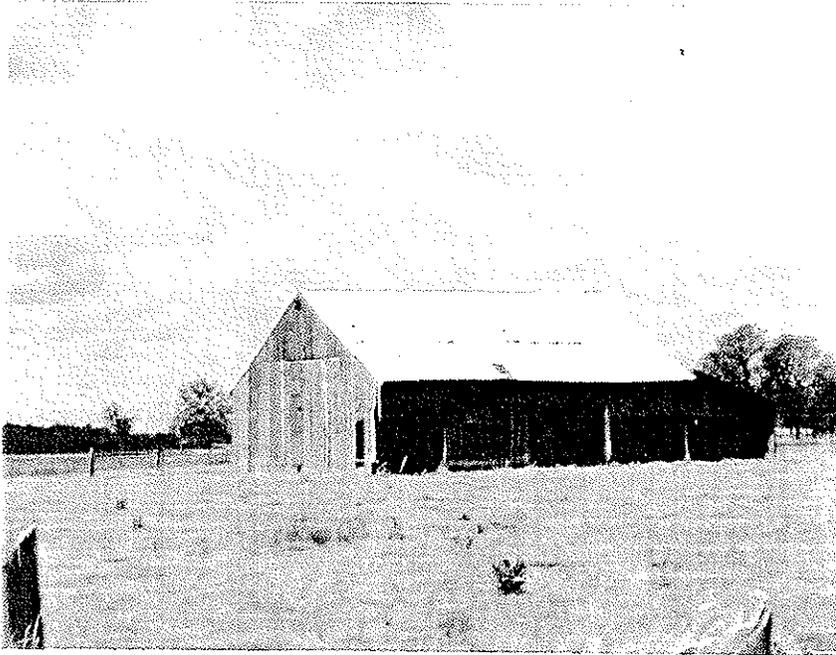
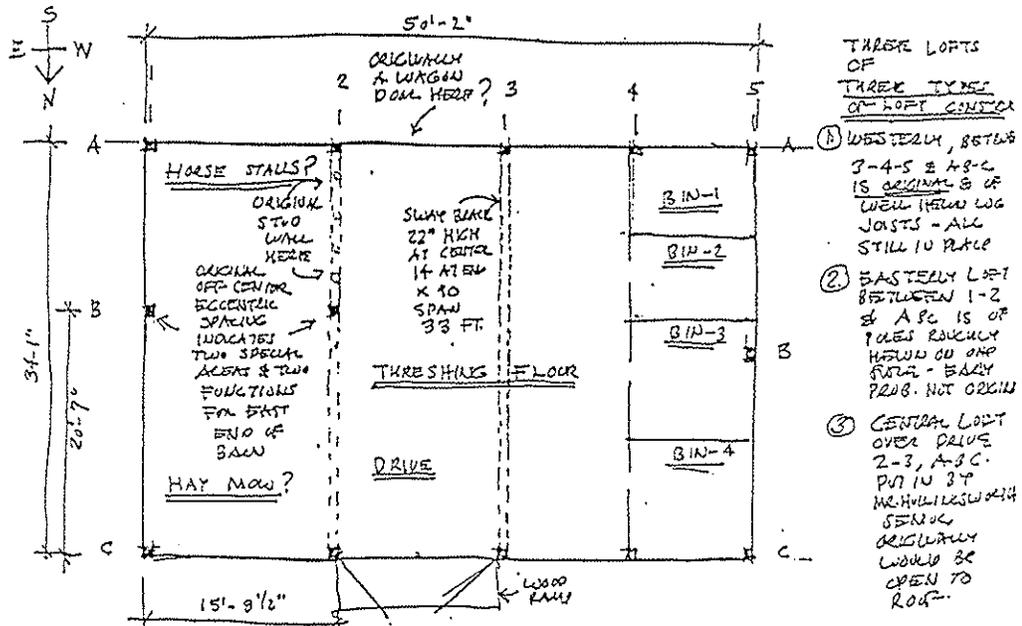


Figure 9. Side-opening (transverse drive), 4-bay plan. The Gideon Backus Barn, ca. 1850s. (Not drawn to scale.)



WERE THERE ORIGINALLY ANY OTHER EXTERIOR DOORS SUCH AS FOR STOCK - SUCH AS ON THE EAST WALL?

BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 10. End-opening (longitudinal drive) barn. The Jackson Barn, ca. 1865. Plan reflects 20th century use of barn. Original plan has not been determined. Hewn tie beam illustrated along the sides of the drive provided 3-aisle wide spans uninterrupted by posts. (Not drawn to scale.)

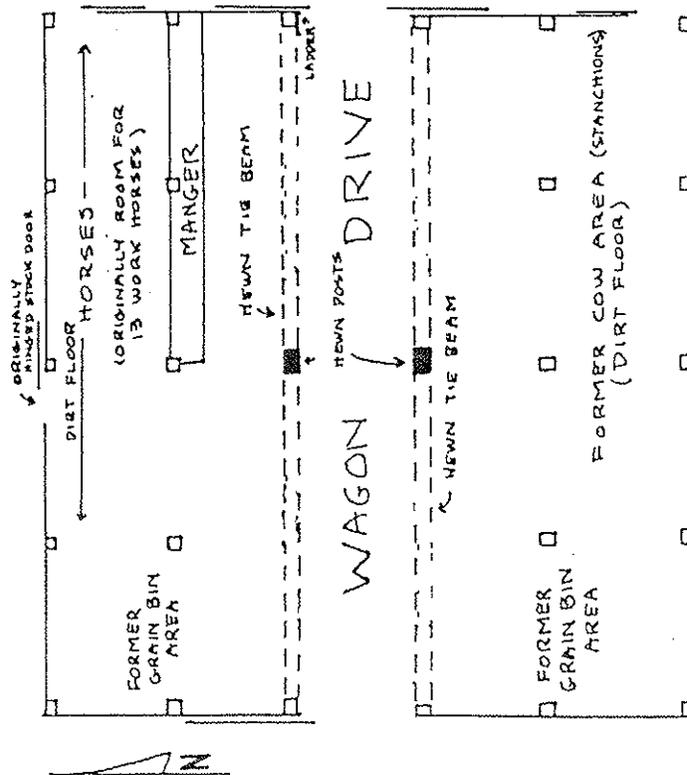
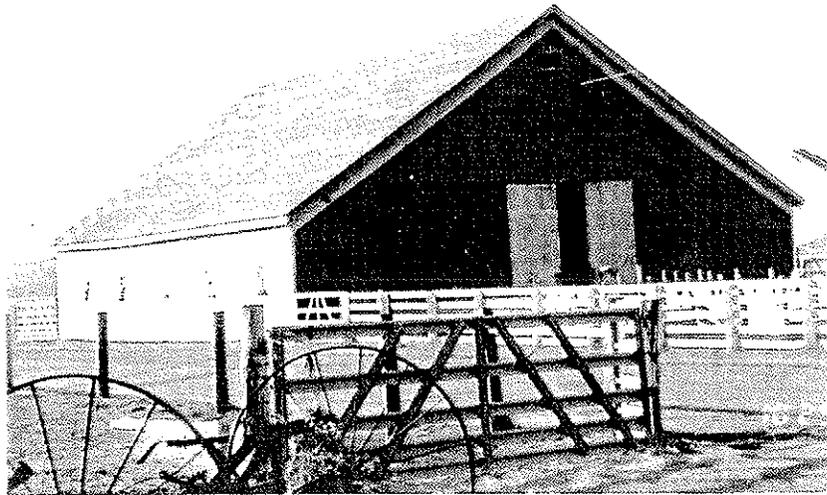
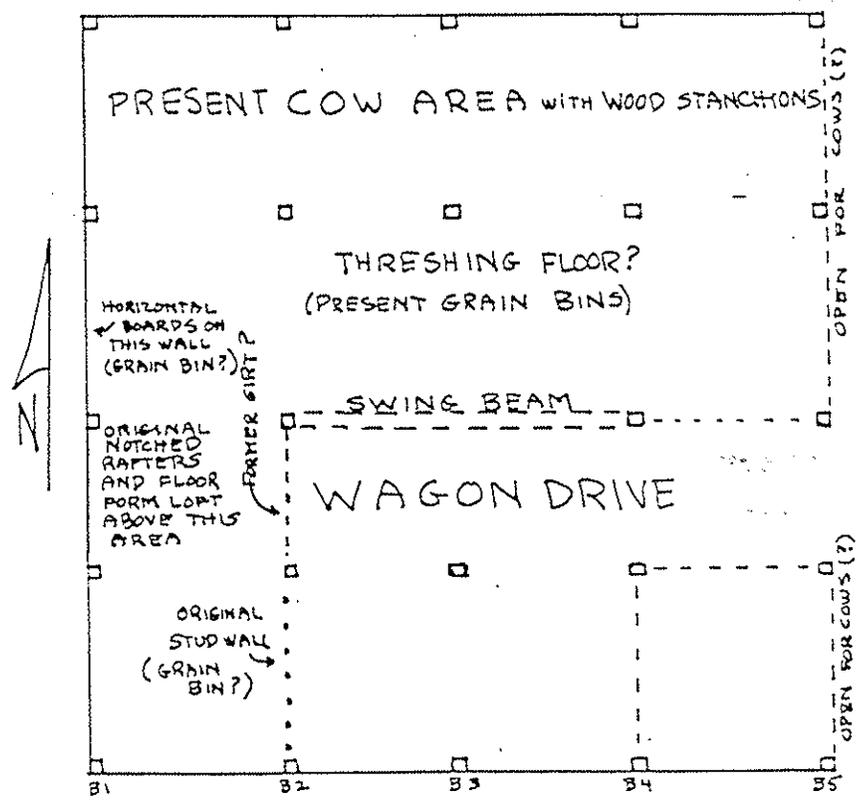
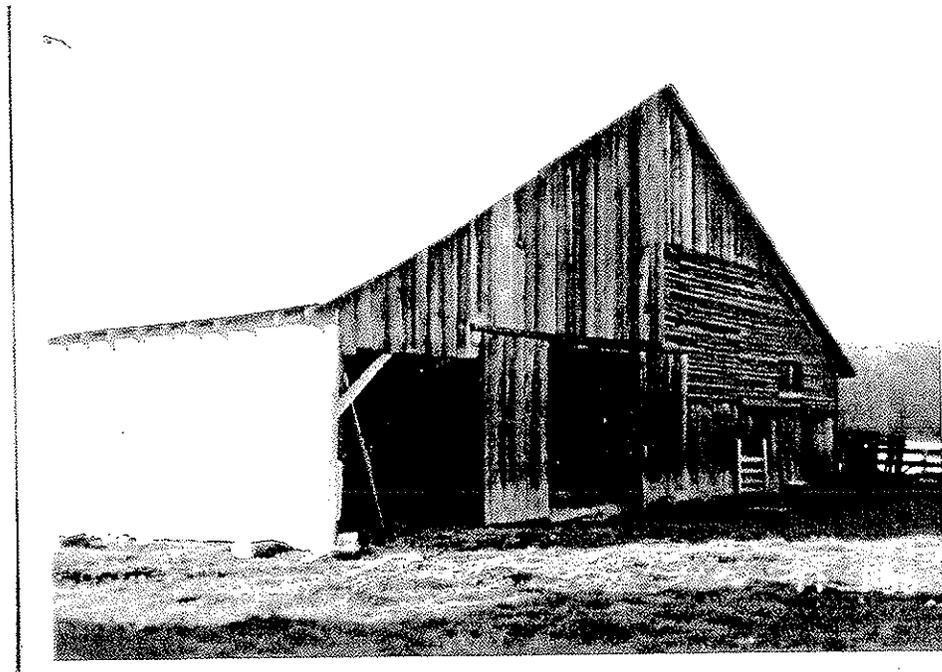


Figure 11. End-opening (longitudinal drive) barn. The Hogue-Sprenger Barn, ca. 1867. Original plan has not been determined but swing beam on one side of drive could have provided threshing floor. (Not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 12. End-opening (longitudinal drive) barn. The Kinzer Barn, ca. 1865. Three aisles wide and five bays deep with a lean-to for livestock (Not drawn to scale.)

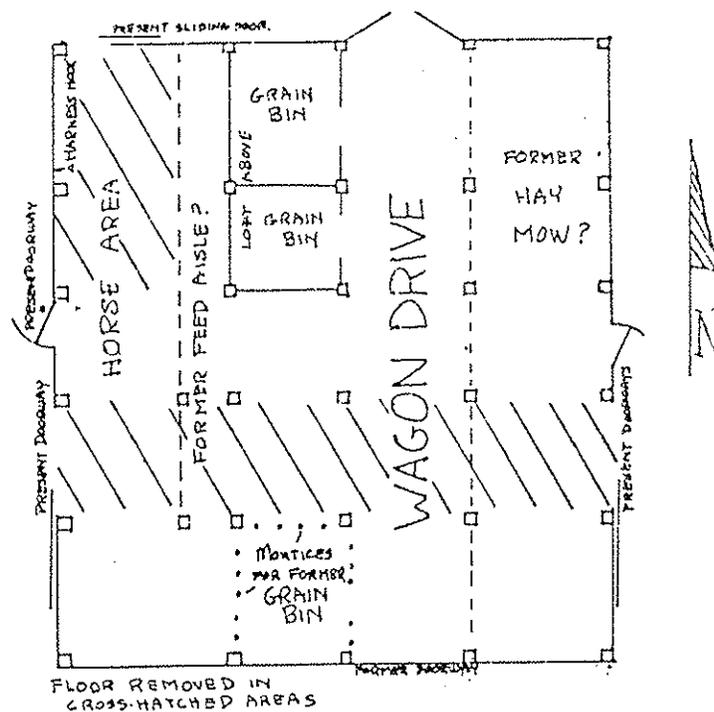
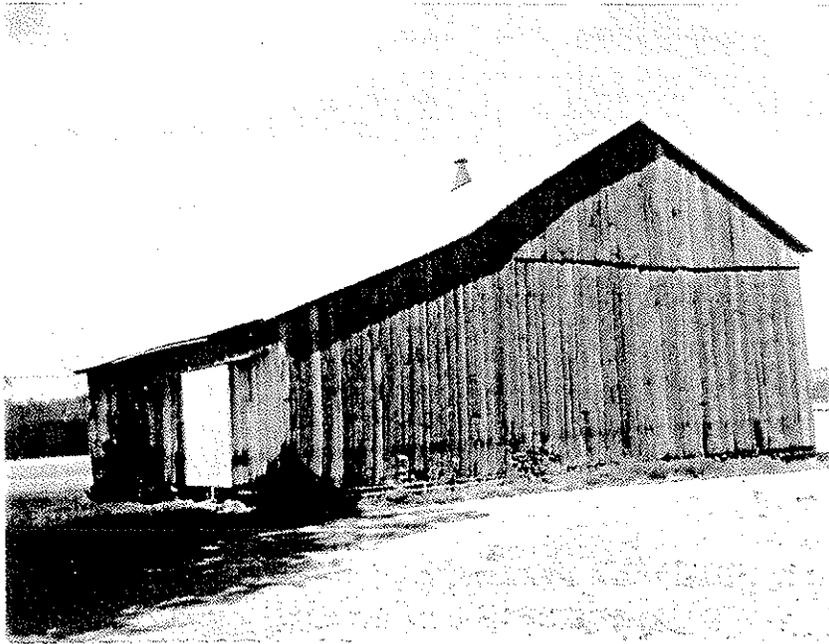


Figure 13. Side-opening (transverse drive), bank barn with 4-bay plan. The Cochran Barn, ca. 1865, is the only extant example of a pre-1870 bank barn and the only bank barn located in the 1996 survey which pre-dated 1900. The Cochran barn is unique because it has bank access from a side-end and a gable-end. This has resulted in a combined transverse and longitudinal configuration of the drive on the main level providing for through entry and egress which, because of the bank, would not have been possible with a single directional drive. The barn is also unusual for the number of mows which may be associated with Mr. Cochran's large livestock operation. The lower level of the barn was used for livestock. (Drawn to scale but reduced.)

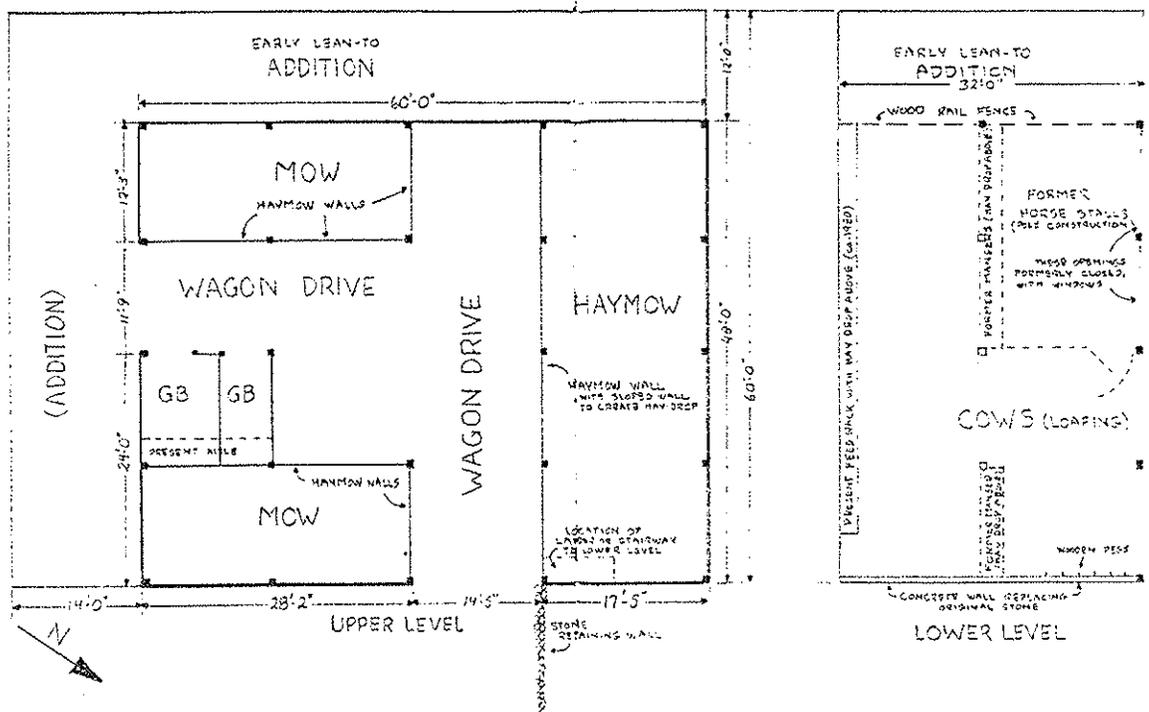
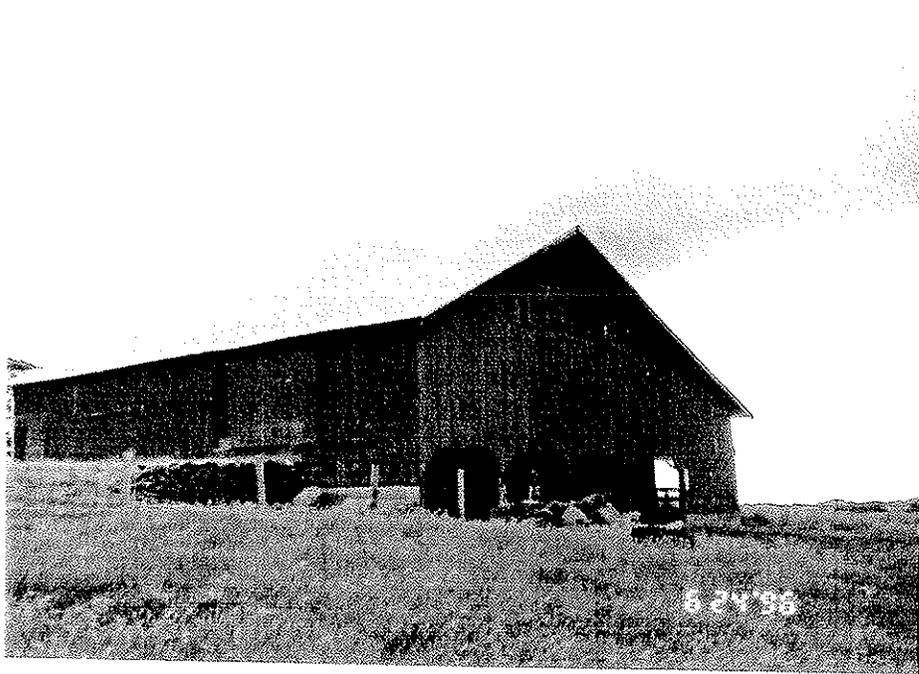
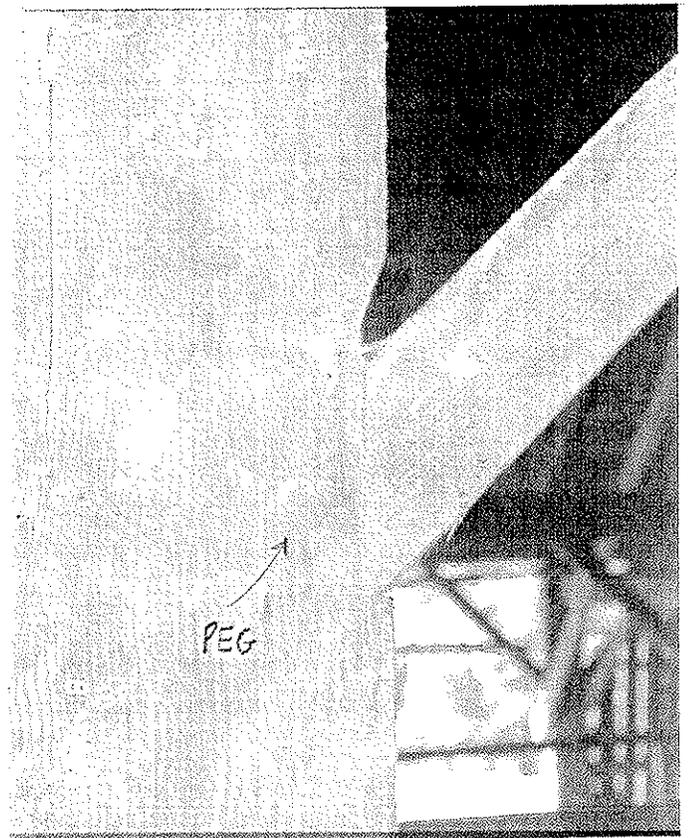
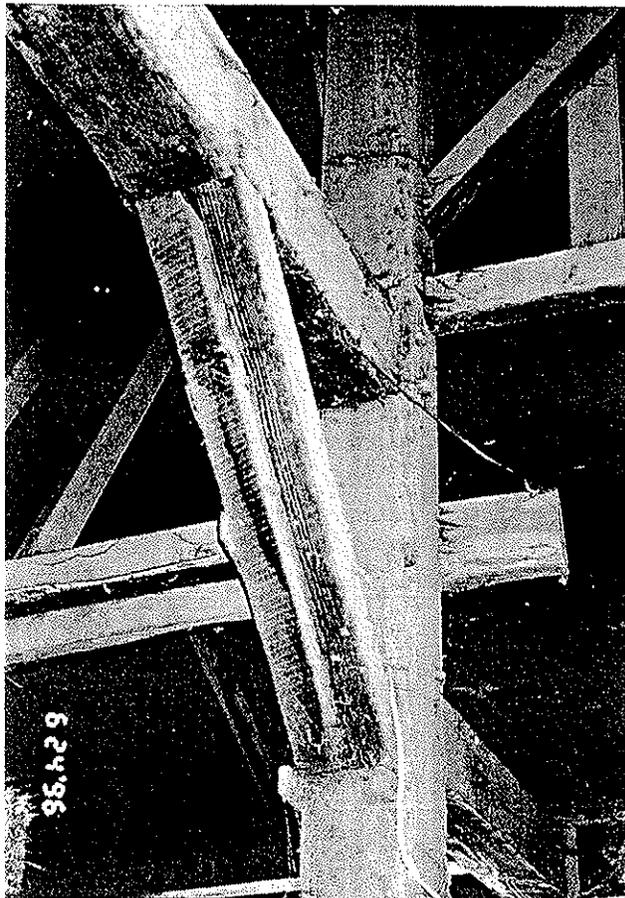
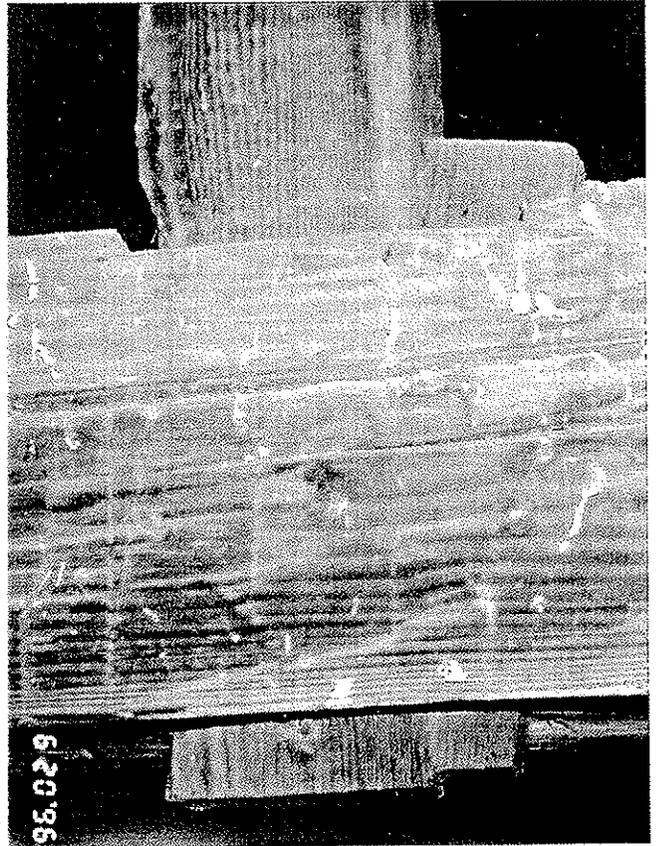
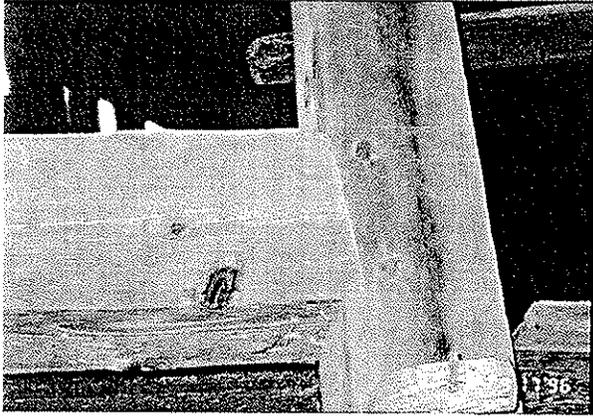


Figure 14 . Mortise and tenon joinery. **Top left:** Mortise and tenon with diminished haunch. Post-tie beam in the Powell Barn. **Top right:** Wedged mortise and tenon in the Hugh Leeper Brown Barn. **Bottom left:** Double braces incorporated in bent in William Cochran Barn. **Bottom right:** Mortise and tenon used for brace in the Fanning Barn, one of the few barns in the county with pegged brace joints.

BARN DESIGN AND CONSTRUCTION, 1845-1870



Linn County Barn Context

Figure 15 . Scarf joints. Top: Half lap scarf joint. Center: "Tongue and fork" scarf joint. Bottom: Wedged stop splayed scarf joint.

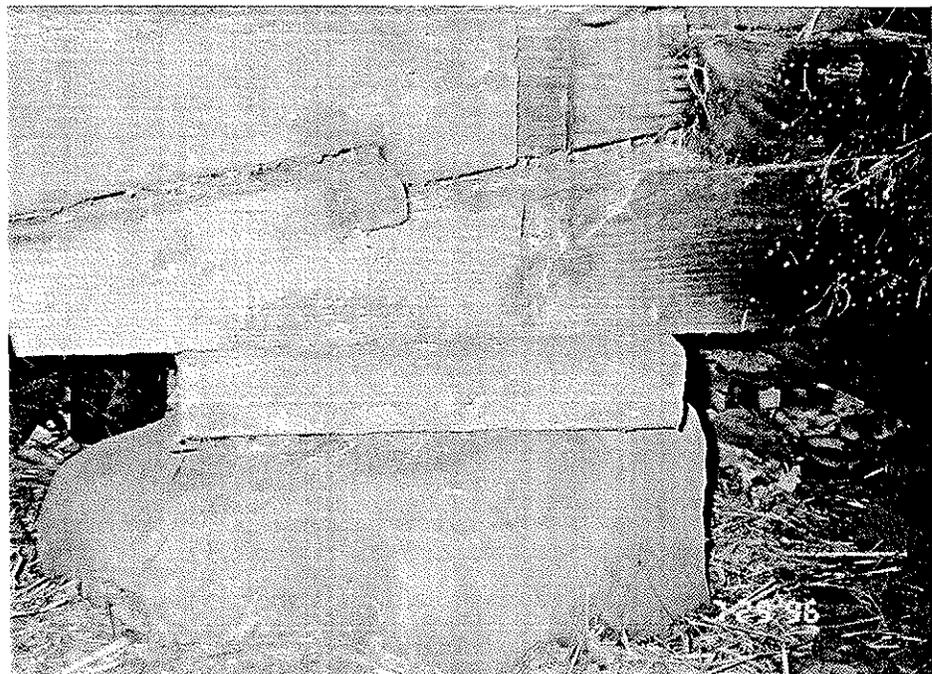
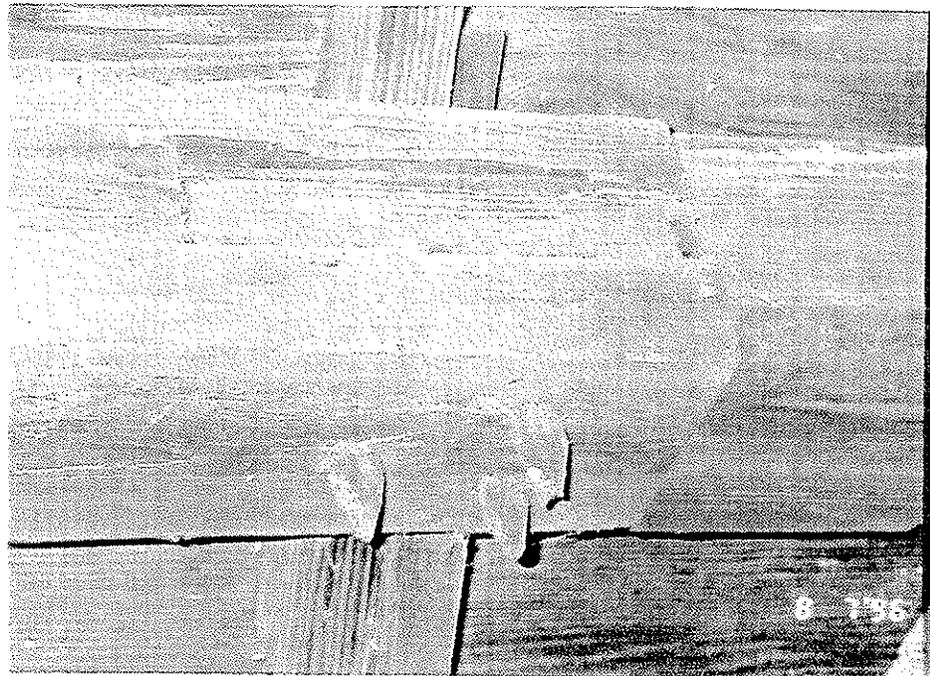
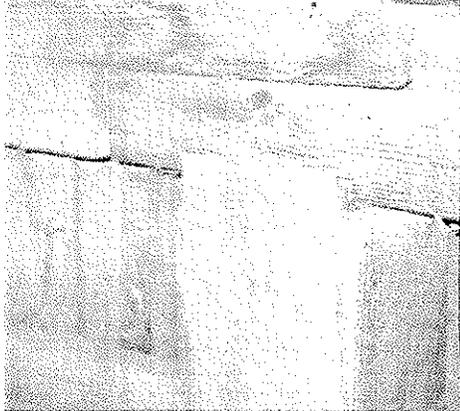
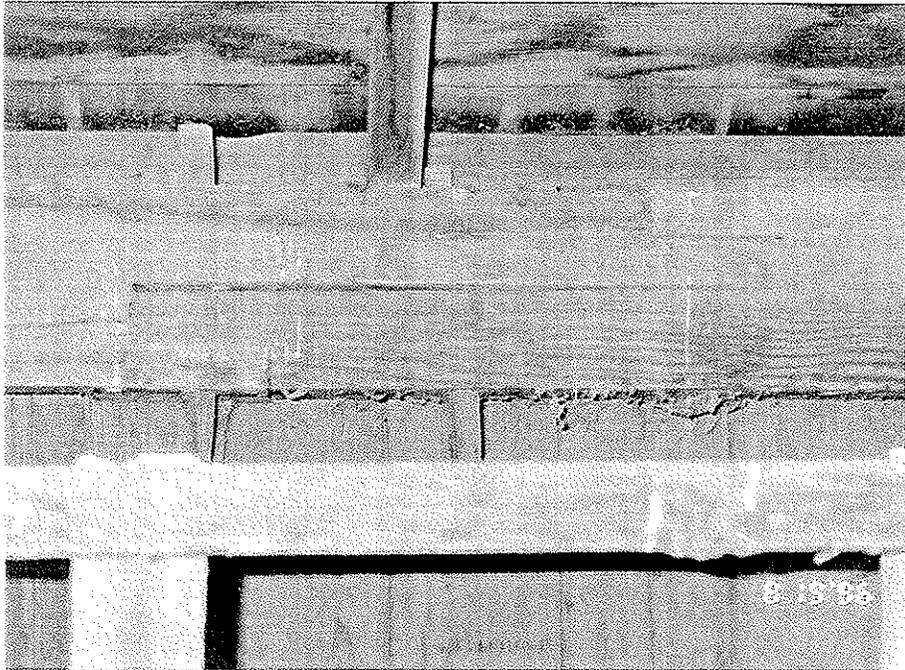
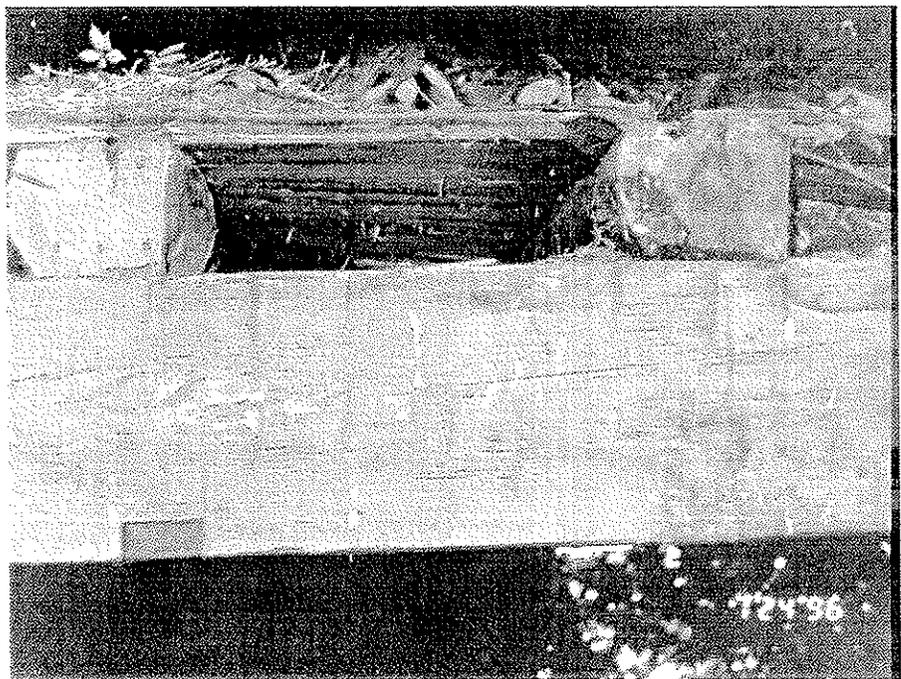
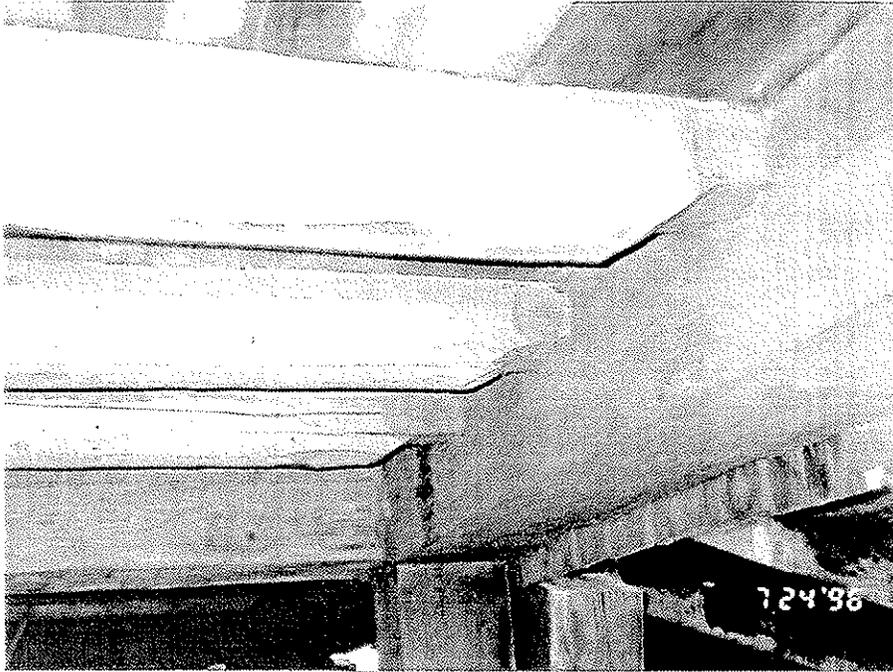


Figure 16 . Stepped Scarf Joint.



BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 17 . **Top:** Peeled log joists used for the substructure of the Kinzer Barn. **Bottom:** Hewn beam in the Settle Barn. Note mortise for grain bin stud. Log joists above originally supported mow.



BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 18. Fieldstones and wood posts used for the foundation of the Matthew Chambers Barn built in ca. 1860.

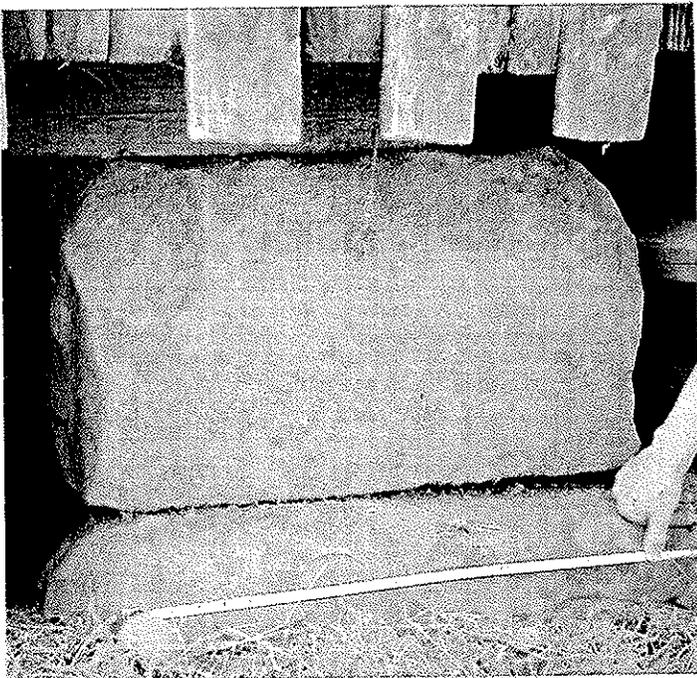
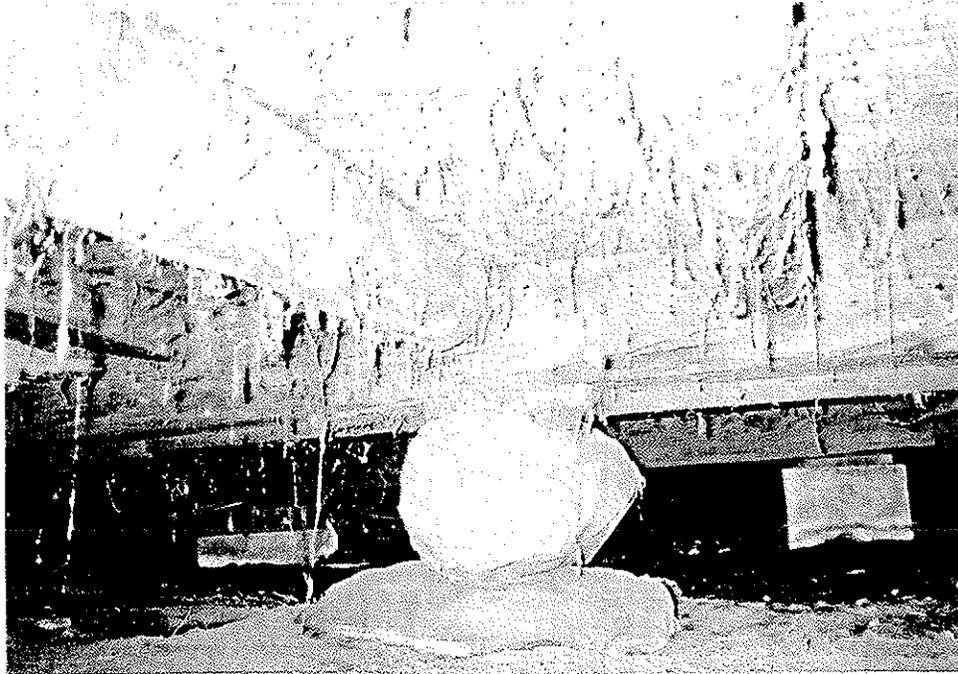
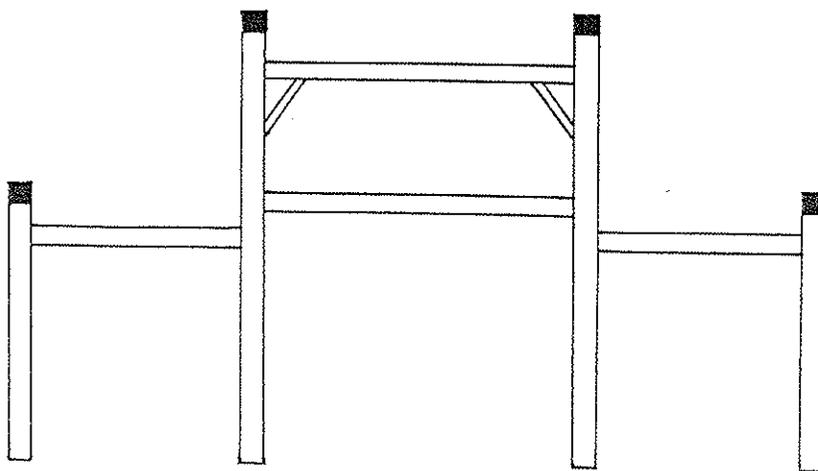
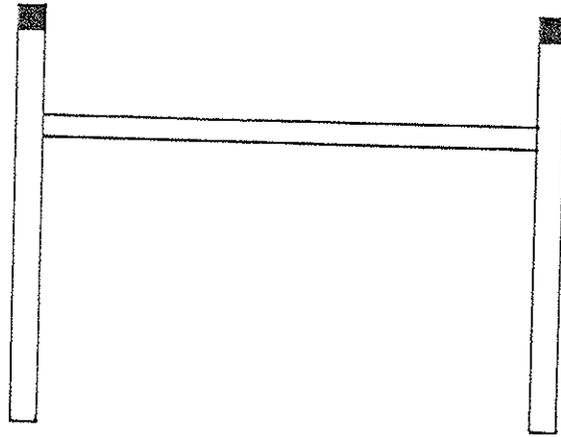


Figure 19. Examples of timber frame barn bents found in pre-1870 Linn County Barns. **Top:** "H" bent configuration for a side-opening barn. **Bottom:** Interior bent of the Putman Barn, a side-opening barn with integral "lean-tos" encompassed by an unbroken roof line. (Not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 20. Examples of timber frame barn bents found in pre-1870 Linn County Barns. **Top:** Examples of timber frame barn bents with upright purlin plate posts. **Left:** The interior bent of a side-opening barn; **right:** Interior bent of the D.F. Crabtree Barn, an end-opening barn. **Bottom:** Examples of timber frame barns with canted purlin plate posts. **Left:** The end bent of the Hamilton Barn, a side-opening barn. **Right:** Interior bent of the Kinzer Barn, an end-opening barn with a lean-to. (Not drawn to scale.)

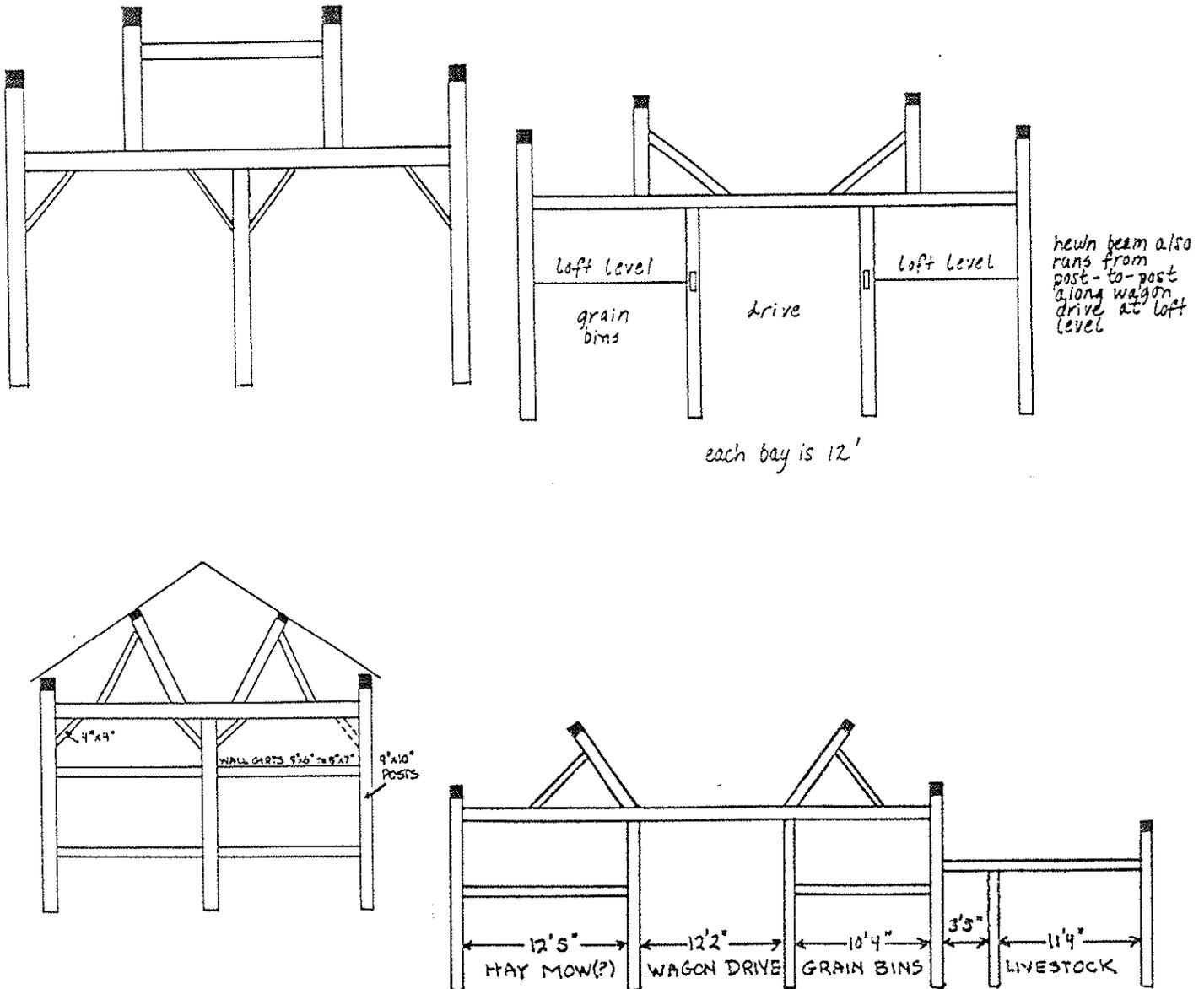
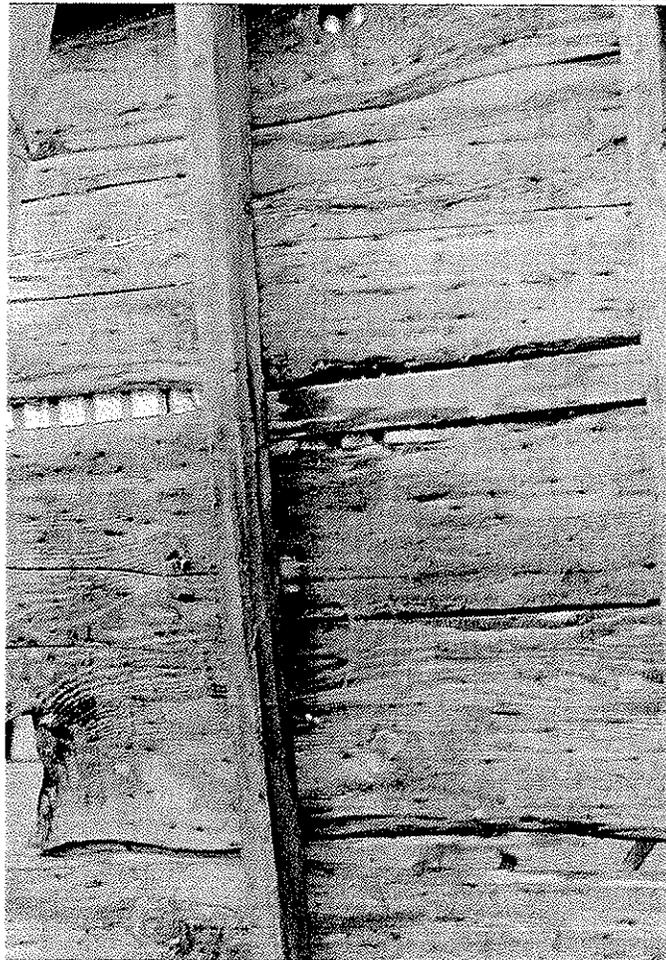
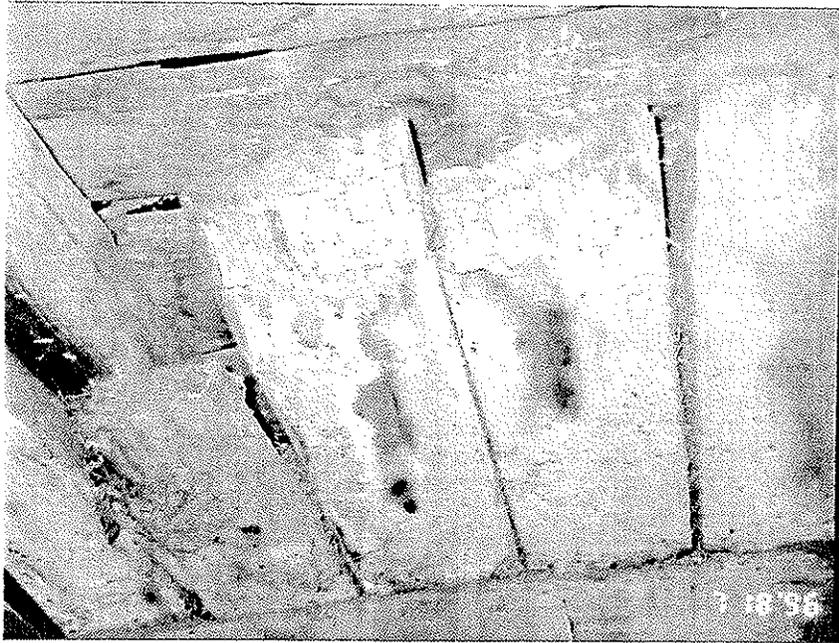


Figure 21. Top: Double notch (step-lapped) rafter seat. Bottom: Rafter attached to plate with a wooden peg in the Settle Barn.



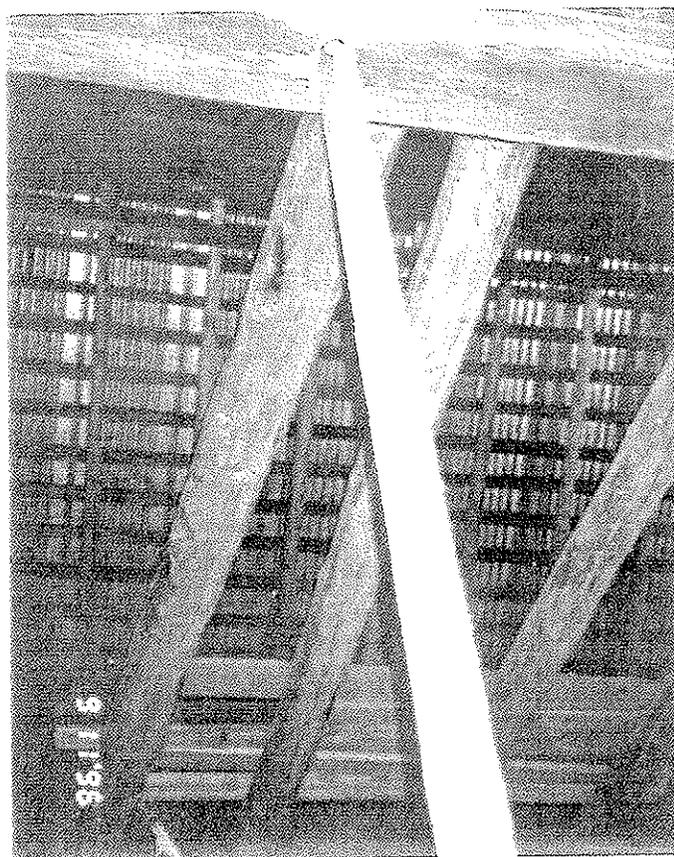
BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 22. Top: Stub shot boards. Bottom: Waney-edged roof sheathing.



BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 23. Standard post in door, looking up to mortise in door girt.



BARN DESIGN AND CONSTRUCTION, 1845-1870

Figure 24. Top: Hand wrought hardware on the Hugh Leeper Brown Barn. Left: Interior door latch with illustration from 1870 issue of the periodical Rural Affairs. Right: Exterior hinge. Bottom: Wood harness peg drilled into post in the Fanning Barn.

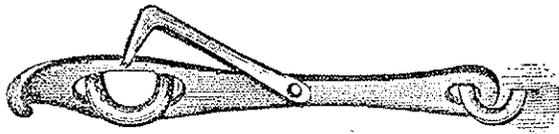
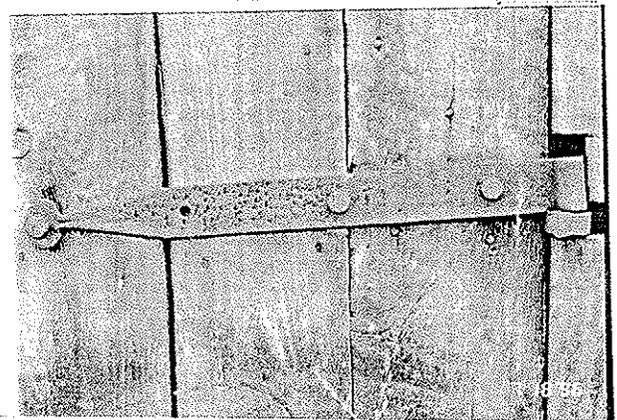
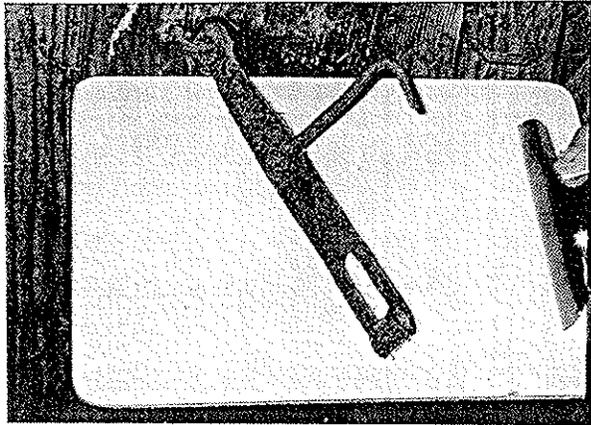


Fig. 36.

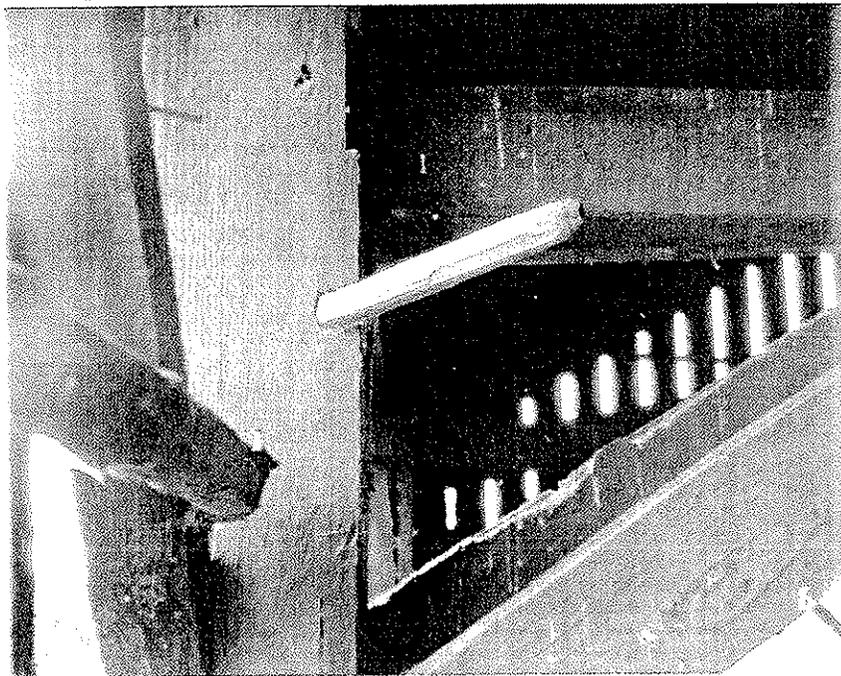
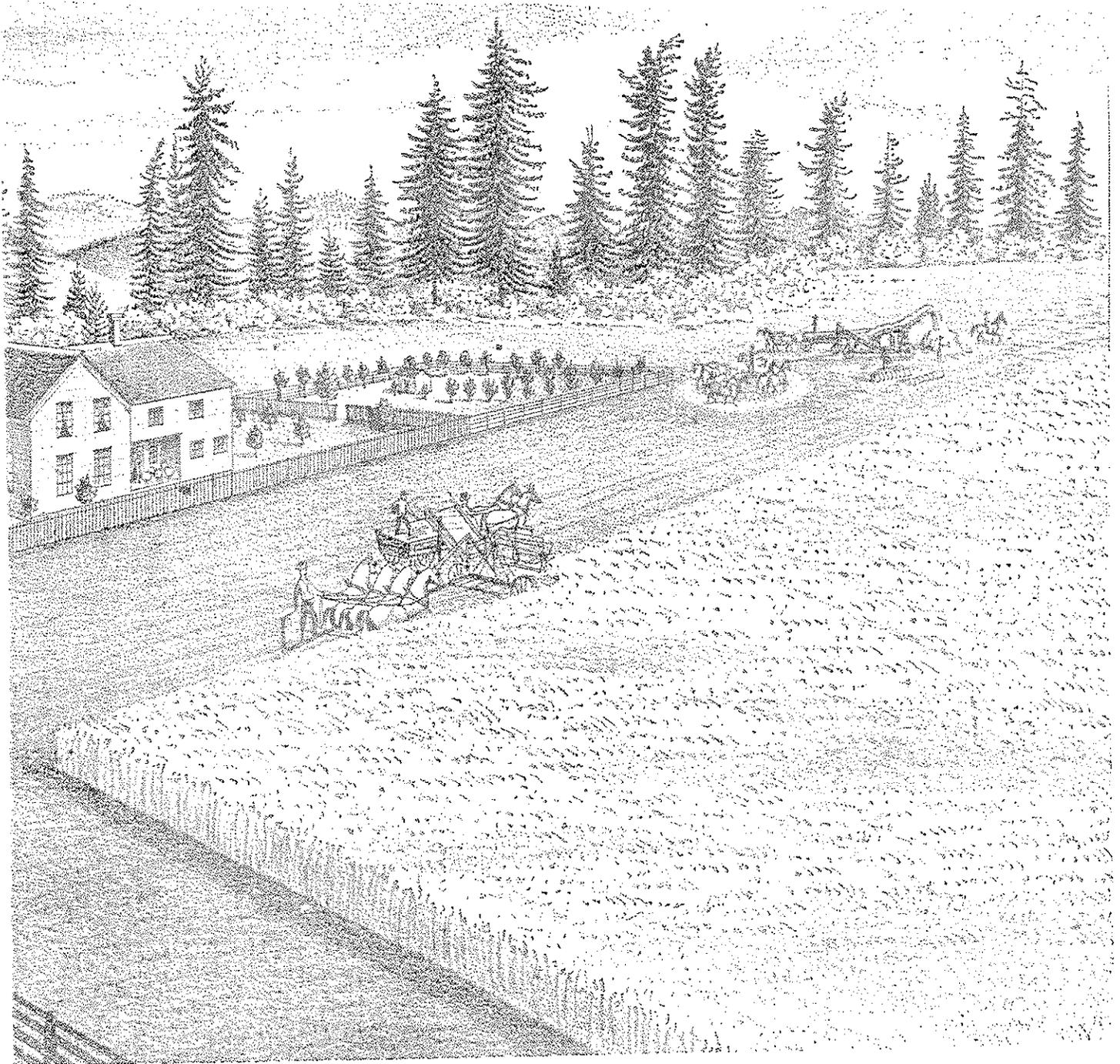


Figure 25 . Harvesting wheat on the David A. Millhollen Farm (Williams 1878). Note the header cutting the grain and depositing it into the wagon to be delivered to the threshing machine which was operated by "sweep power." The sweep power transferred the motion of circling horses to gears and shafts leading to the threshing cylinder.



BARN DESIGN AND CONSTRUCTION, 1871-1899

Figure 26. Harvesting wheat on the J. Geisendorfer Farm (Williams 1878). Note the "tread power", utilizing two horses made to walk an endless incline, used to operate the threshing machine. The J. Geisendorfer barn, built in ca. 1864, is still extant.

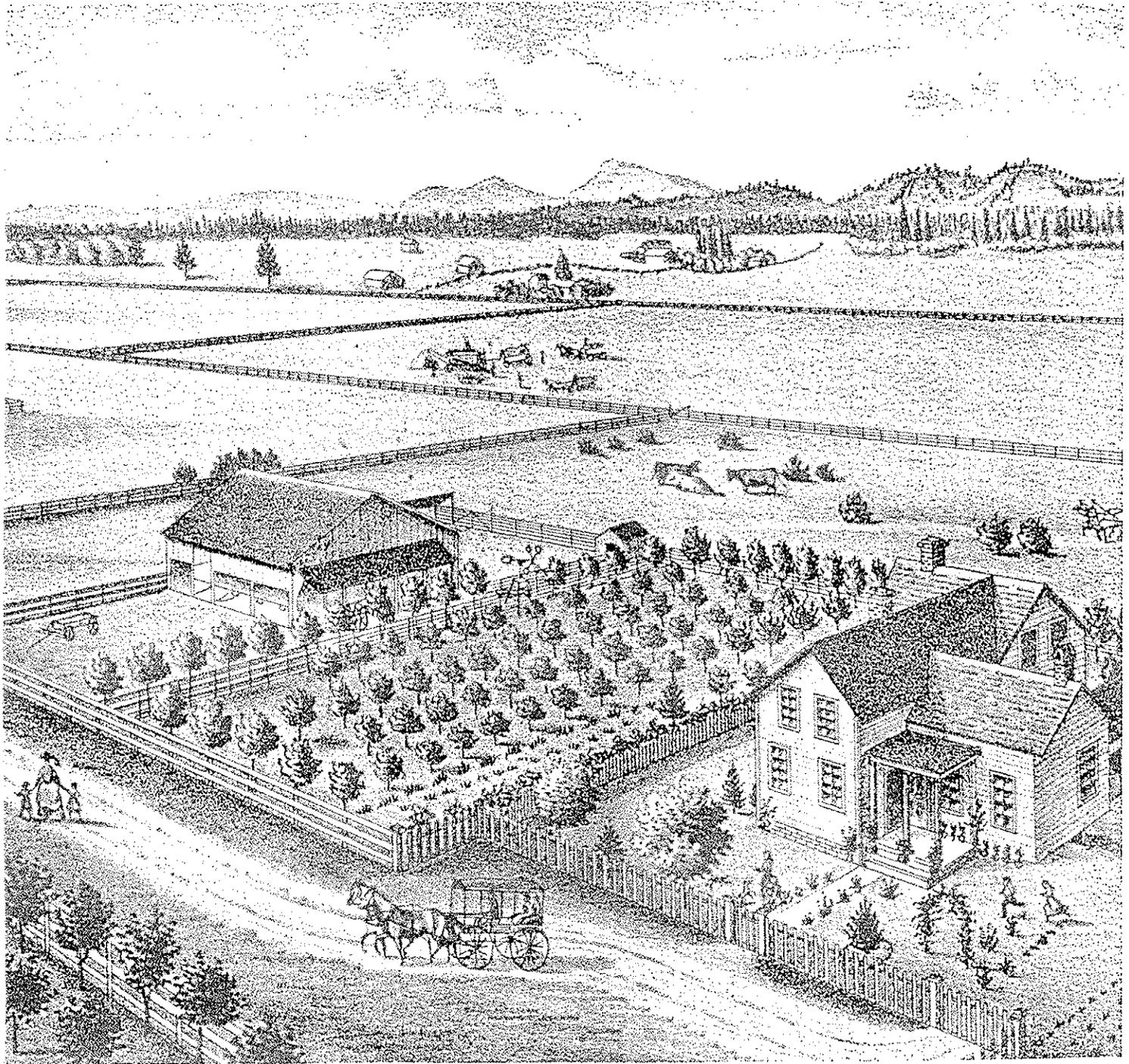
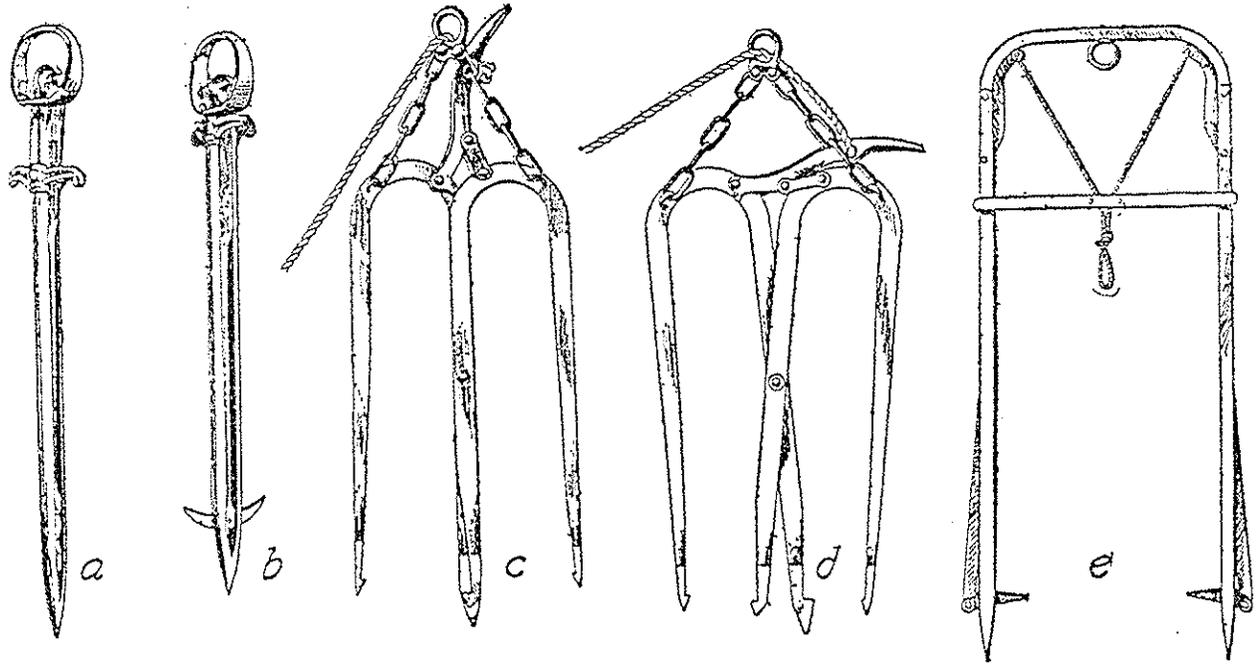
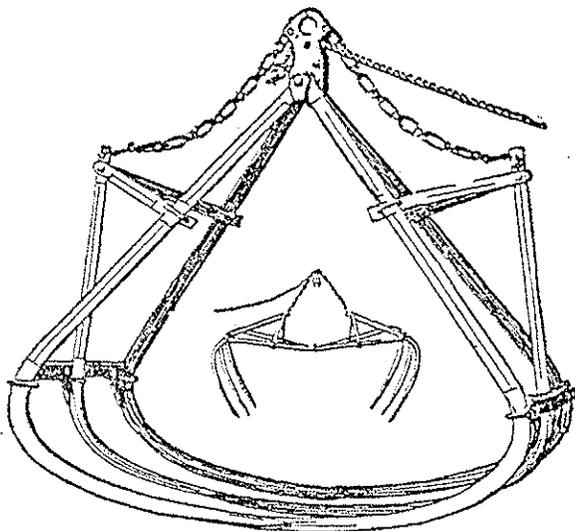


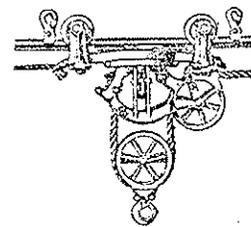
Figure 28. Hayforks illustrated in Farm Knowledge. (Roberts 1918)



Types of hayforks. a,b: single harpoon, open and closed. c,d: triple harpoon open and closed. e: double harpoon closed (opened by pulling the rope loop in the center).

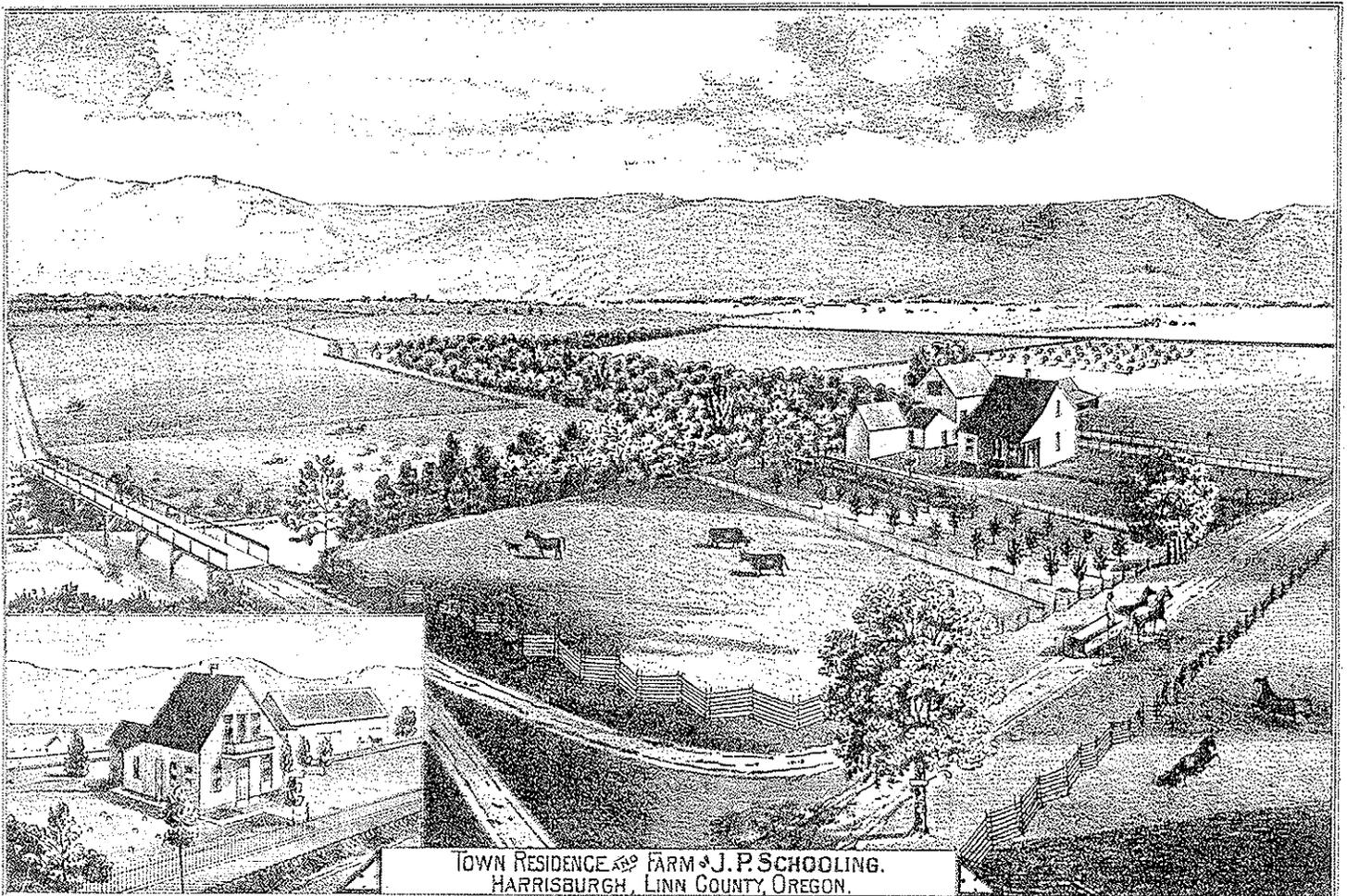


Grapple type of hayfork



Hay carrier

Figure 29. Barn with exterior hay opening or door in gable. The Farm of J.P. Schooling illustrated in 1878.²⁰



²⁰ Williams, Edgar, *Historical Atlas Map Marion and Linn Counties Oregon*, San Francisco, California: Edgar Williams & Co., 1878, p. 59. (Original reprinted by the Marion County Historical Society and the Friends of Historic Albany in 1976 and 1981.)

BARN DESIGN AND CONSTRUCTION, 1871-1899

Figure 30 . Examples of timber frame barn bents with secondary posts to purlin plate. Top: Hale Barn, ca. 1880(?), has canted purlin posts; center: Cyrus Barn, 1884, has upright purlin posts; bottom: McElmurry Barn, ca. 1893, is unique in the county with six purlin elements providing support between the plates and the ridge. (Not drawn to scale)

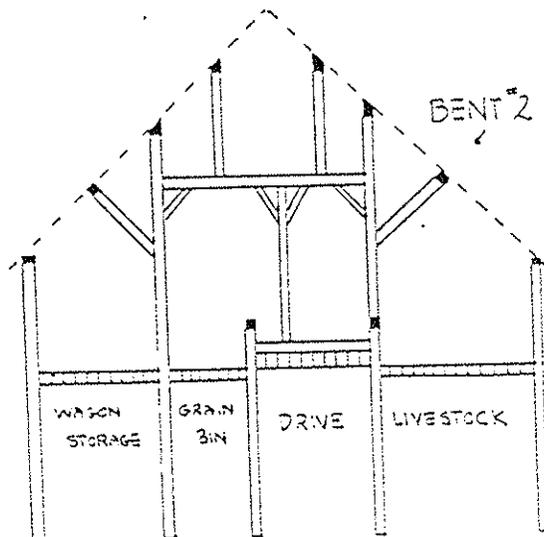
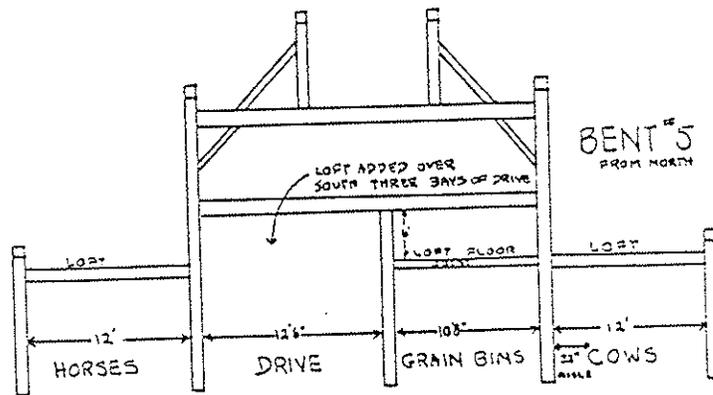
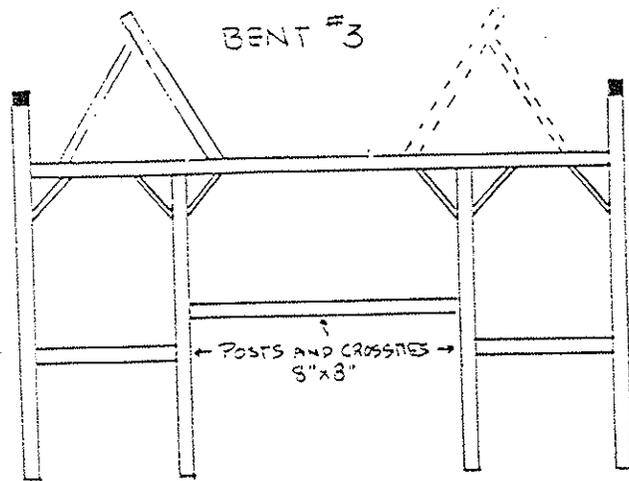


Figure 31. Examples of timber frame barn bents with a post to purlin plate configuration. Upper left: McMahan Barn ca. 1880s; upper right: Grimes Barn ca. 1880s; lower left: Pierce Barn 1890s; lower right: Bryan Barn 1890s(?). (Not drawn to scale)

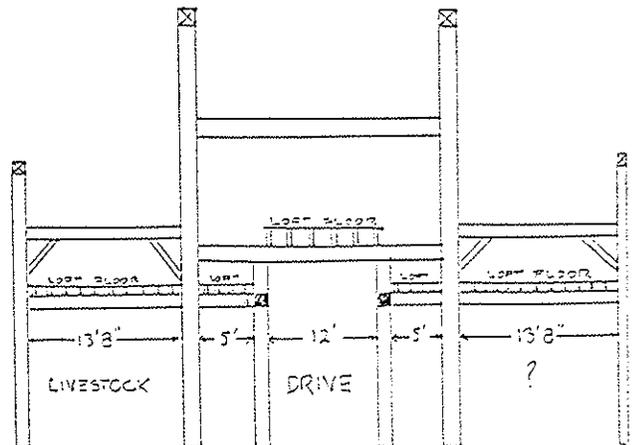
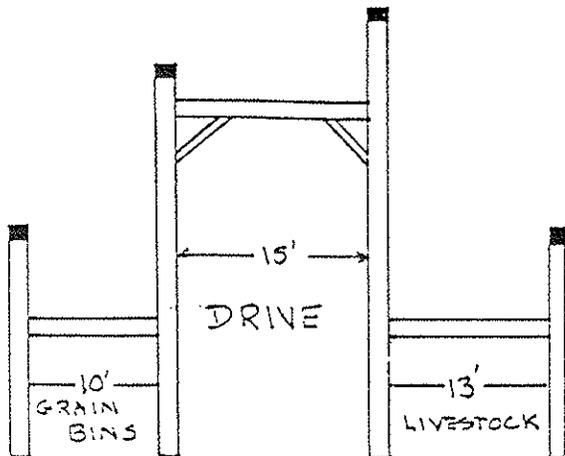
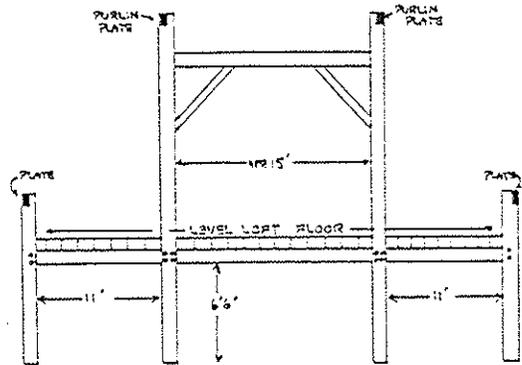
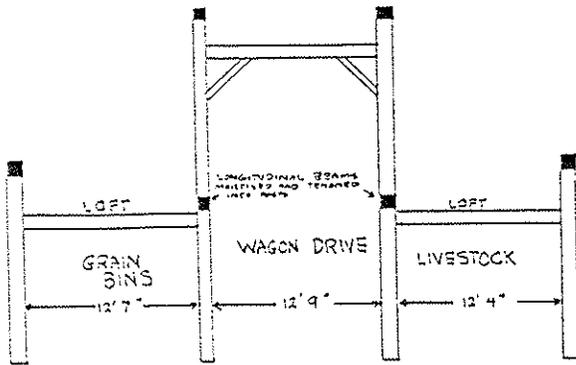


Figure 33 . McMahan Barn ca. 1880. End-opening (longitudinal drive), 3-aisle barn. Hay unloaded from the wagon drive on the interior of barn.

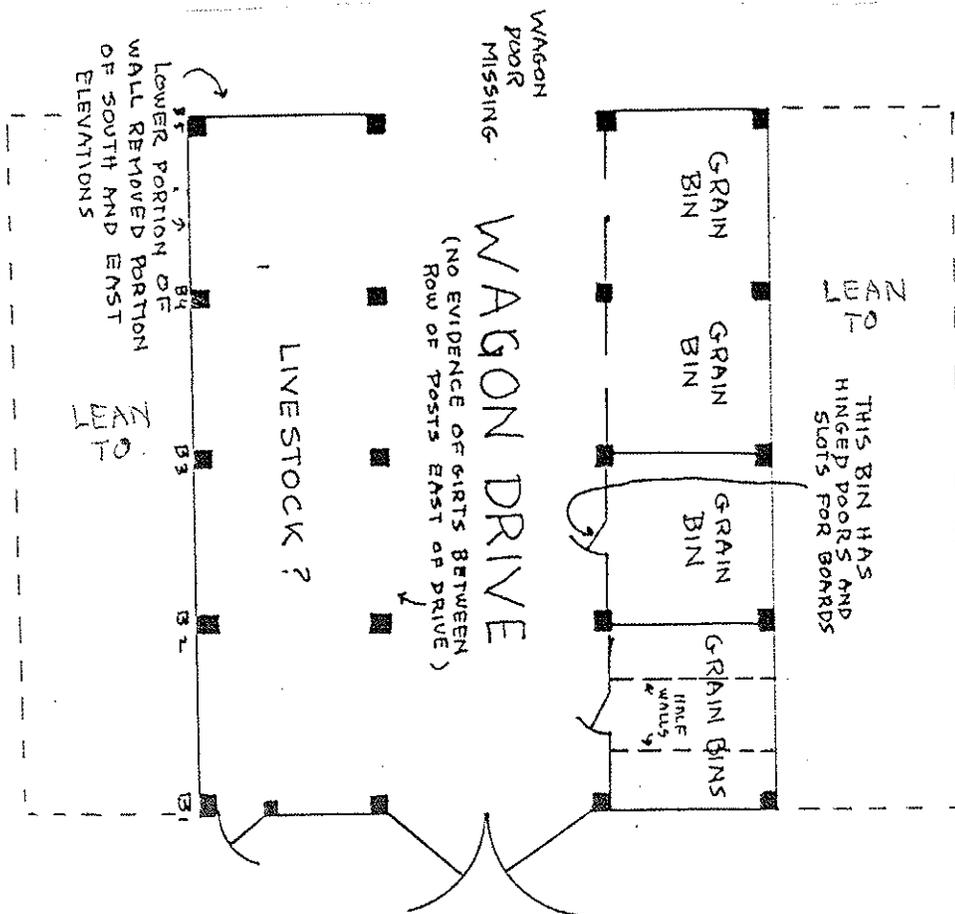
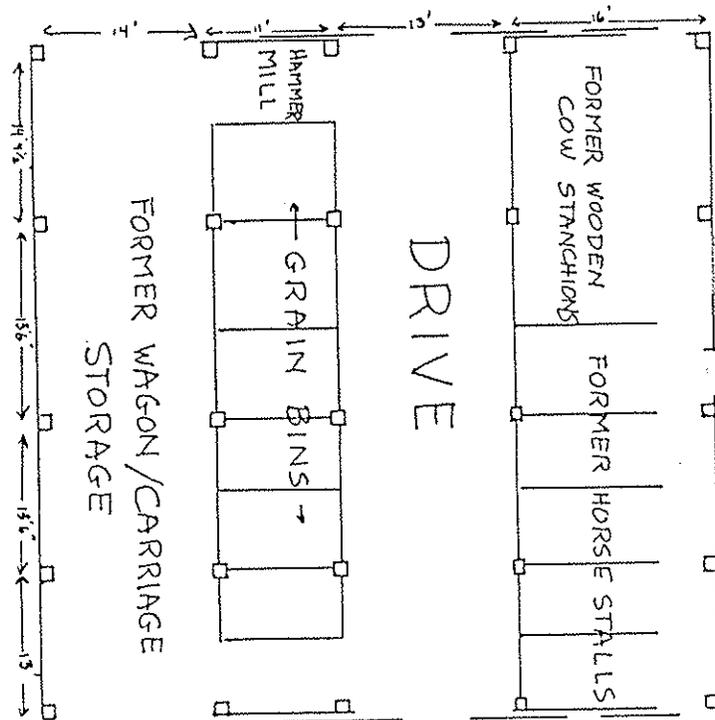
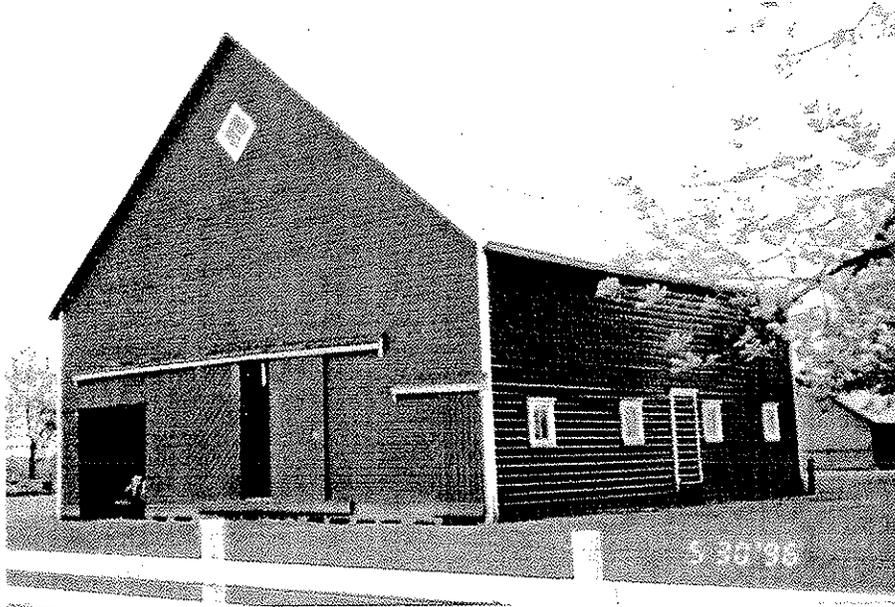


Figure 34. End-opening (longitudinal drive), 4-aisle plan. Hay unloaded from the wagon drive on the interior. McElmurry Barn, ca. 1893. (Not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1871-1899

Figure 35. End-opening (longitudinal drive), 4-aisle plan. Hay unloaded from the wagon drive on the interior. Charles W. Richardson Barn built 1880s or 1890s, bent and plan shown (not drawn to scale).

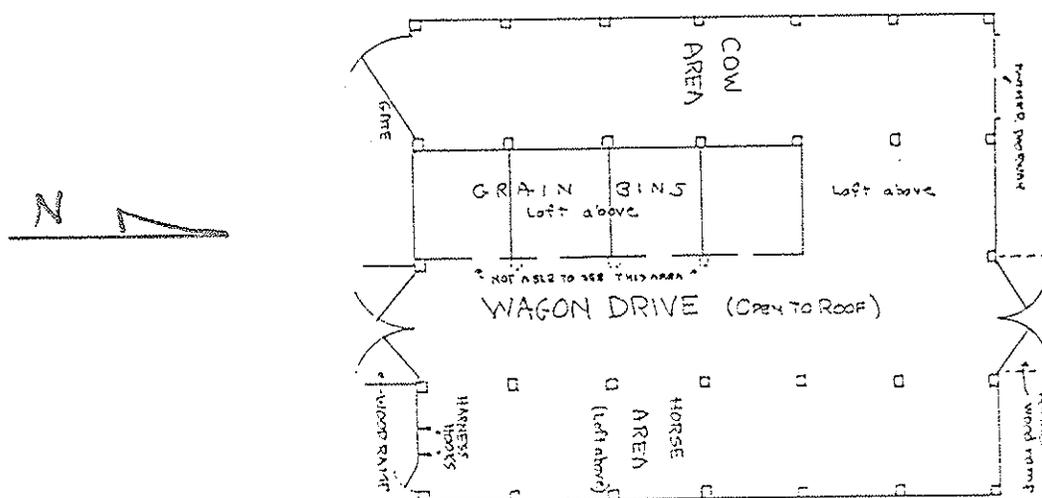
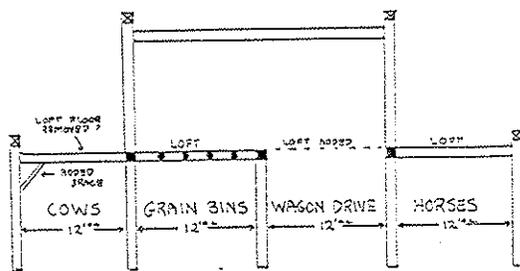
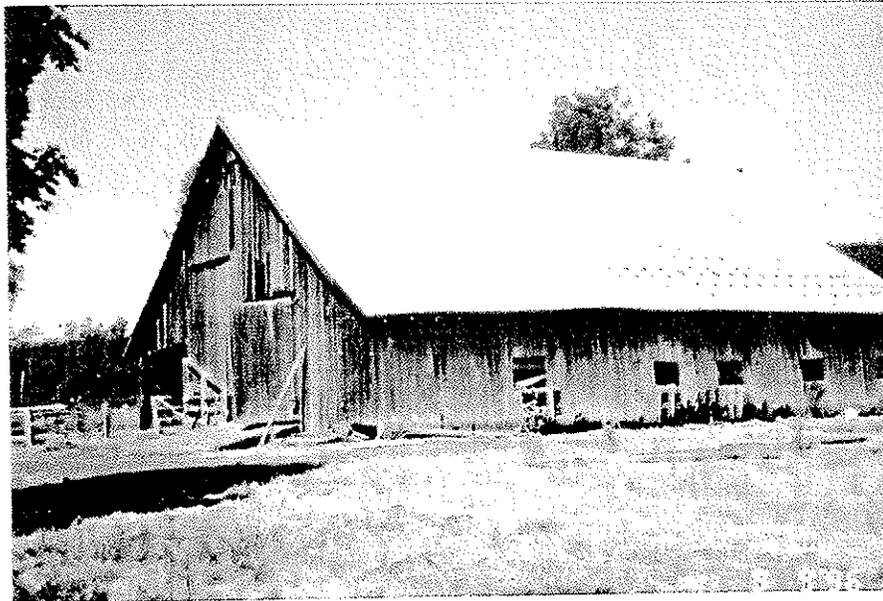


Figure 36. Side-opening (transverse drive), 4-bay plan. Hay unloaded from the wagon drive on the interior. The Warner Barn, ca. 1895, has two drives. (Not drawn to scale.)

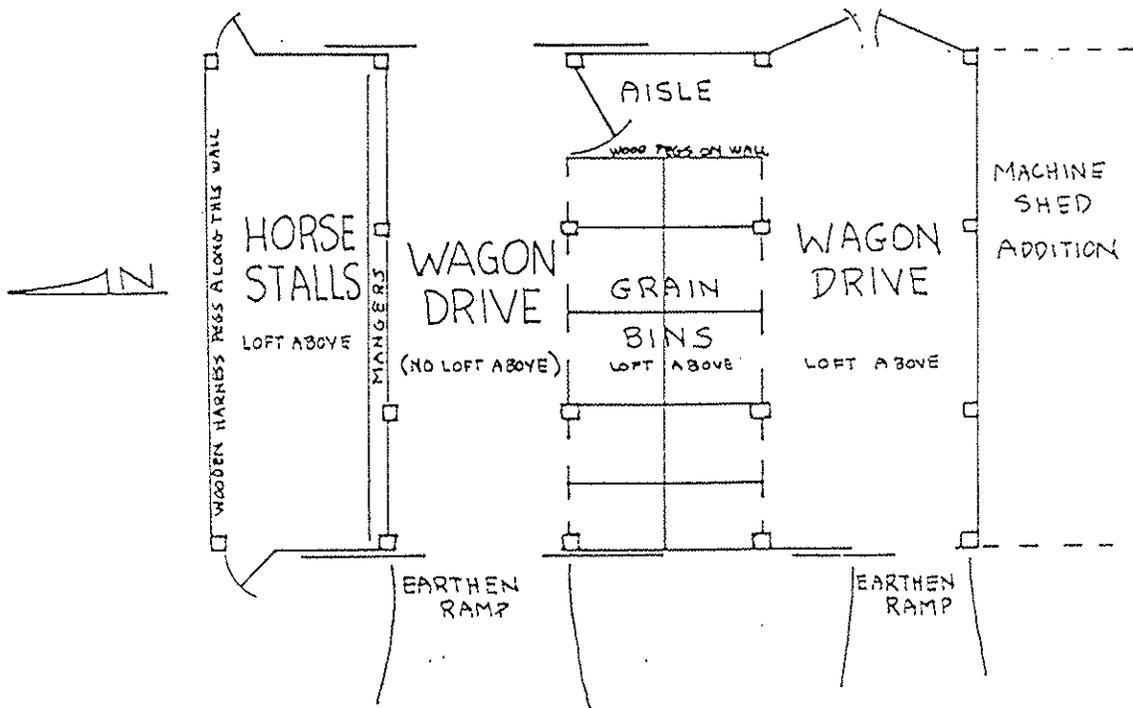
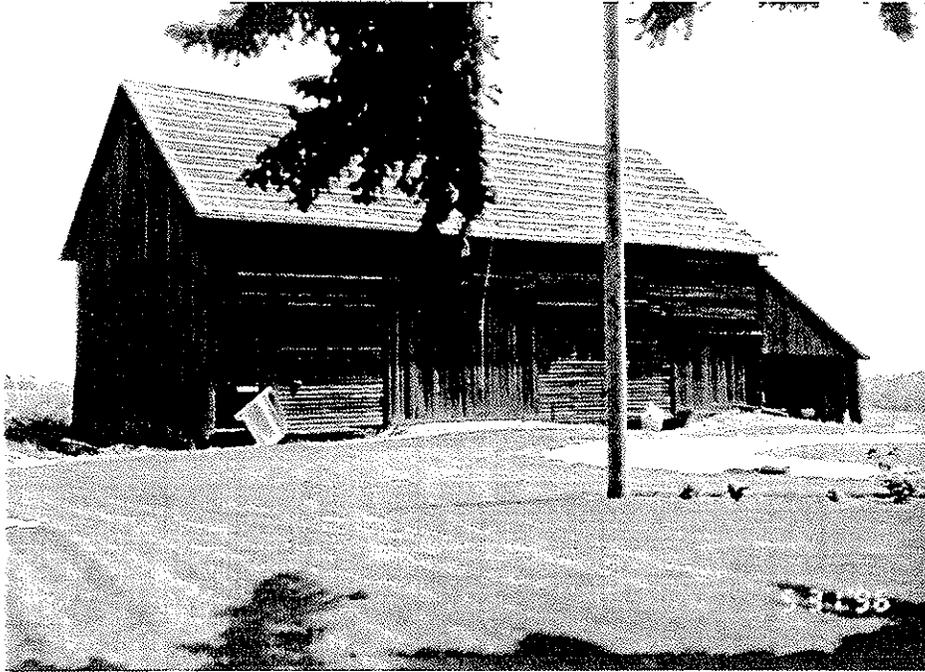


Figure 37. Side-opening (transverse drive), 5-bay plan. Hay unloaded from the wagon drive on the interior. The Cannon Barn 1890s?. (Not drawn to scale.)

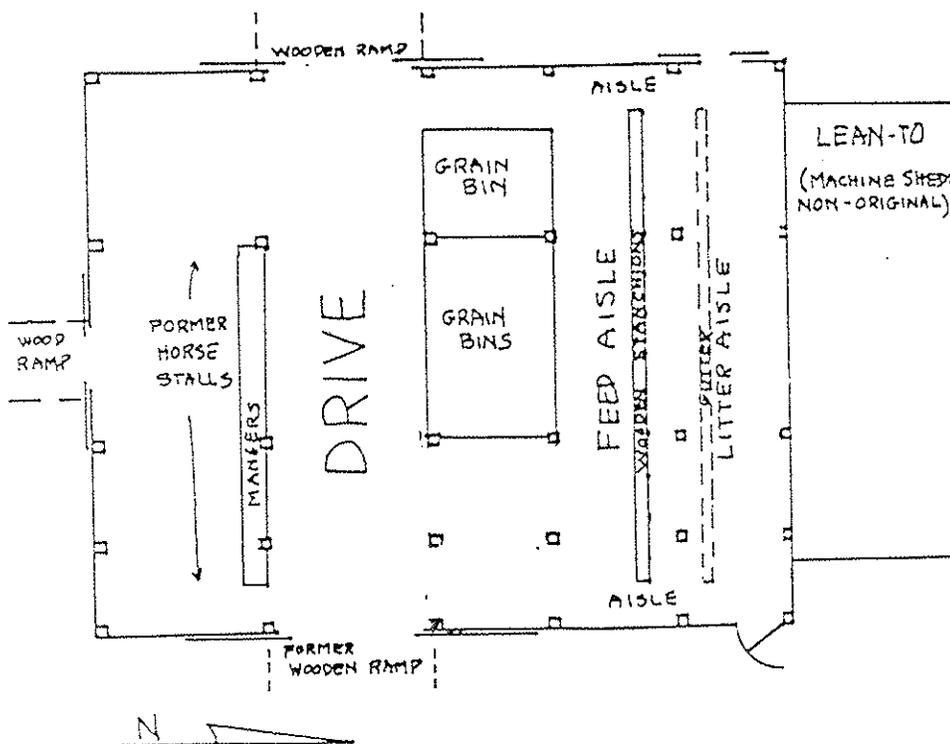
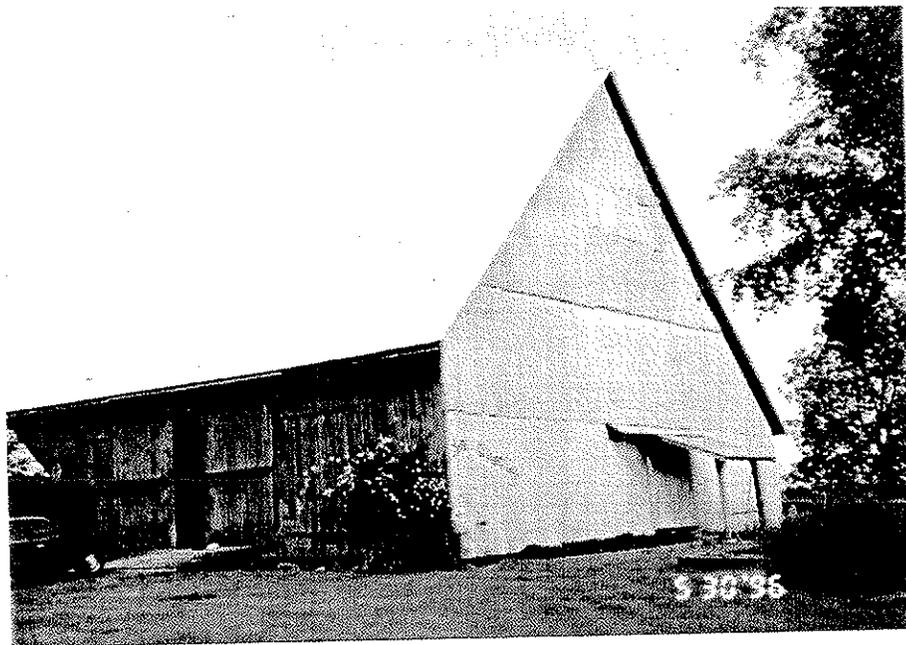


Figure 33. Top: The Bond Barn built in 1883. Bottom: Timber truss roof of the Bond Barn.

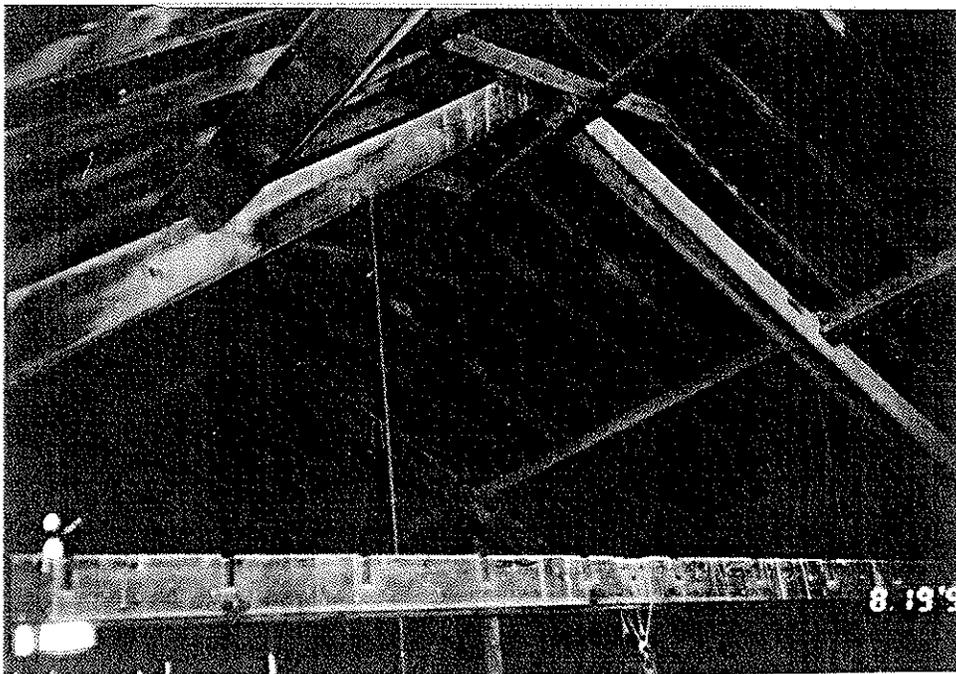


Figure 39. The Hulburt Barn.

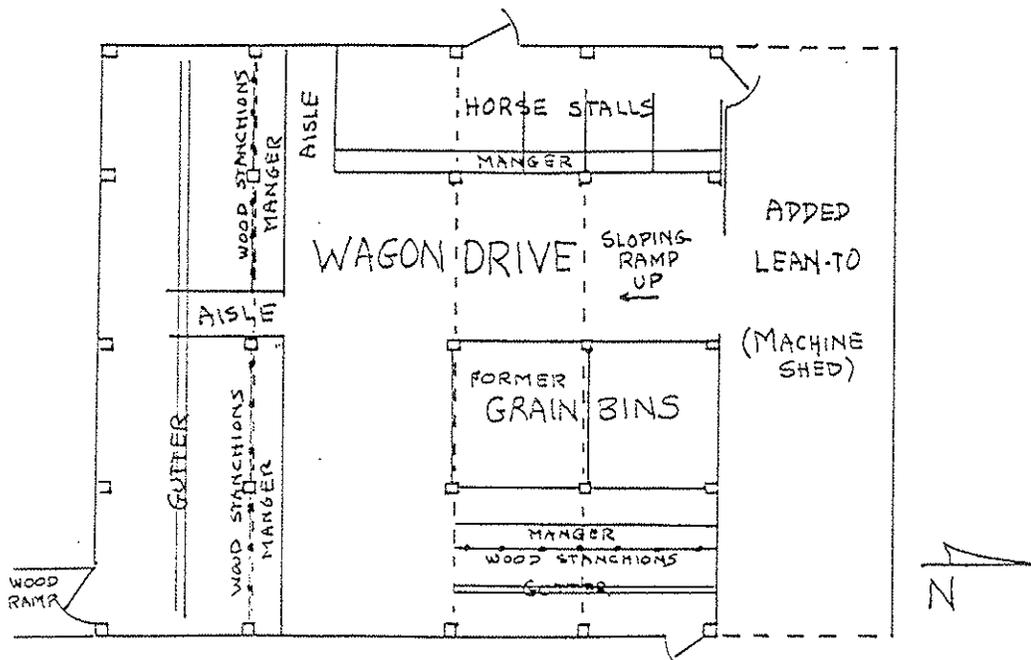
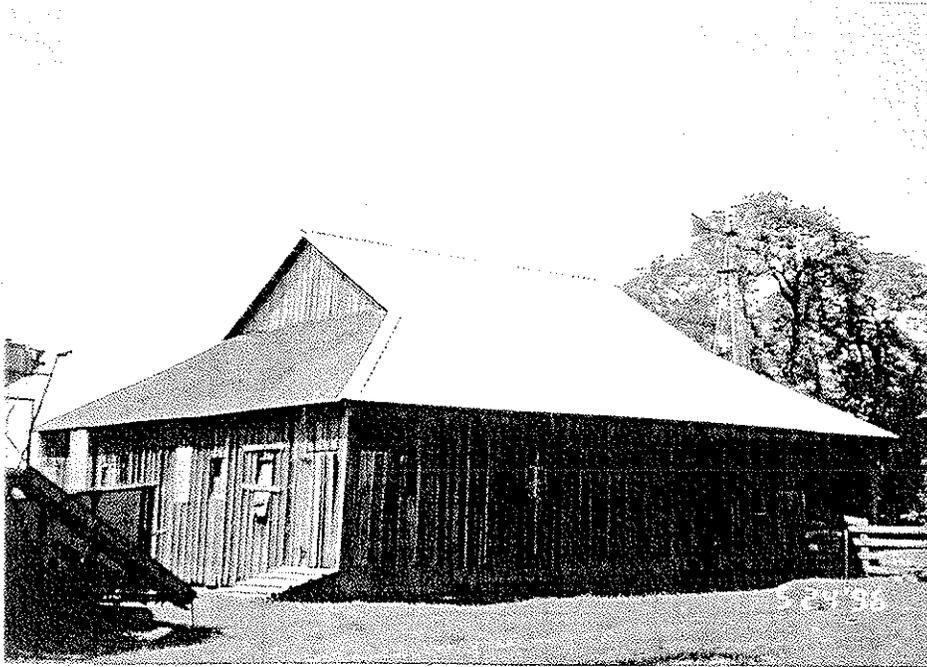


Figure 40 . The J.A. Smith Barn cornerboards and cantilevered gable siding.

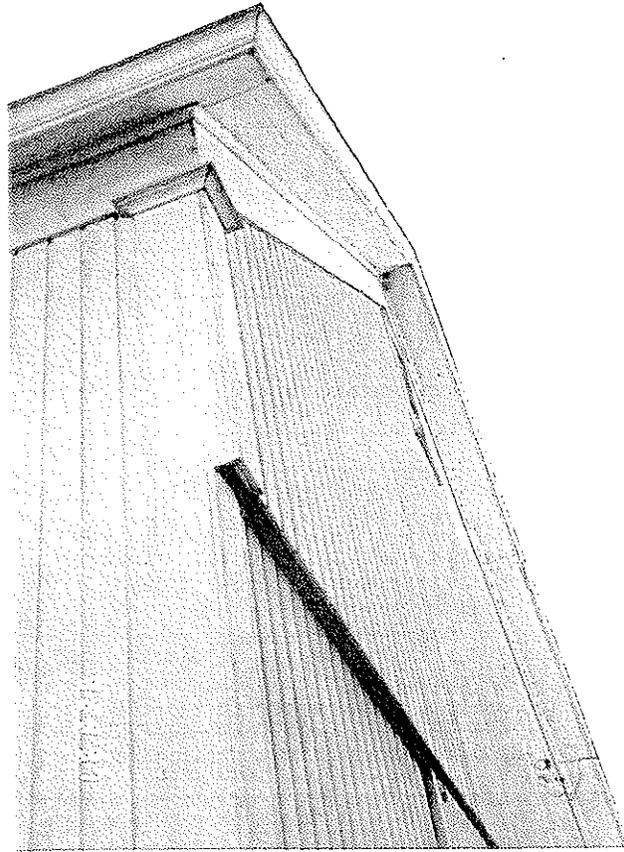
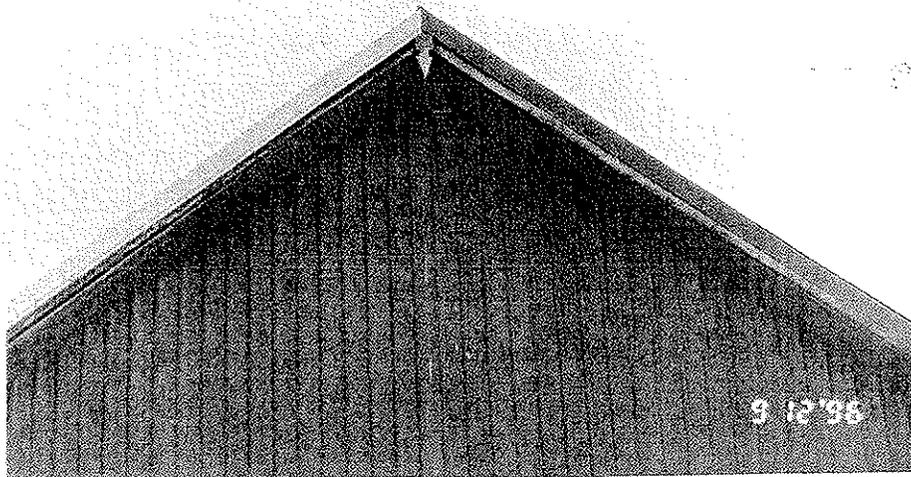


Figure 41 . Remnant gable ornament on the Morgan Barn.



BARN DESIGN AND CONSTRUCTION, 1871-1899

Figure 42a. Roller doors illustrated in lithograph (Williams 1878).

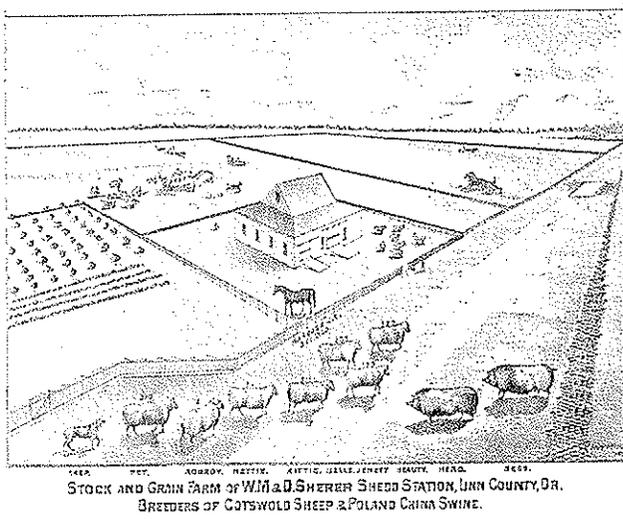


Figure 43. Louvered vent in the Milhollen Barn.



Figure 44. Stanchions in the 1884 Cyrus Barn.

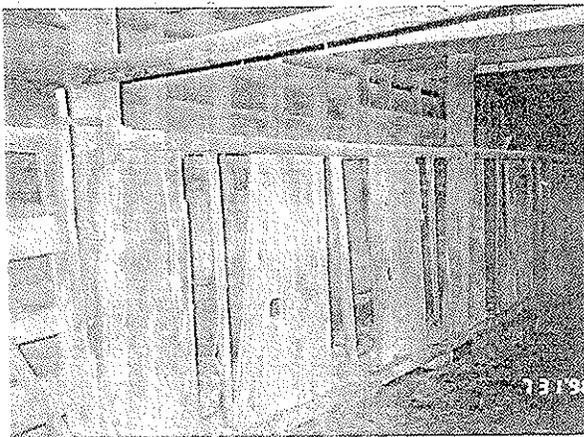
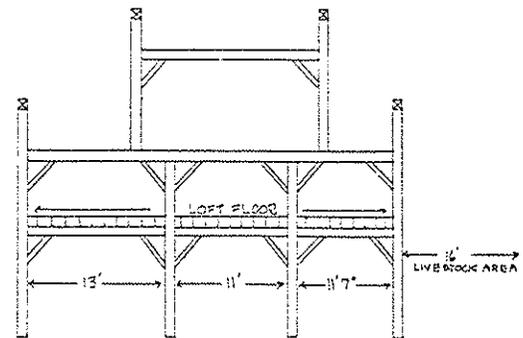
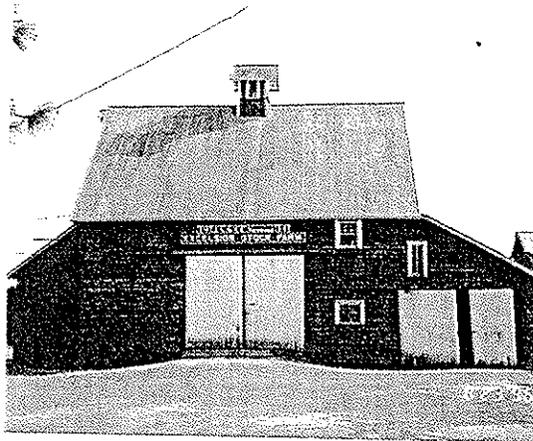
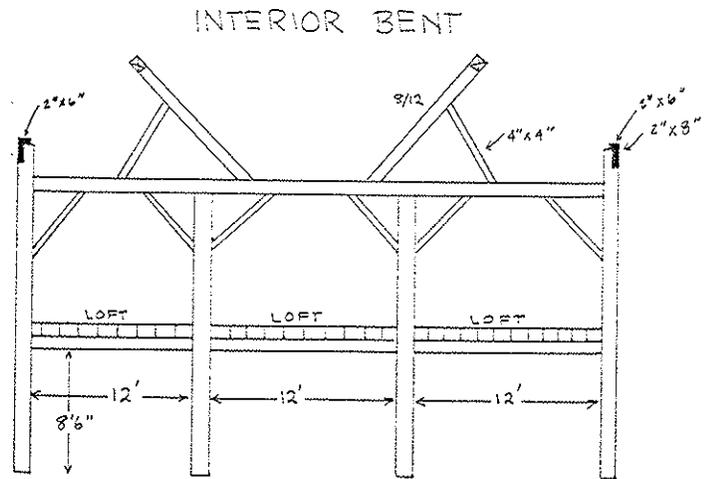
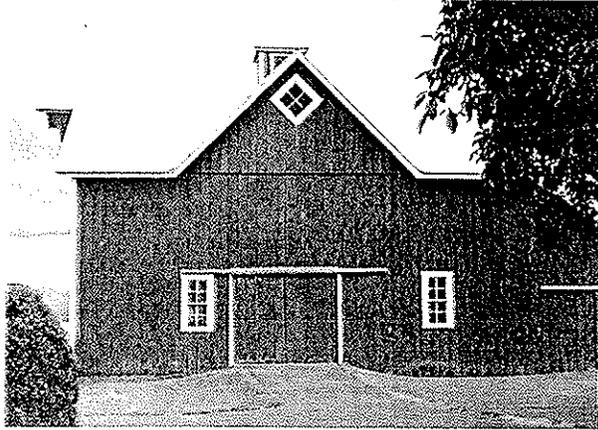
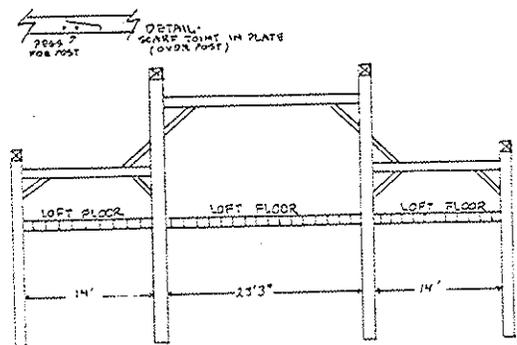
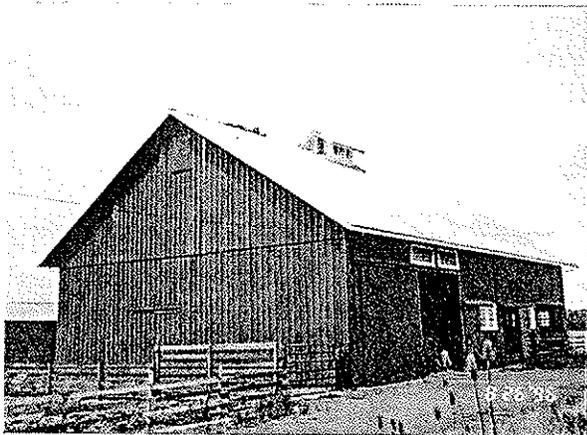
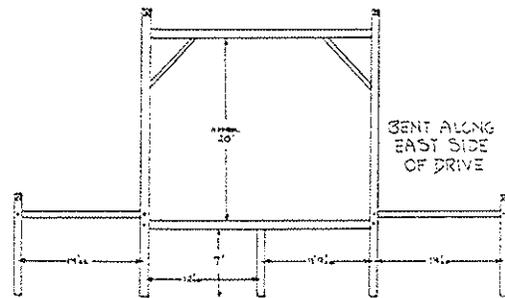
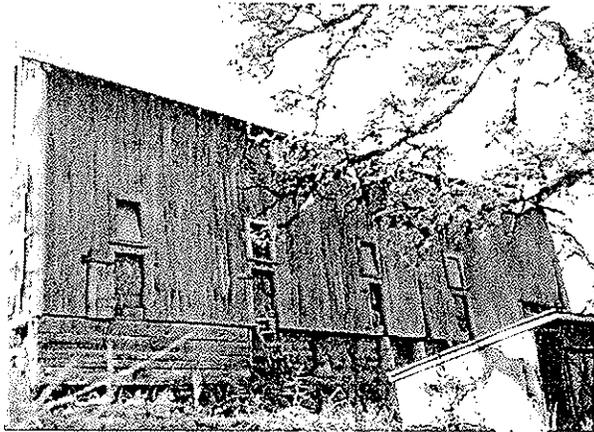


Figure 46. Examples of timber frame barn bents with secondary posts to purlin plate. Top: The Buchner Barn, 1909 has canted purlin posts; bottom: The Nicewood Barn, 1914, has upright purlin plate posts. (Not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 47. Examples of timber frame barn bents with a post to purlin plate configuration. **Top:** The Frank Habermann Barn, ca. 1910. **Bottom:** The Kelly Barn, 1913. (Not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 43 . Bents suggestive of Wing's joist frame using timbers rather than plank dimension lumber. Wing's joist frame was designed to do away with tie beams which interfered with the operation of the hayfork. **Top:** the Jones Barn, ca. 1900; **center:** the Schindler Barn ca. 1910; **bottom:** the Manis Barn, ca. 1910s (basement level not drawn). (Not drawn to scale.)

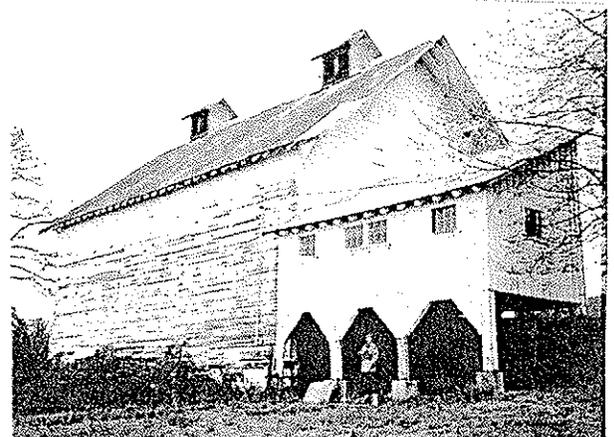
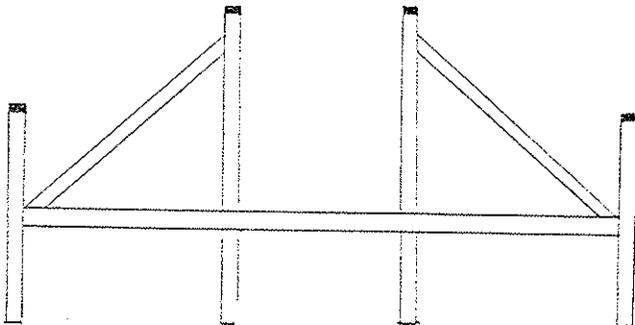
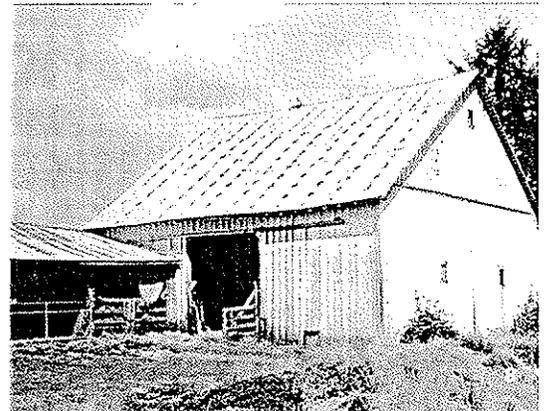
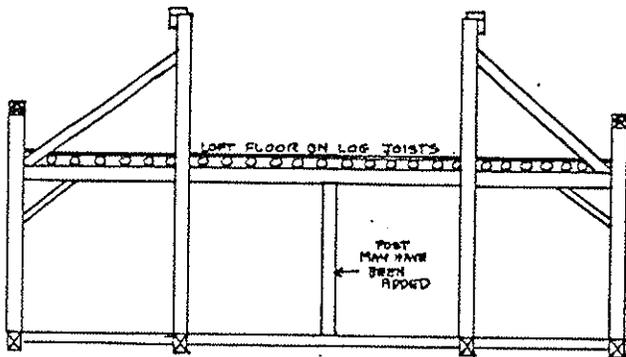
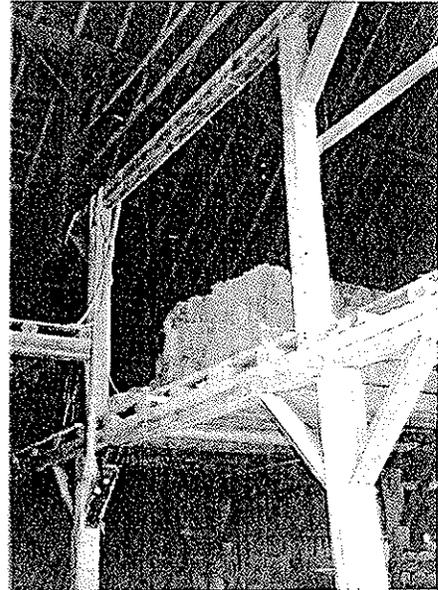
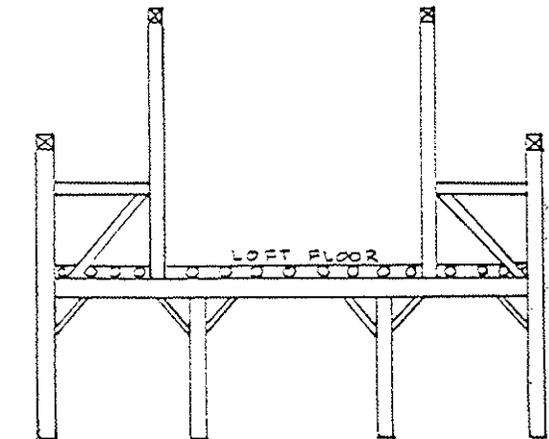
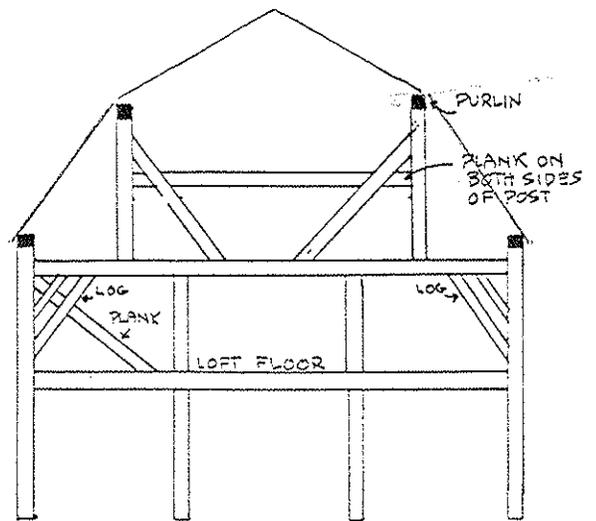
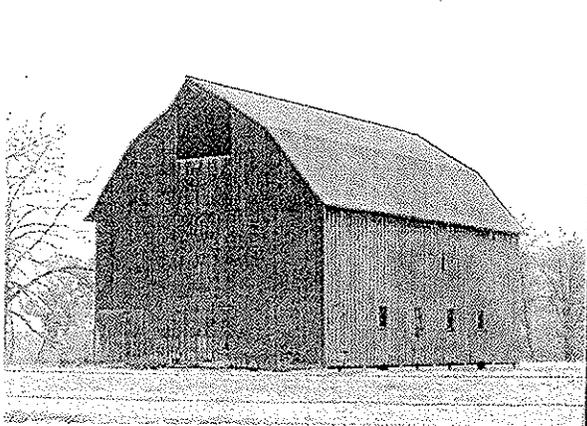
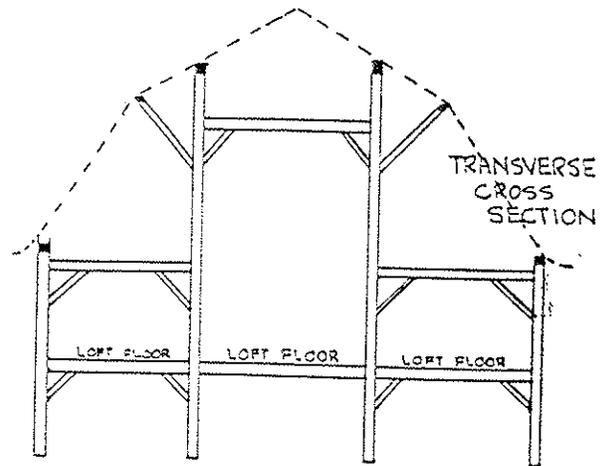
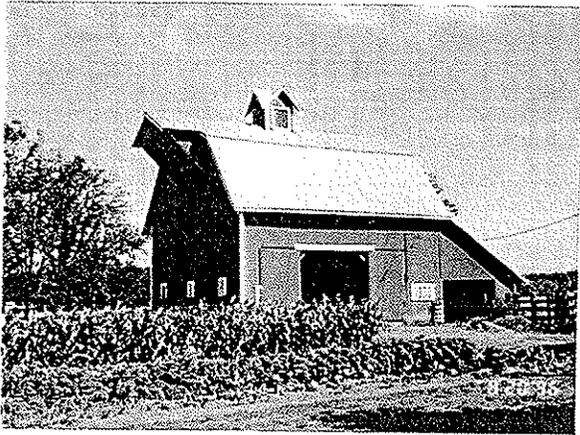
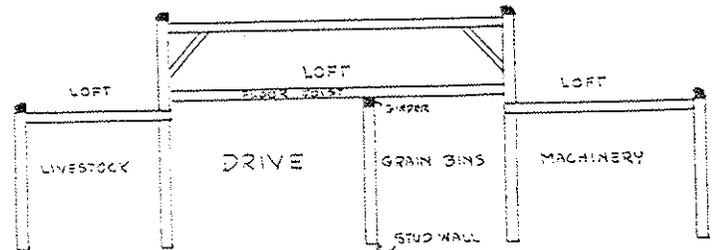
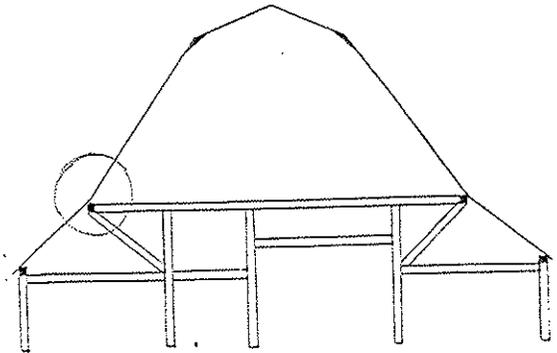
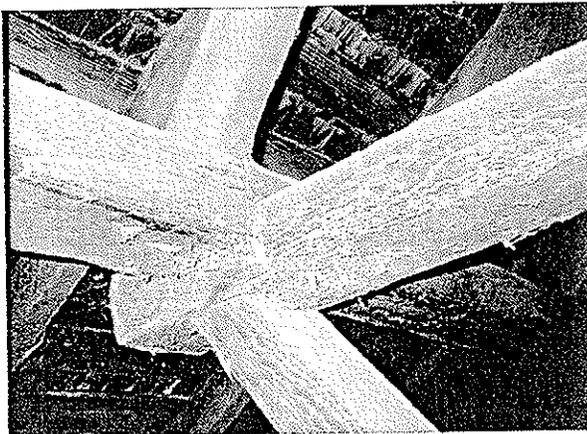
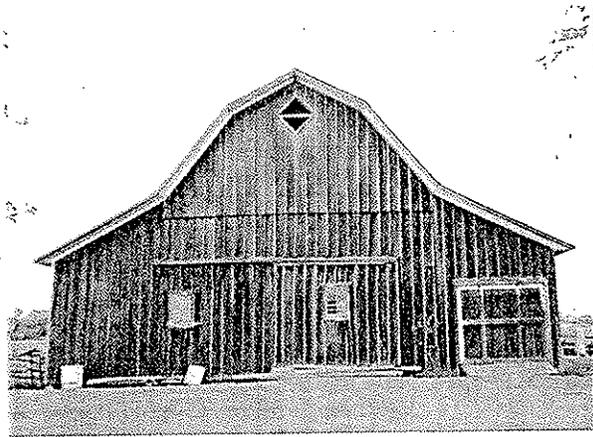


Figure 49. Bents for timber frame barns with gambrel roofs. Top: the Jackson Barn, ca. 1910. Bottom: the Felzer Barn ca. 1910. (Not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 50. Bents for timber frame barns with self-supporting gambrel roofs. **Top and Center:** The Krabill Barn, ca. 1915. The Krabill Barn was built by Christian Kennel, a Mennonite barn builder who emigrated from Canada in the 1890s. **Bottom:** The Cox Barn ca. 1910. (Not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 51. Three-level barns. **Top:** The Hoefer Barn, a three-level barn built in ca. 1915, has a timber frame with mortise and tenon joinery and a braced rafter roof. The second level, which is accessed by a ramp within the barn, was used to house sheep. **Bottom:** The Anthony Barn built in ca. 1912.

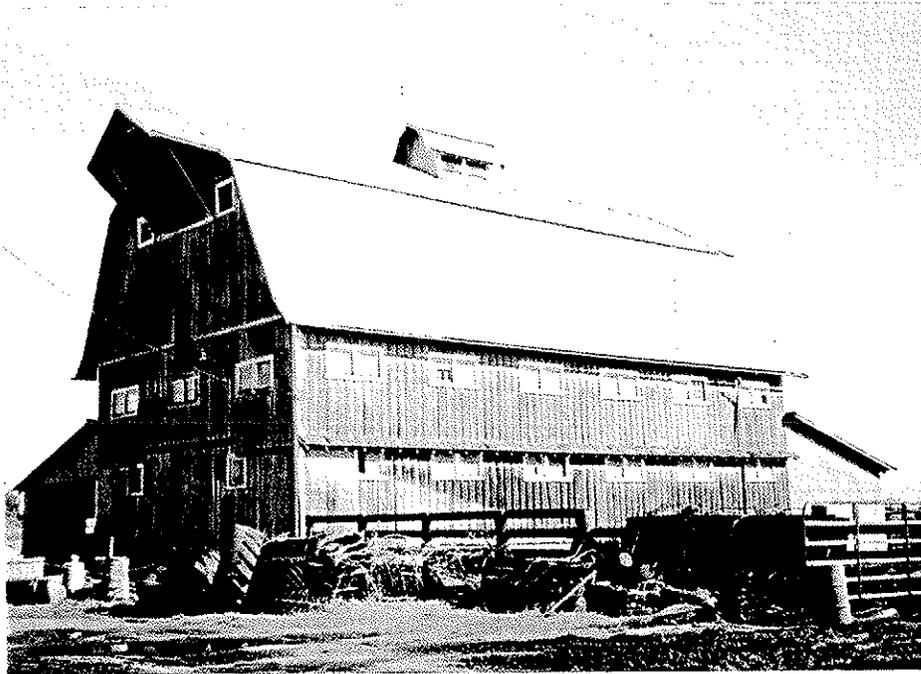
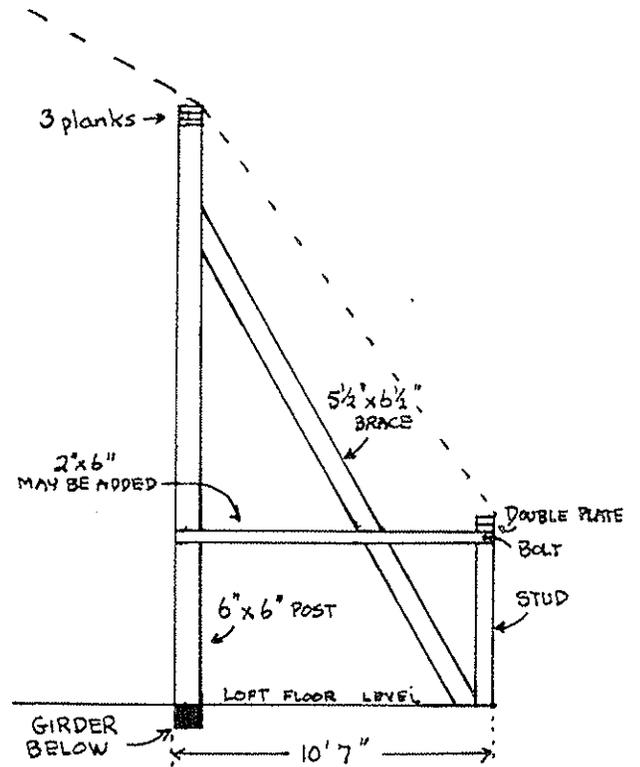
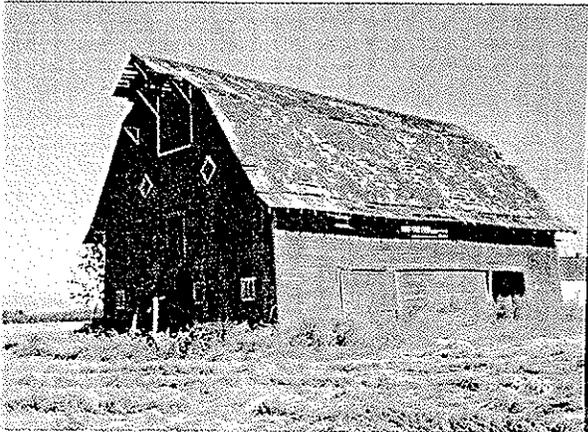
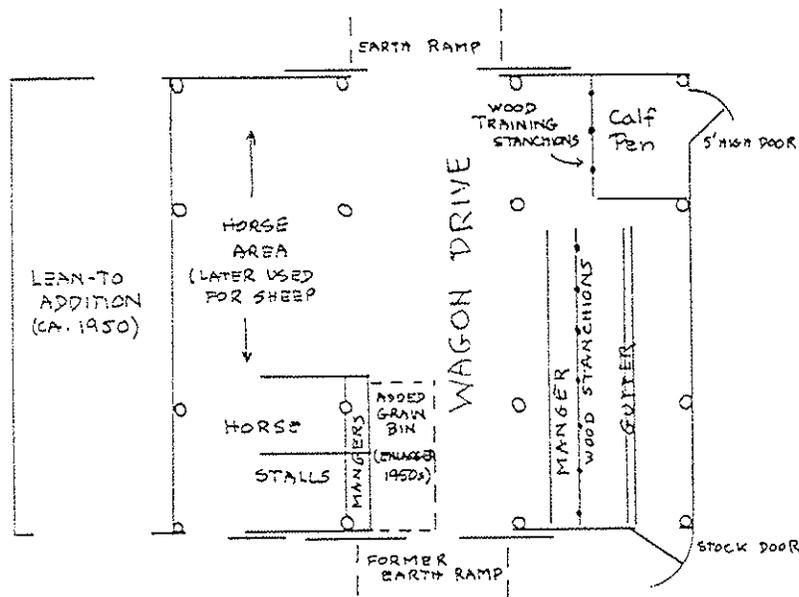
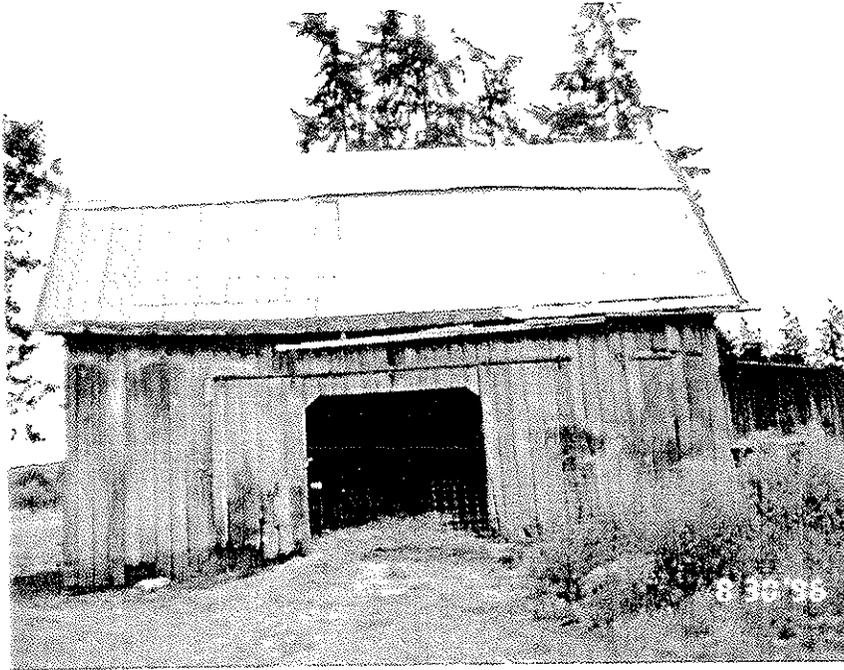


Figure 52. Gambrel-roofed barn with stud wall construction and timber purlin posts. The Kelly Barn built in ca. 1910.



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 53. Transverse drive, three-bay plan. The Hassler Barn, is 36' x 42' pole barn with mortise and tenon joinery secured by spikes. The gambrel roofed barn is estimated to have been built in the 1910s. Hay is unloaded from the exterior of the barn. (Not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 54. Transverse drive, four-bay plan. The Grell Barn, built in 1916 is 40 by 66 feet and has a sawn timber frame with mortise and tenon joinery. (Not drawn to scale.)

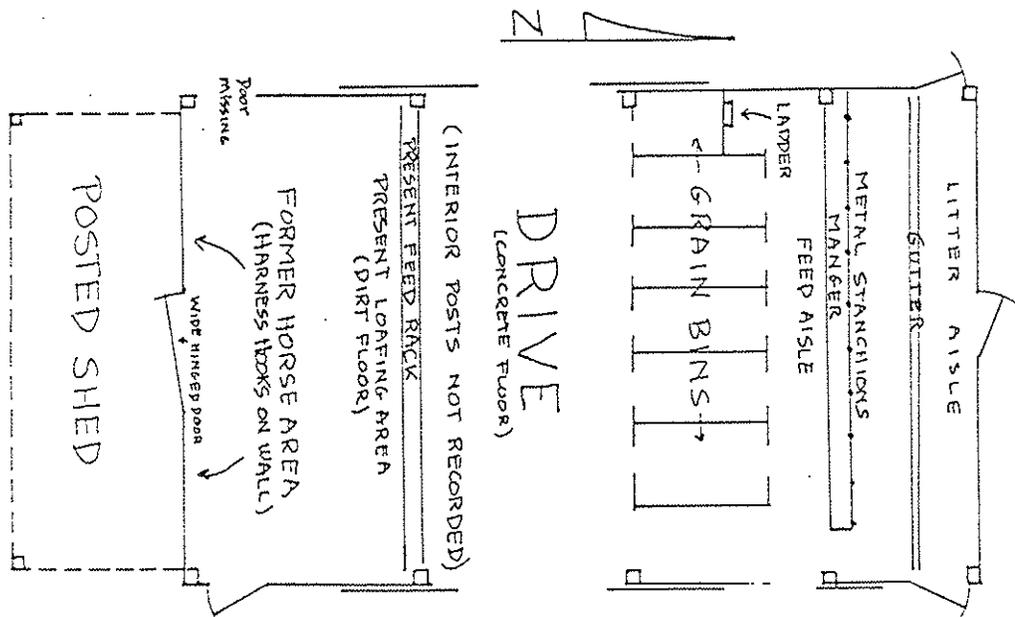
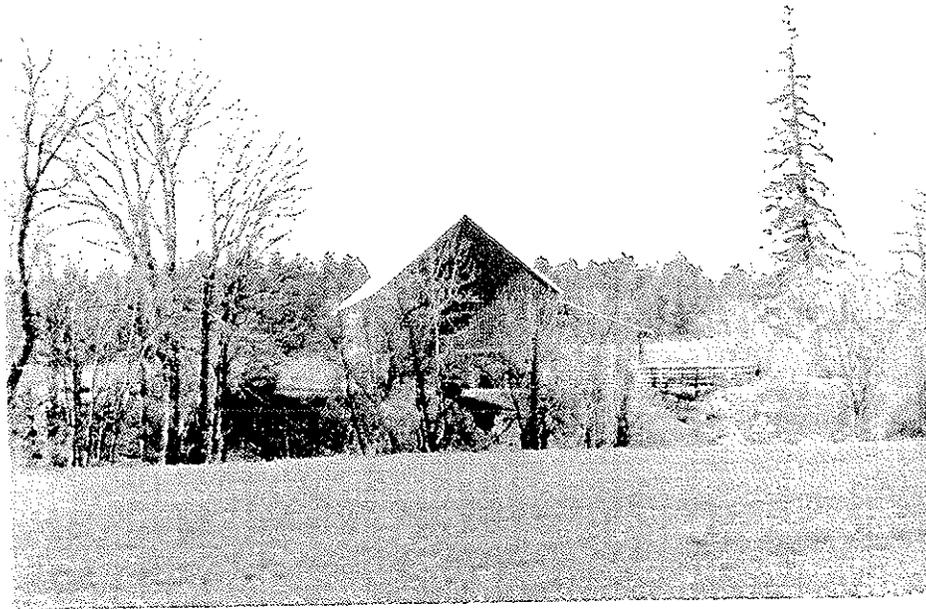
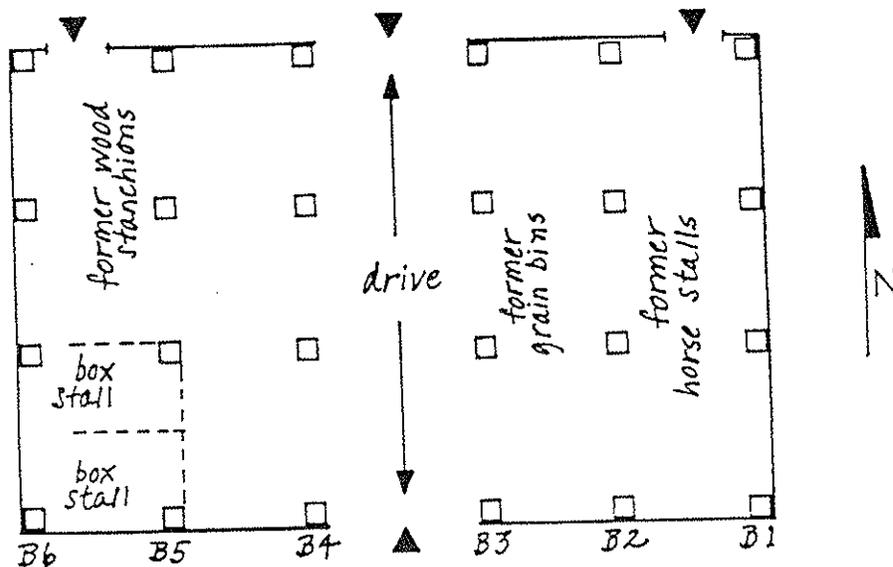


Figure 55. Side-opening, transverse drive, five-bay plan. The Jones Barn, ca. 1900, has a hewn timber frame. Hay was unloaded from the wagon drive on the interior. (Not drawn to scale.)



(Bays are approximately 13' E-W.)



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 56. Side-opening, transverse drive, six-bay plan. The Sandner Barn, built in 1911-12, is 44½' x 71' and has a sawn timber frame with mortise and tenon joinery. (Not drawn to scale.)

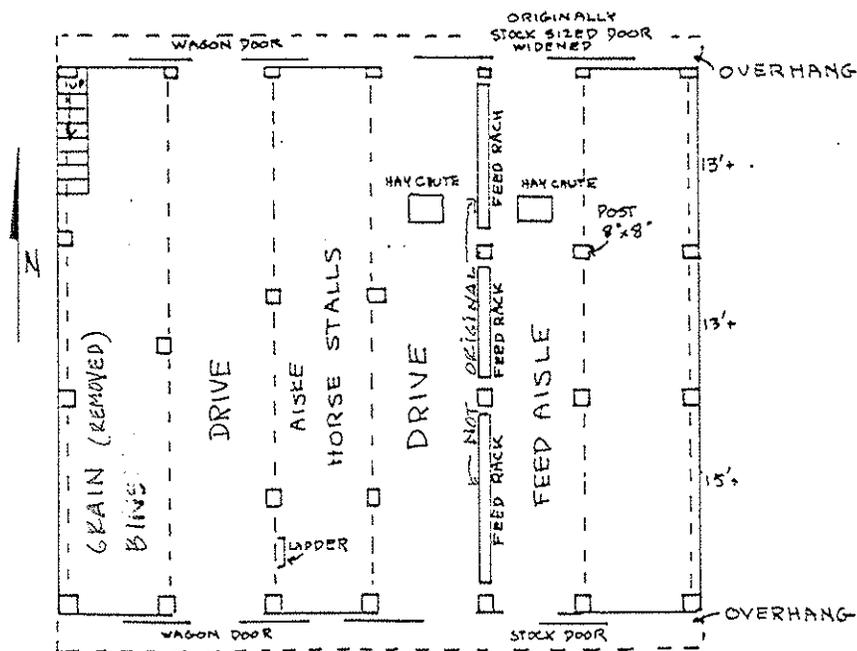


Figure 57. Longitudinal drive, three-aisle plan. The Riley Barn, built in 1912, is 40' x 60' with a balloon frame. (Not drawn to scale.)

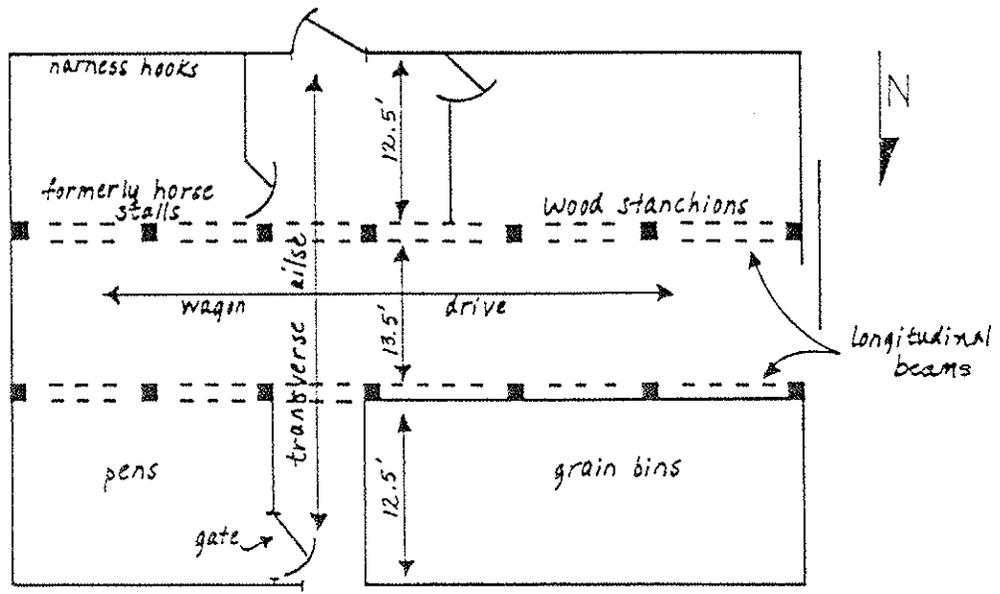
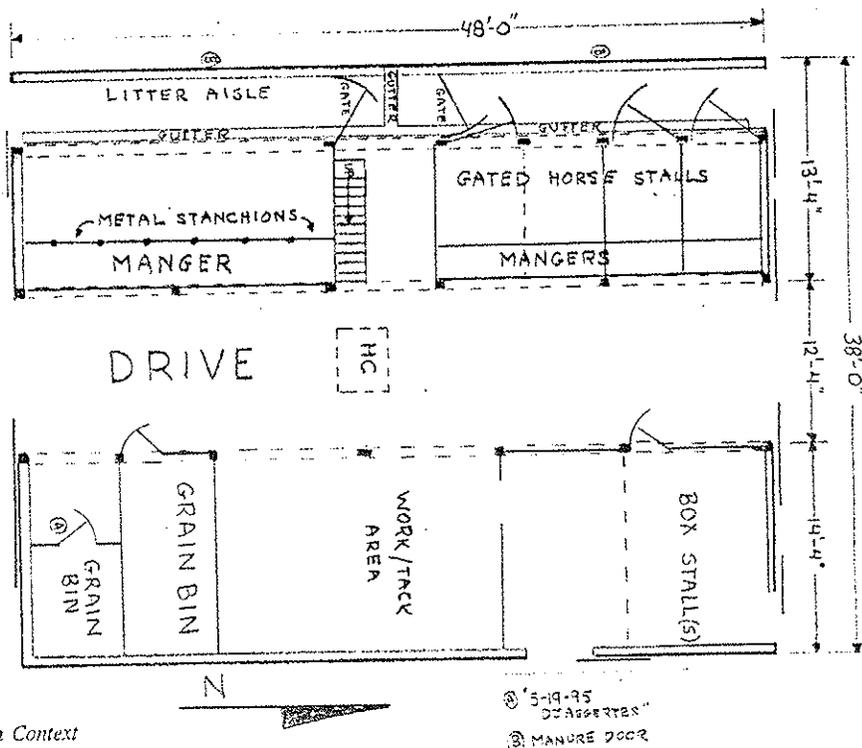
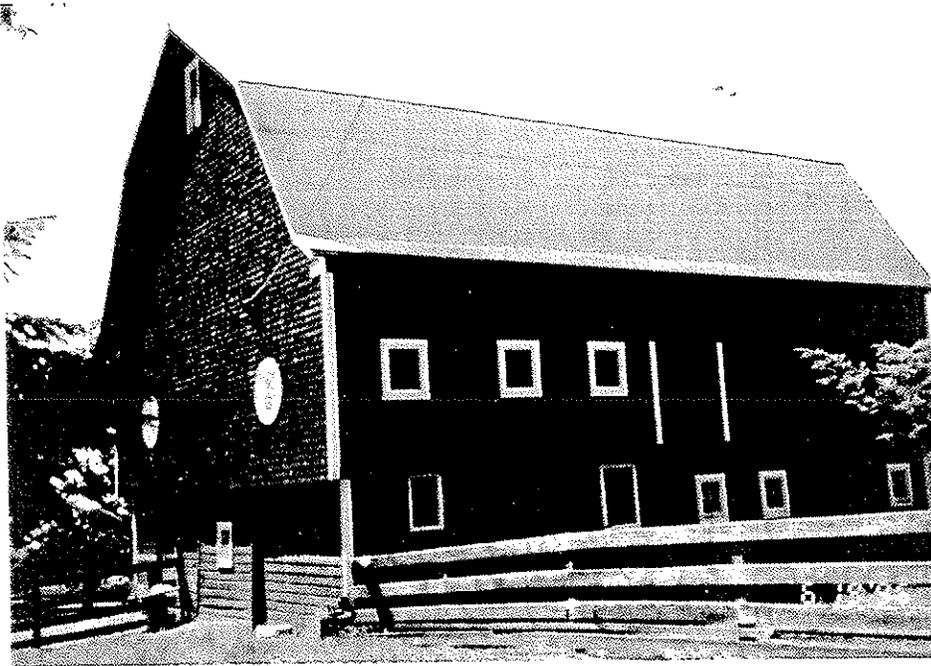


Figure 58. Longitudinal drive, three-aisle plan. The Aegerter Barn, built in 1915, is 38' x 48' with a platform frame and a Shawver truss. Hay unloaded on the exterior. The four-sided overhang is unique in Linn County. (See section on ethnic barns.)



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 59. Bank barn with longitudinal drive, three-aisle plan. The Manis Barn built in 1910s (estimated), has a sawn timber frame with mortise and tenon joinery. Cow stanchions on the lower level with interior wood stave silo extending from basement to loft. (Plan not drawn to scale.)

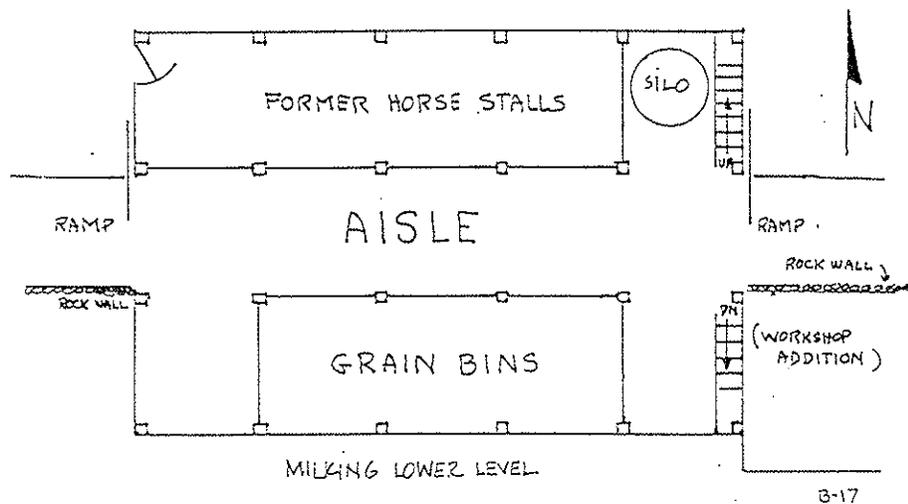
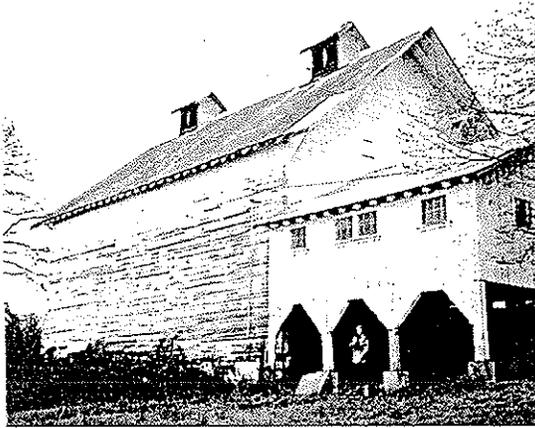


Figure 60. Longitudinal drive, four-aisle plan. The Krabill Barn, built in ca. 1915, has a sawn timber frame with mortise and tenon joinery. (Plan and bent not drawn to scale.)

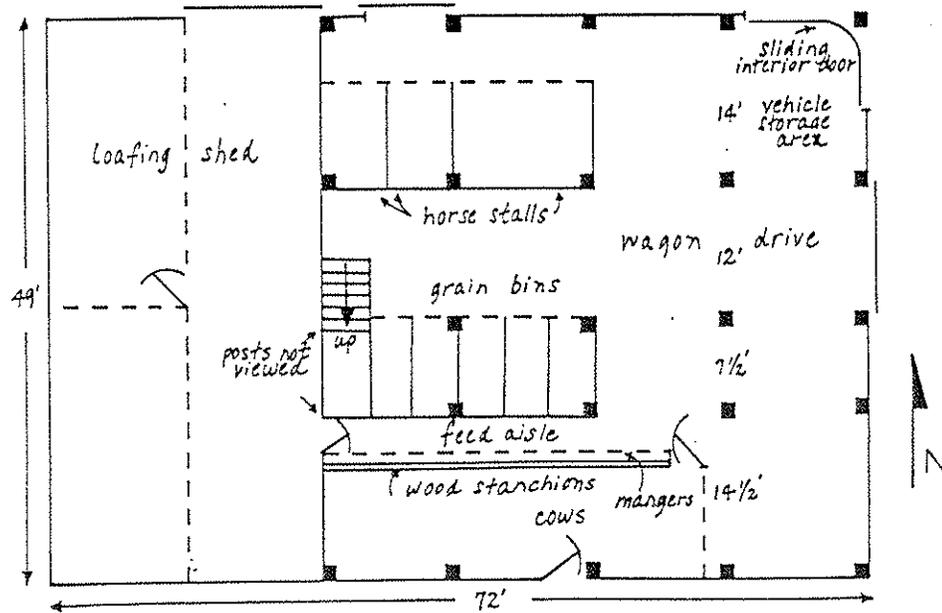
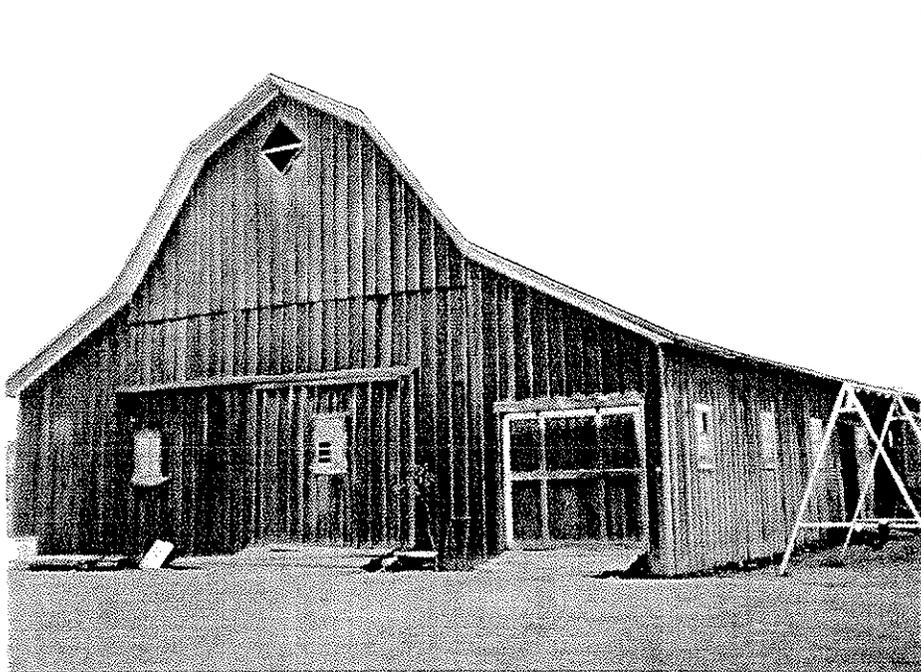
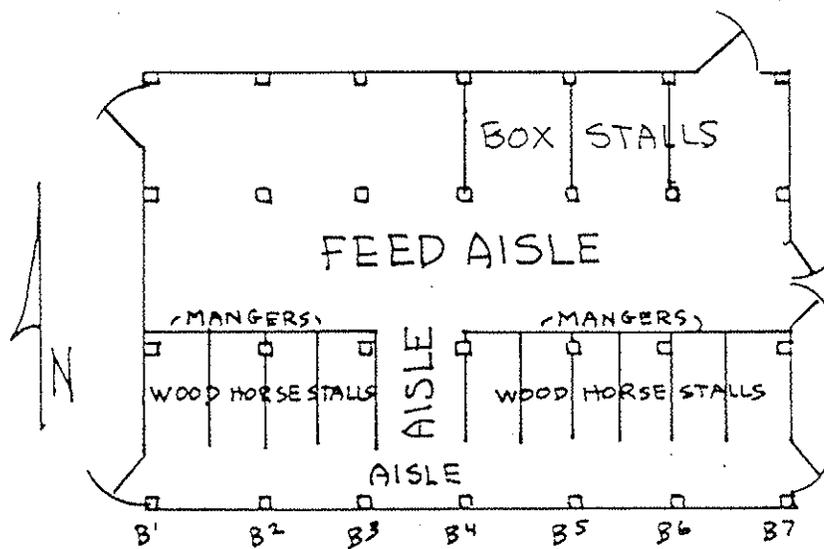
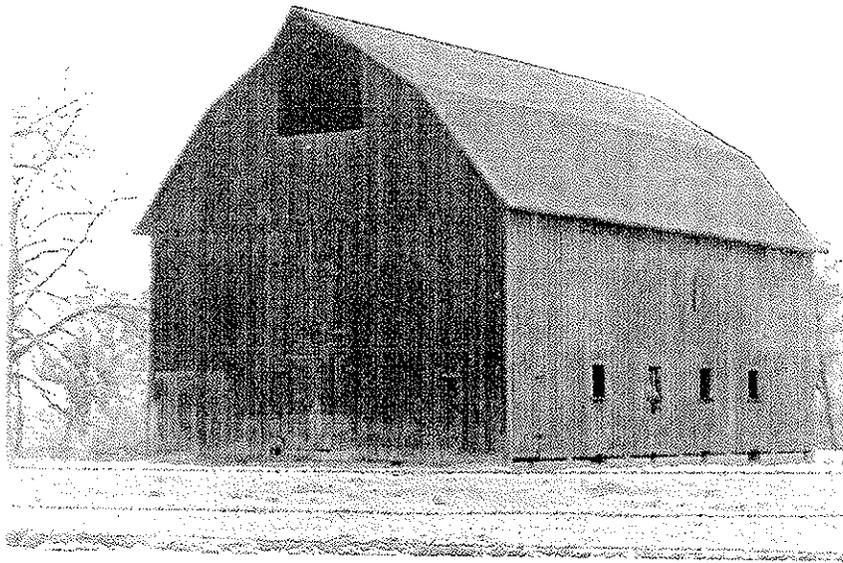


Figure 61. Longitudinal feed aisle plan (feed aisle supplants wagon drive). The Felzer Barn, probably built in ca. 1910, is 40' x 60' and has a sawn timber frame with mortise and tenon joinery. (Plan not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 62. Feeder Barn. The Dozler Barn, estimated to have been built in the 1910s, is 50' x 60' and has a sawn timber frame with mortise and tenon joinery. (Plan not drawn to scale.)

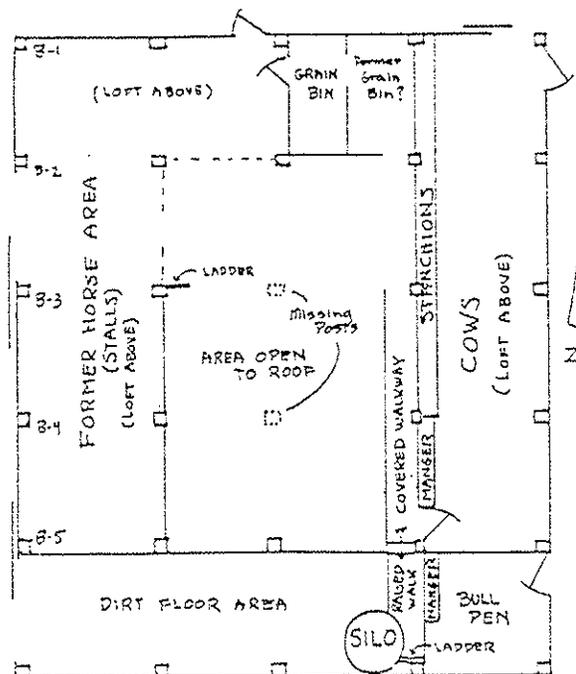
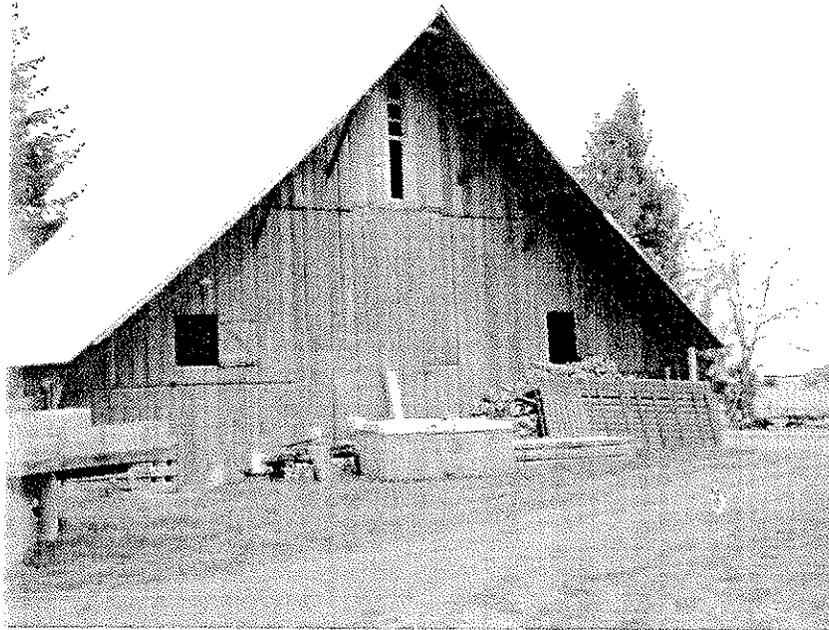
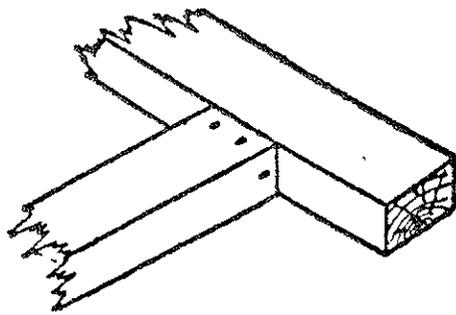
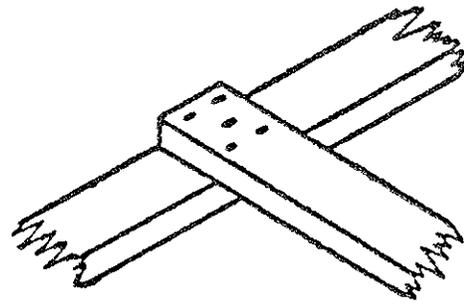


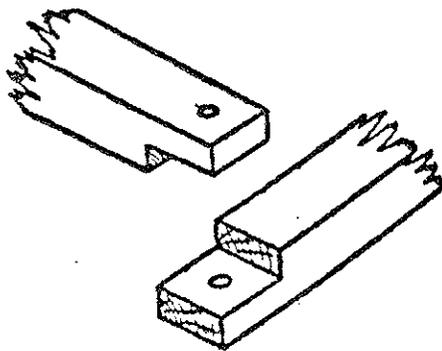
Figure 63. Joints (from Roberts, 1918).



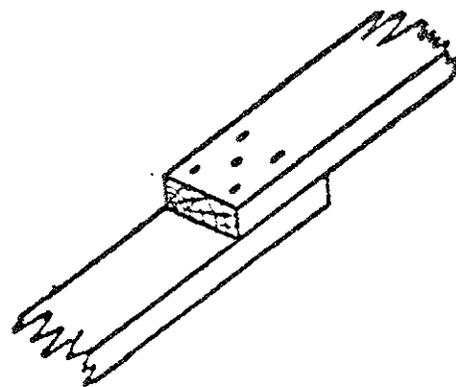
Upper left: Butt joint.



Upper right: Lap joint.



Lower left: Halved lap joint.



Lower right: Simple splice.

BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 64 . Let in joint and toe-nailed brace.

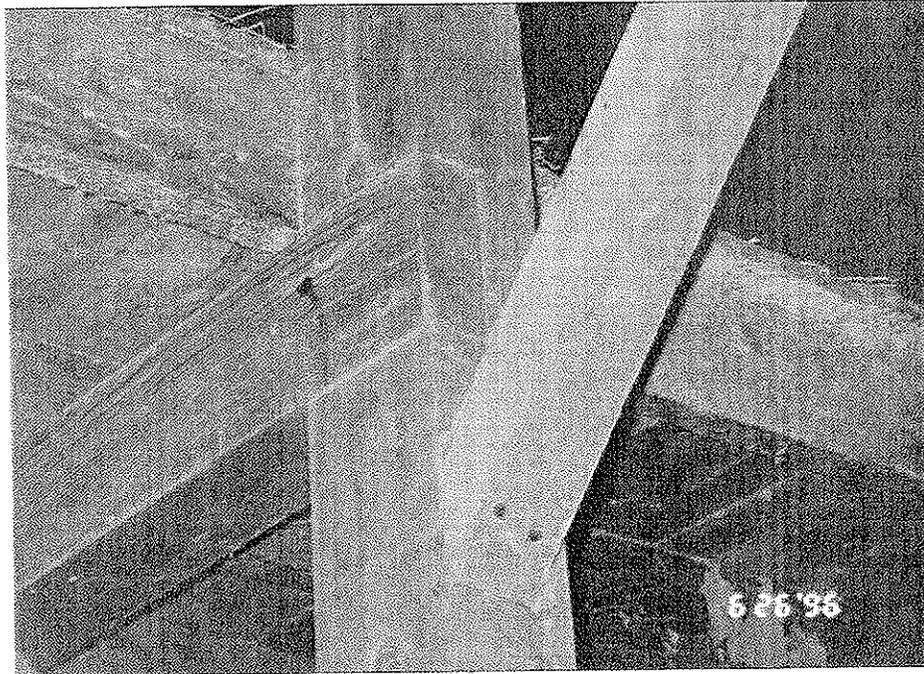


Figure 65 . Pole construction with mortise and tenon joinery. The Leffler Barn ca. 1905.

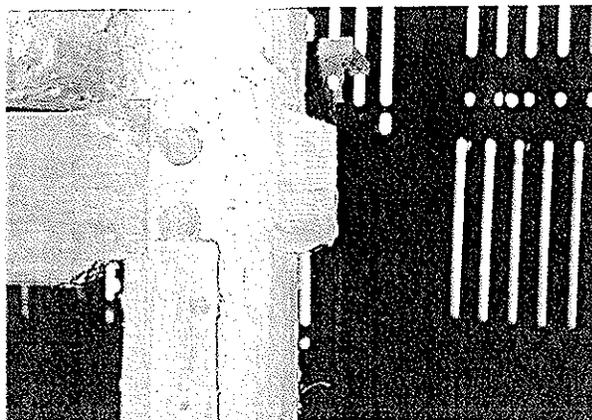


Figure 66 . Metal stanchions lined with wood in the Aegerter Barn.

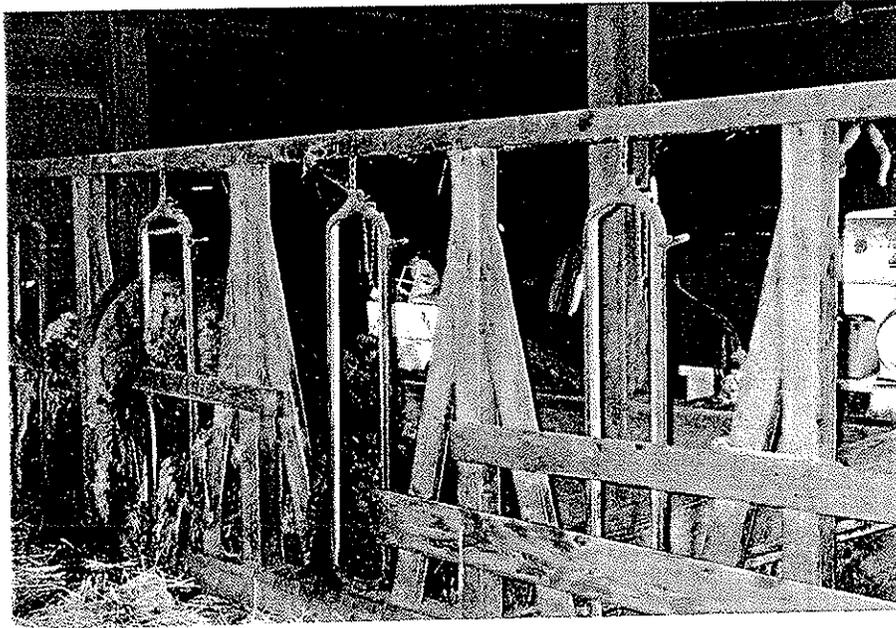


Figure 67 . Feed Carrier in the Baker Barn. This was the only feed carrier still in place in a Linn County Barn although tracks were seen in two other Linn County Barns.

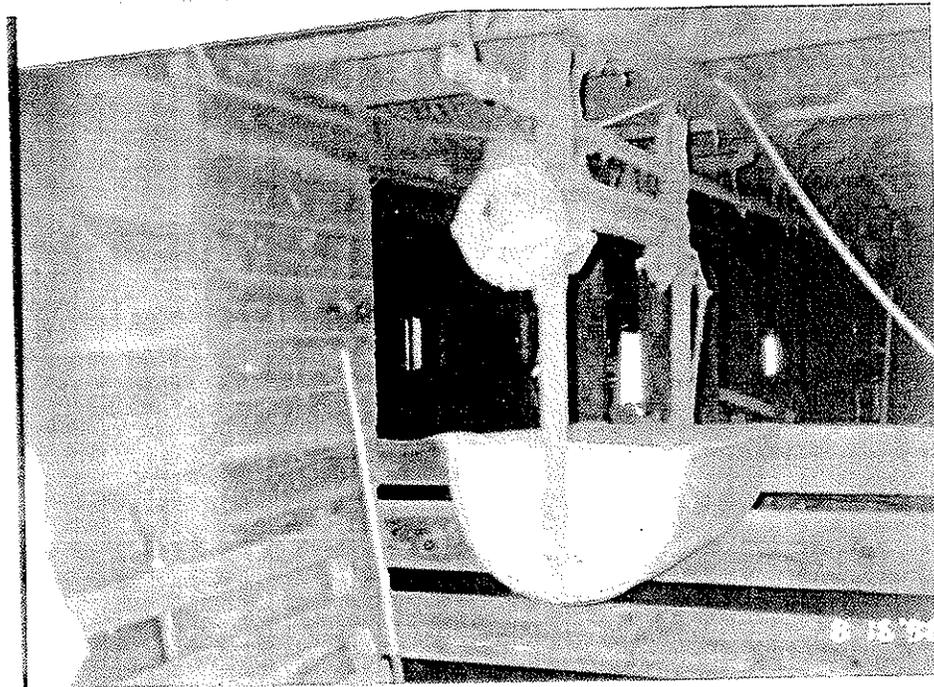


Figure 63. Top: Hoard-Schulmerich Stall. This type of stall was originated by ex-governor Hoard of Wisconsin, editor of Hoard's Dairyman. The drawing shows the stall with changes suggested by Wm. Schulmerich that were used by him on his farm near Hillsboro, Oregon. (Kent, 1910)

Bottom: Similar type stall located in the Pierce Barn in Linn County.

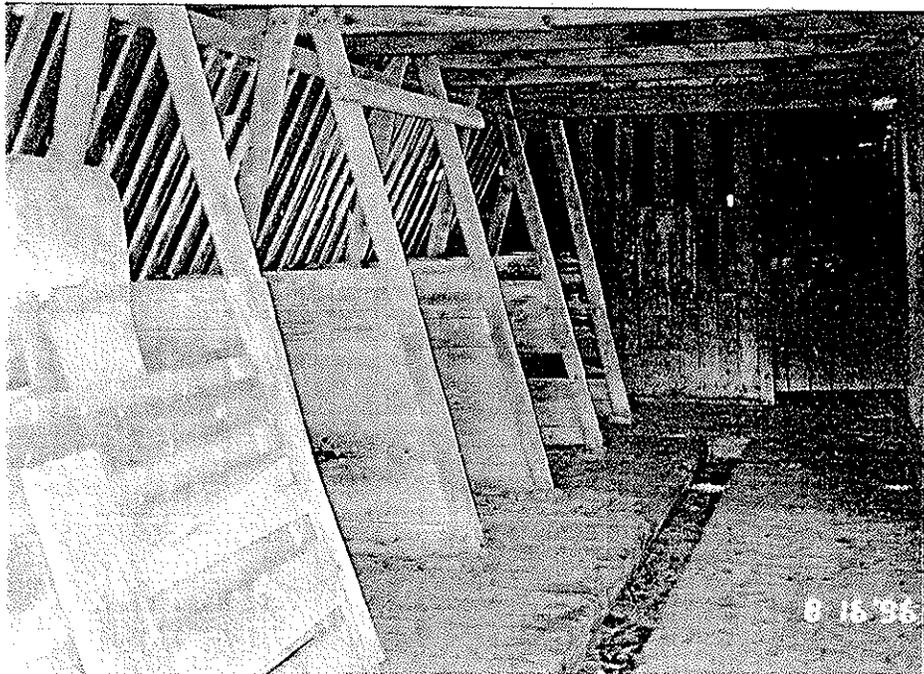
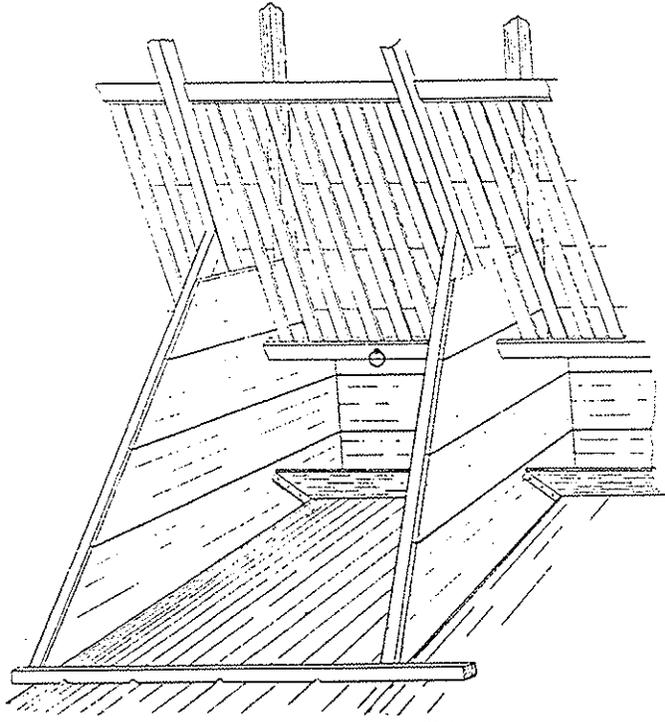
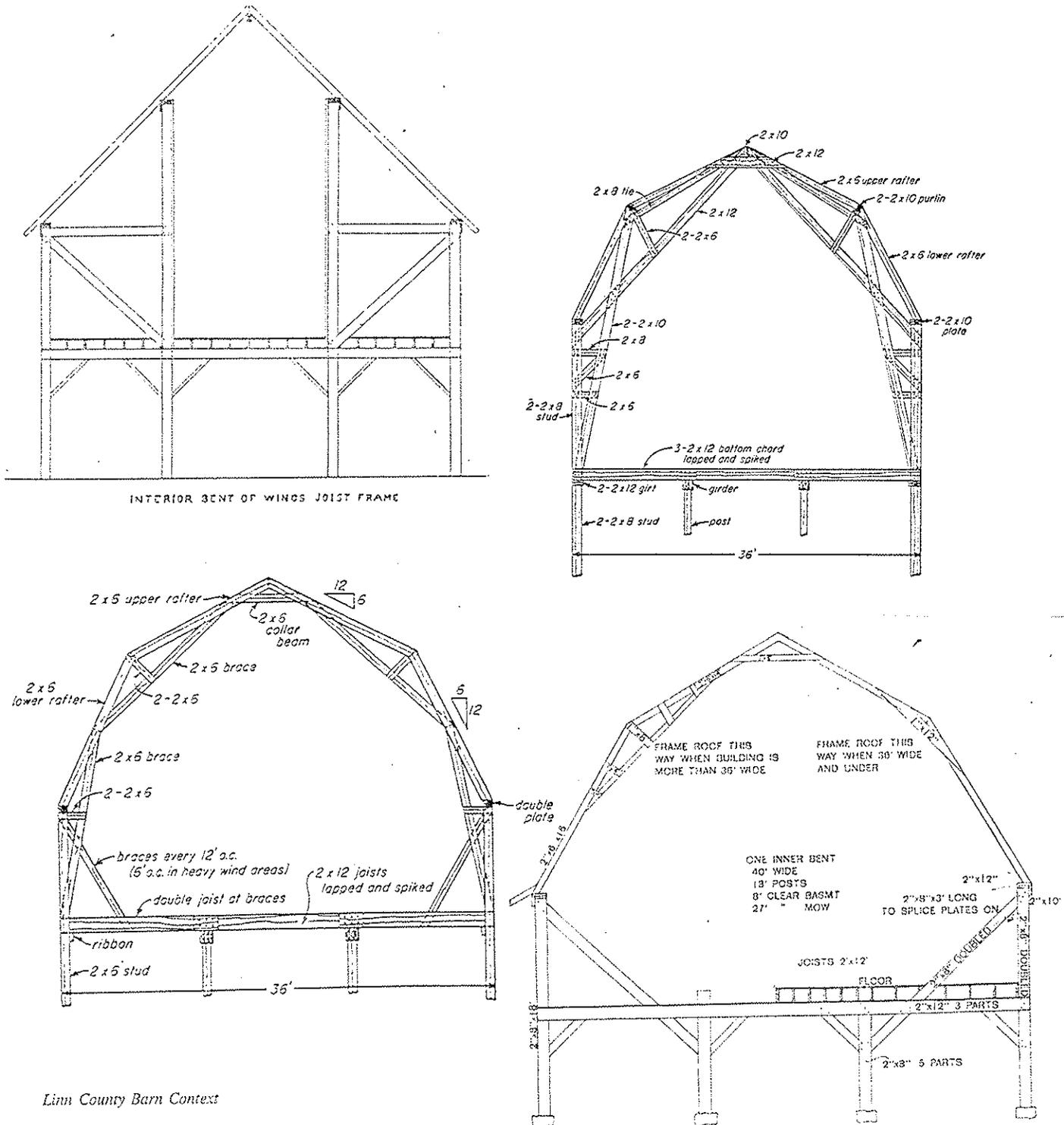
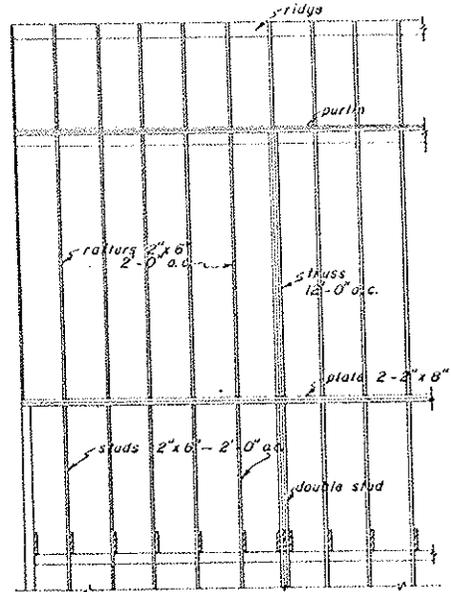
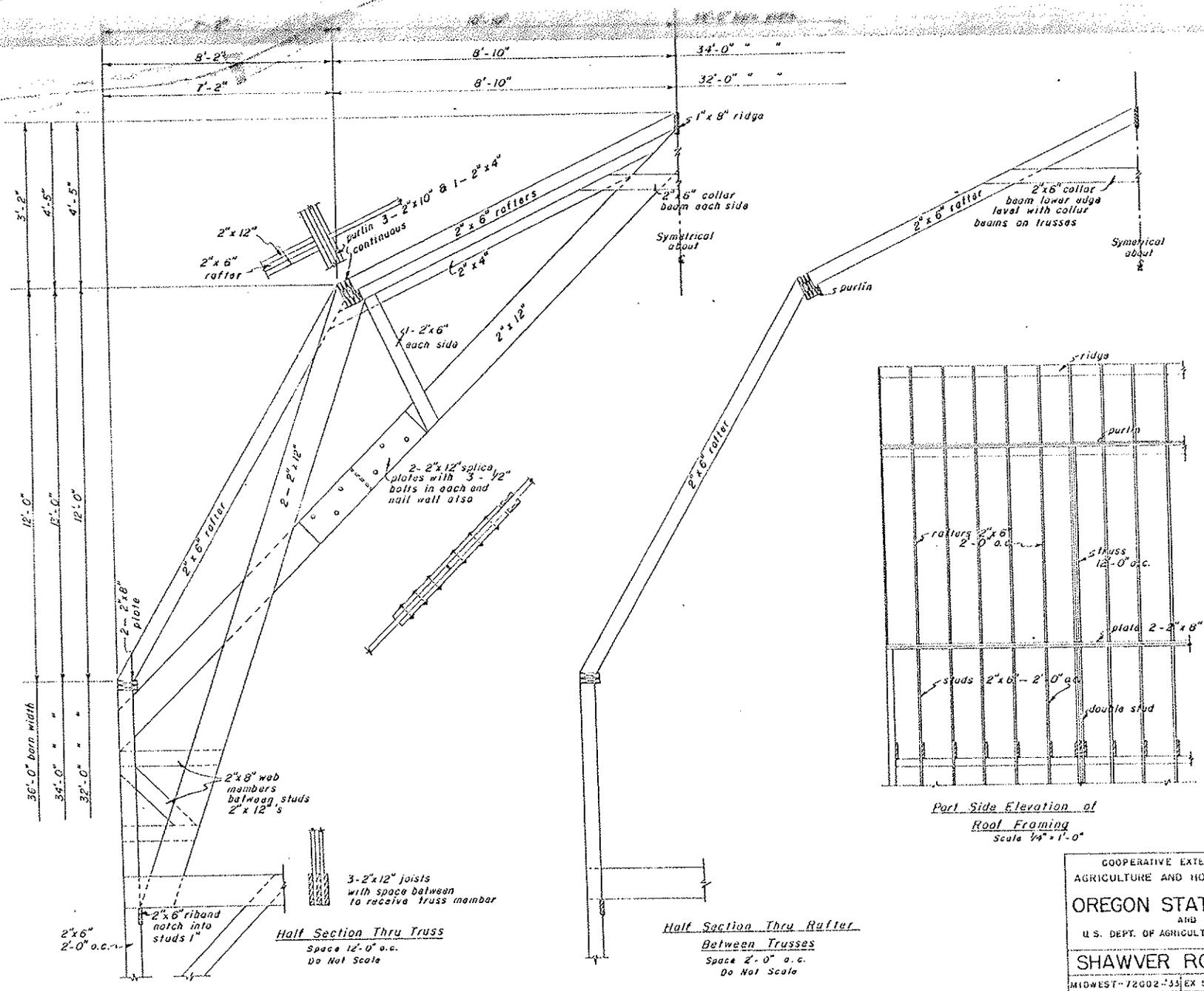


Figure 69. Barn framing. Top left: Wing's joist frame (Sanders, 1907). Top right: Shawver truss (Gray, 1955). Bottom left: "New Wing joist frame" or braced rafter truss (Gray, 1955). Bottom right: Braced rafter (Sanders, 1967).





COOPERATIVE EXTENSION WORK IN
AGRICULTURE AND HOME ECONOMICS
OREGON STATE COLLEGE
AND
U.S. DEPT. OF AGRICULTURE COOPERATING
SHAWVER ROOF TRUSS
MIDWEST-72002-33 EX 5219 SHEET 1 OF 1
PLAN NO. 2.022

Figure 70. Shawver Roof Truss. Plans from Oregon State College Extension Service, undated. (Oregon State University Archives.)

Figure 71 . Top: Schematic illustration of a barn with Shawver truss. Bottom: Shawver truss used in Beach Barn in Linn County.

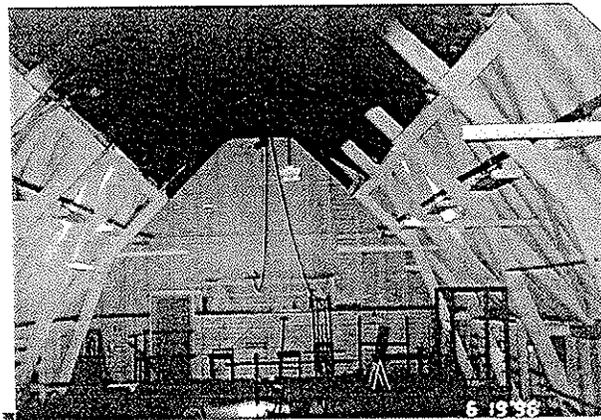
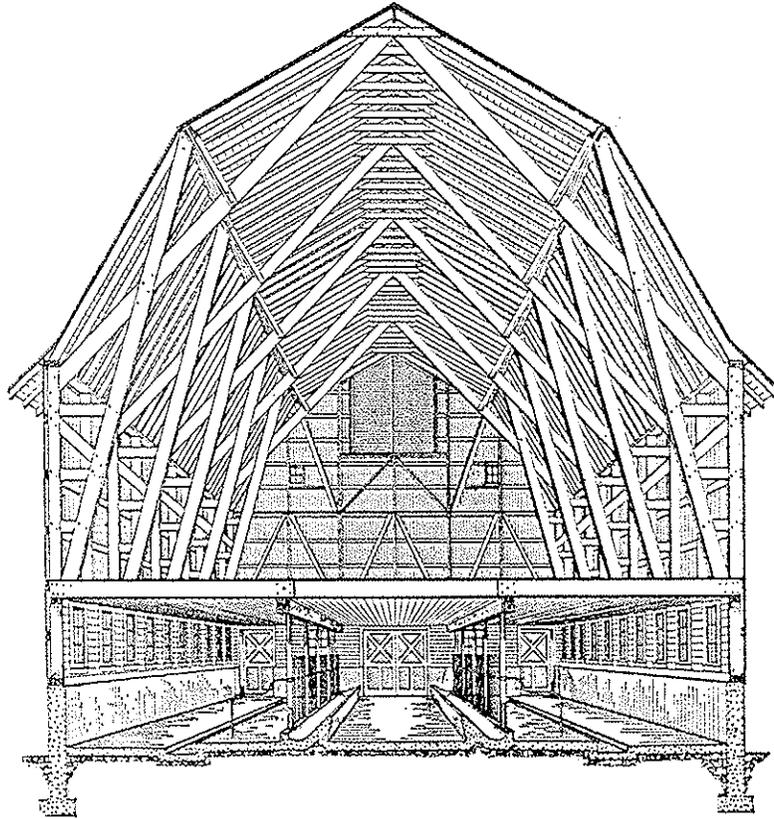


Figure 72 . Principal features of the balloon frame. (From Gray 1955.)

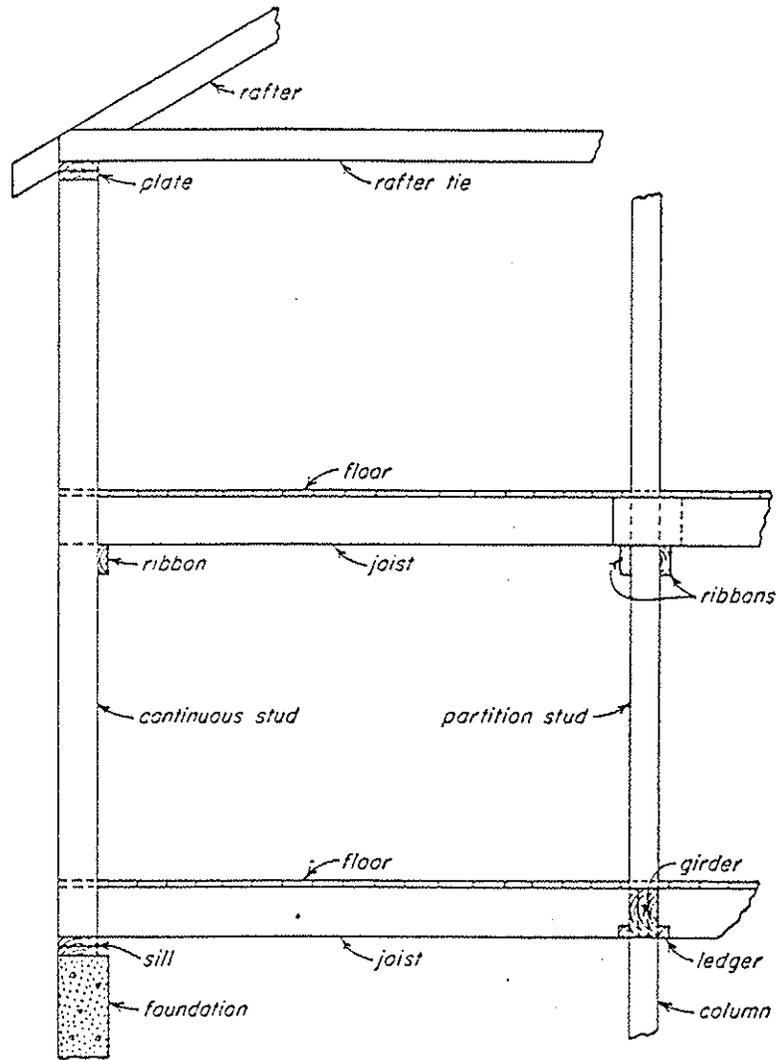


Figure 7.3 . Principal features of the platform frame. (From Gray 1955.)

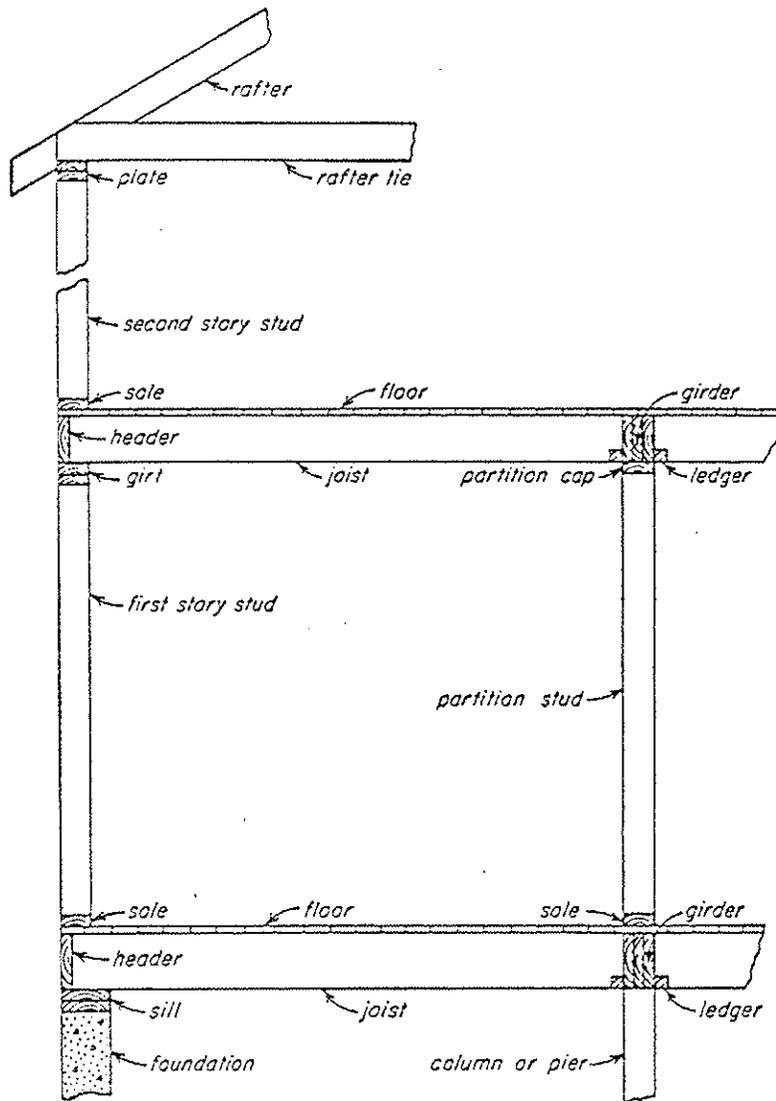


Figure 74 . Braced rafter framing for a gambrel roof from Louden 1914.

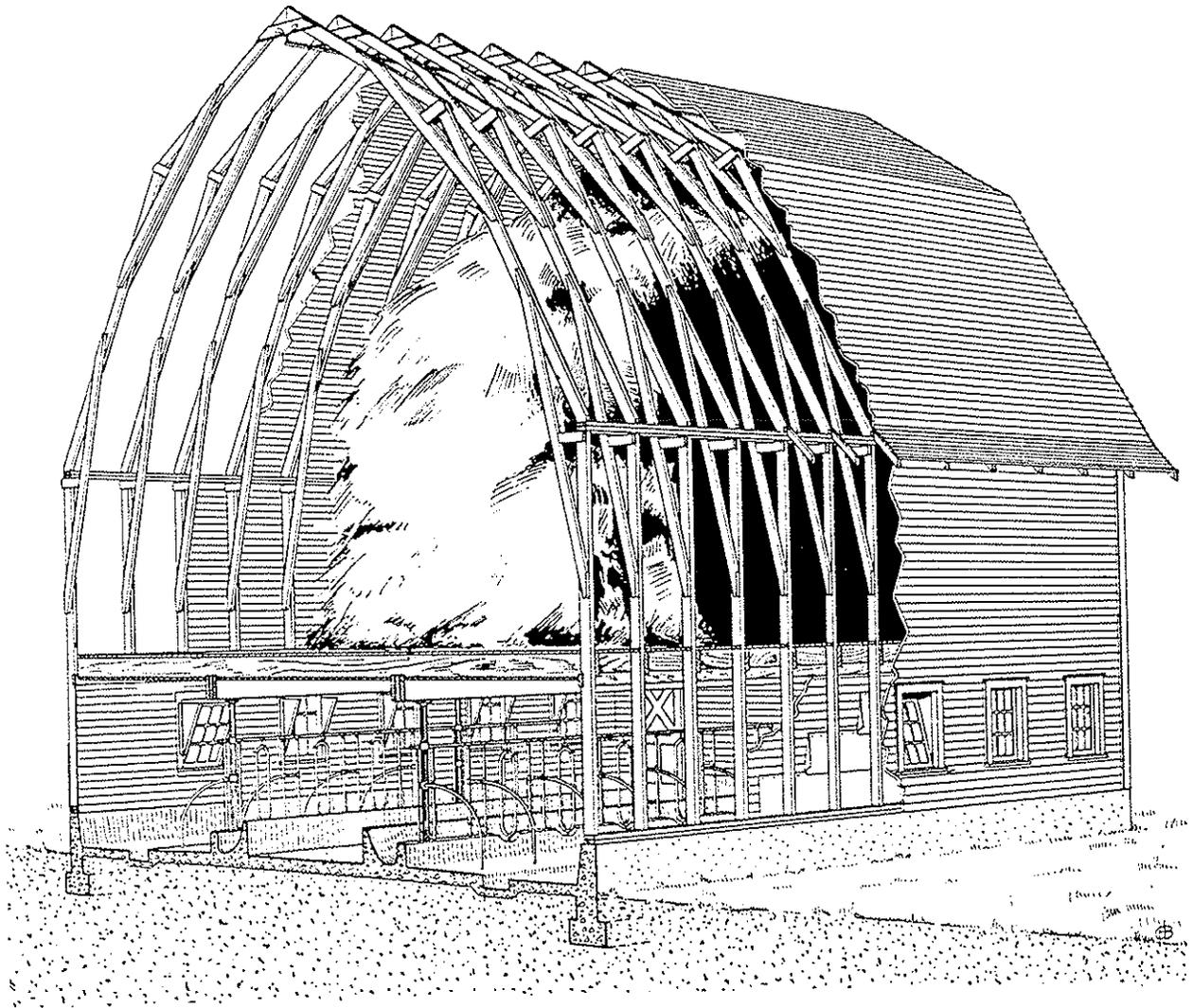
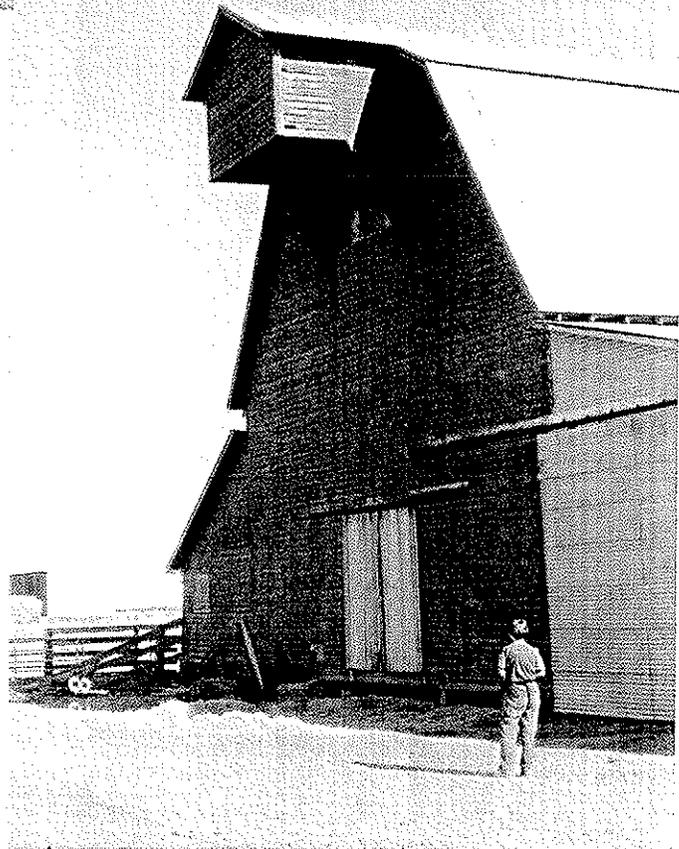
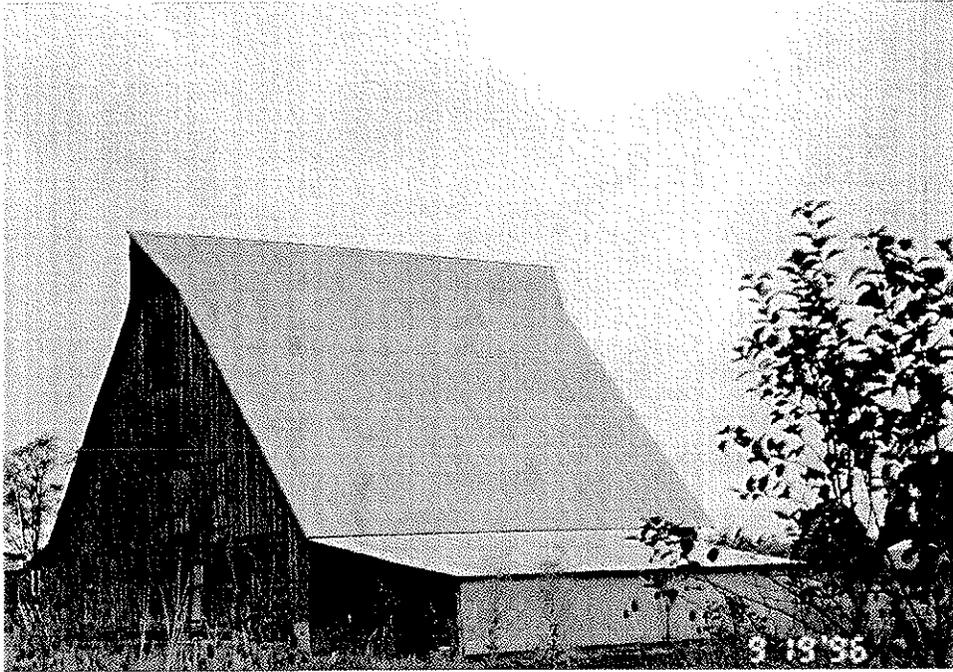


Figure 77. Hay Hoods. Hay hood with side walls (top). Boxed hay hood with solid brackets (bottom).



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 79. Hay Hoods. (Top) In the 1996 survey, only three barns in the county were located with double hay hoods. (Bottom) This is the only hay hood in the county framed with hewn timbers and mortise and tenon joinery. The hewn, timber-framed barn has not been dated with any certainty but is believed to date to ca. 1900.



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 78. Hay Hoods. Gable extended on a barn with a gable roof (top) and a barn with a gambrel roof (bottom).

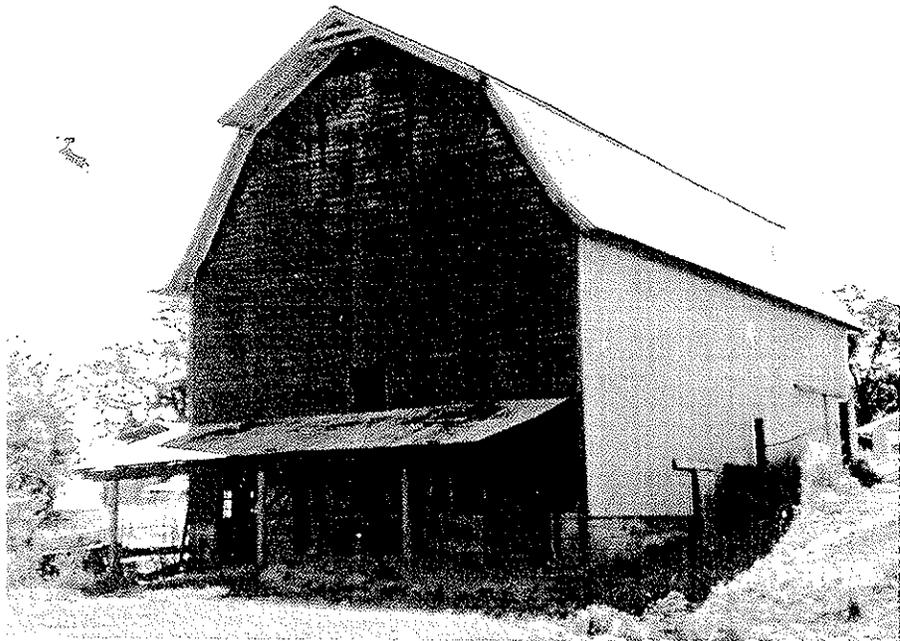
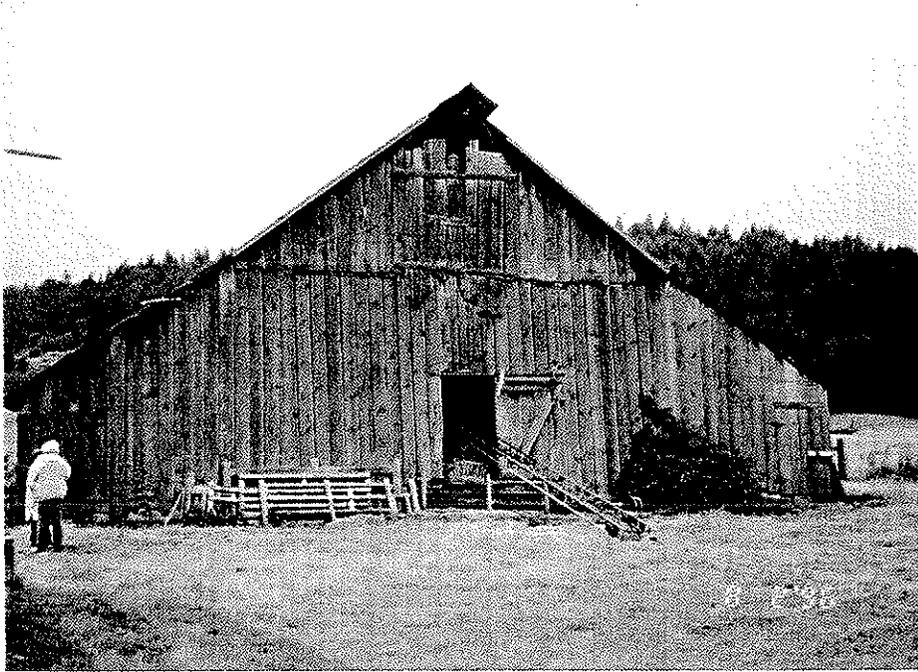
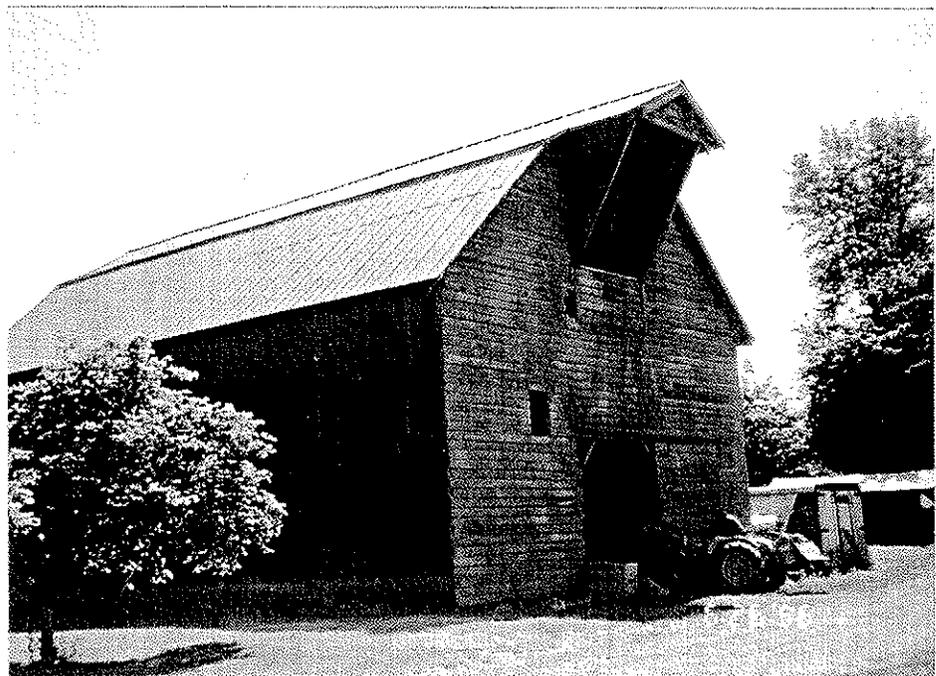


Figure 20. Hay Hoods. Gable extended with open side wall braces (top) and with solid side wall braces (bottom).



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 31 . Hay Hoods. Gable extended with solid side wall braces and concave face profile (top). Gable verges extended to form overhang which protects hay door.



Figure 82. Hay Hoods. Ridge extended, peaked hay hoods (top and bottom). This hay hood form is generally found on gambrel roofed barns.

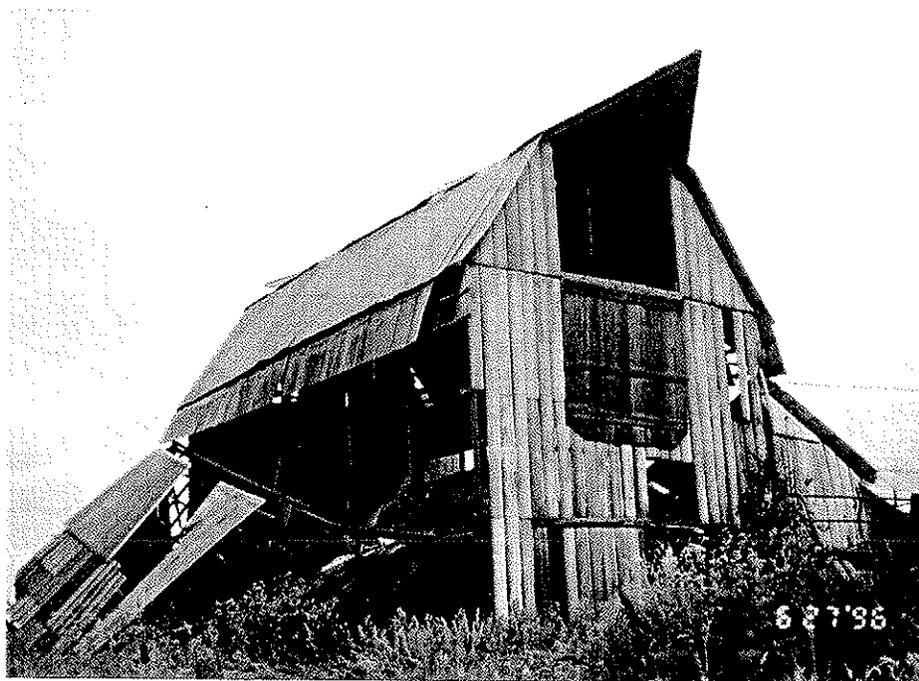


Figure 33 . Hay Sling

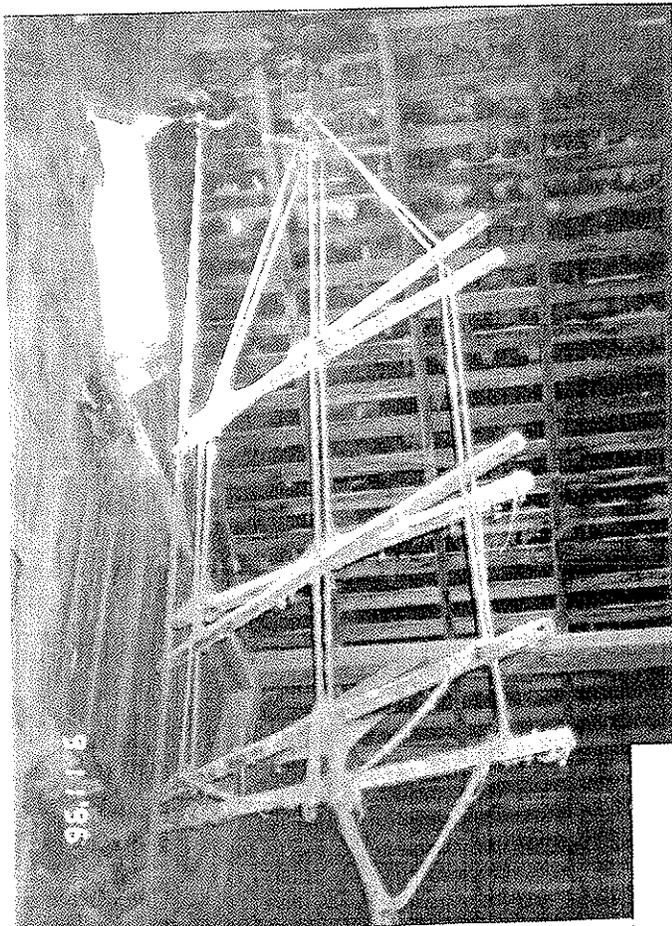


Figure 34 . Hay door
which slides up and down.

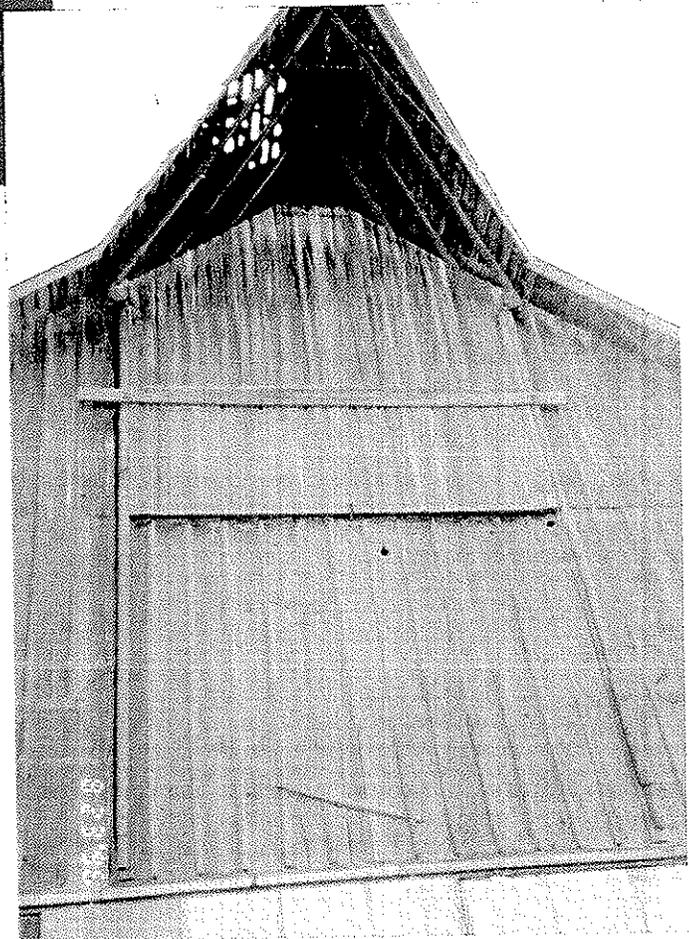
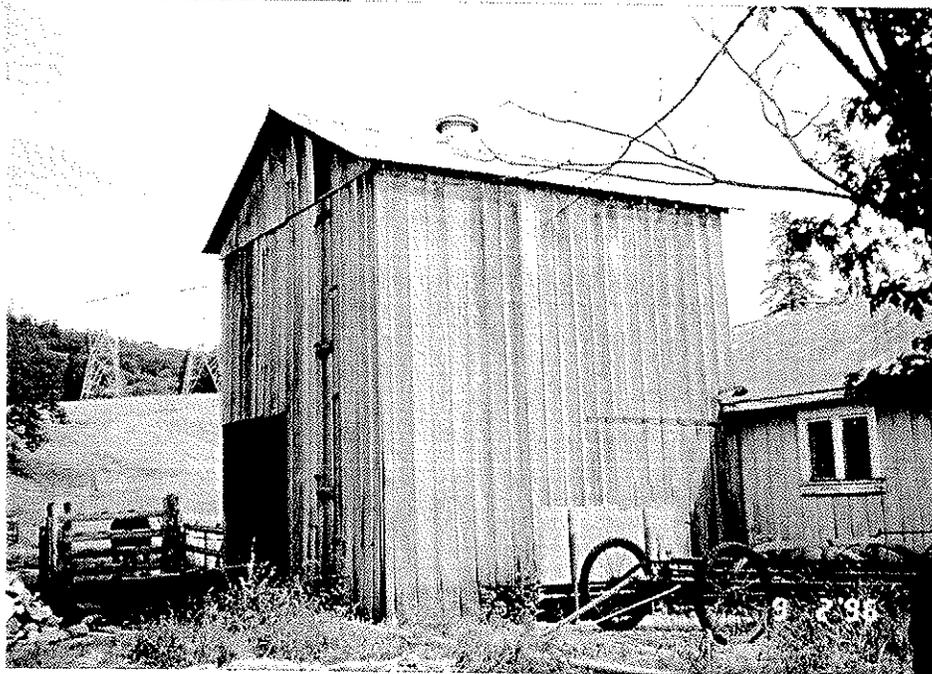
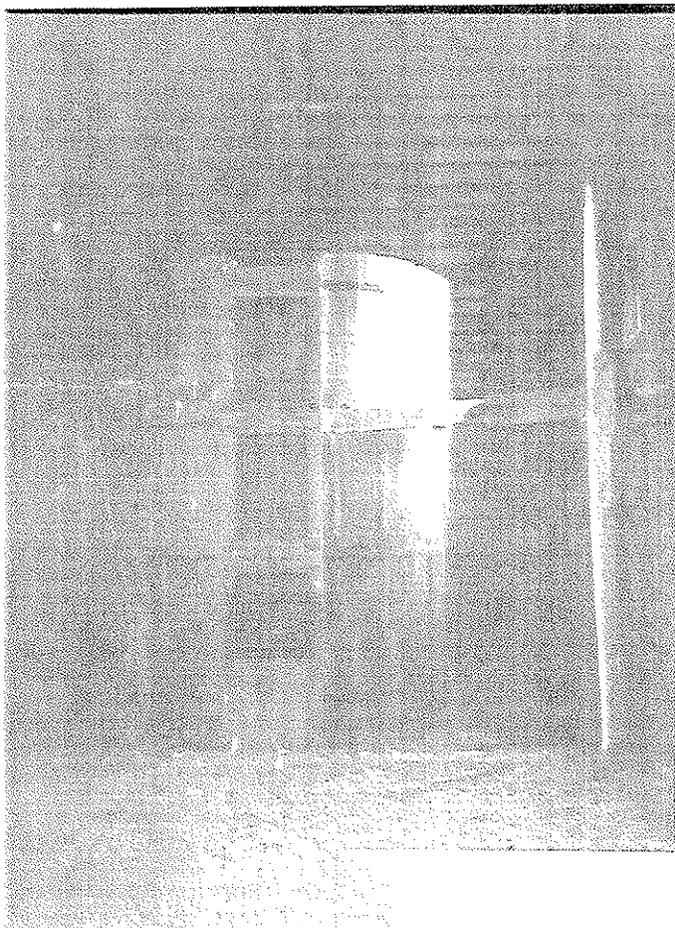


Figure 36 . Wood Stave silos. The Crabtree-Norman Farm (top) and the Cyrus-Schuler Farm (bottom). The silos date to the 1930s.



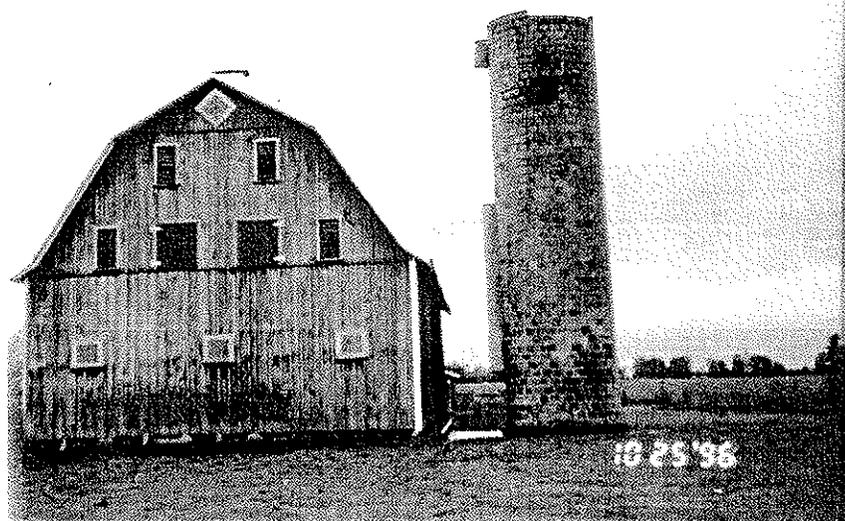
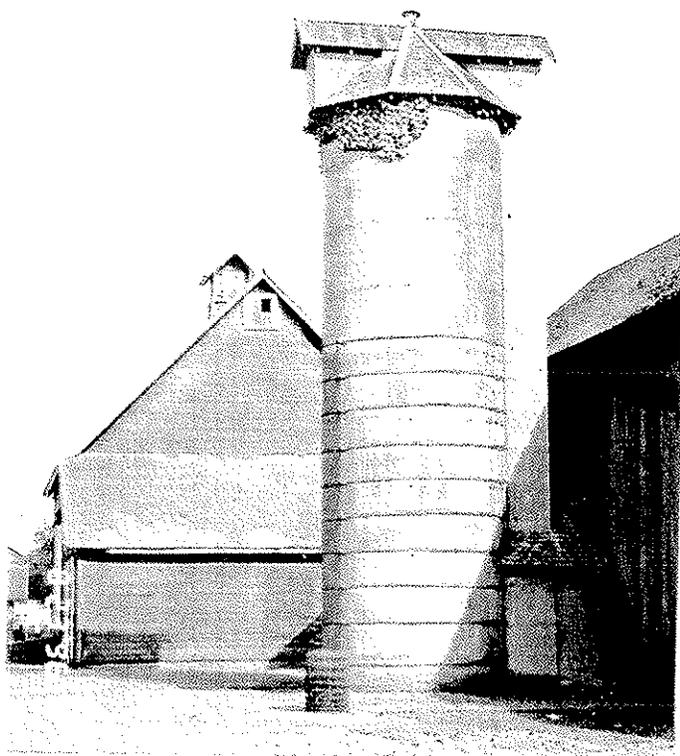
BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 87. Enclosed wood stave silos. (Top) Interior wood stave silo located in the Manis Barn. (Bottom) This frame building houses wood stave silos.



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 88. (Top) Poured concrete silo at the Nicewood Farm. (Bottom) Hollow tile silo. on the Kennel Farm.



BARN DESIGN AND CONSTRUCTION, 1900-1919

Figure 89. Concrete stave silos. (Top) Balkovich Barn with conical roof and dormer. The Balkovich family is of Czech descent. (Bottom) The Baker Barn has concrete stave silos with hemispherical roofs.

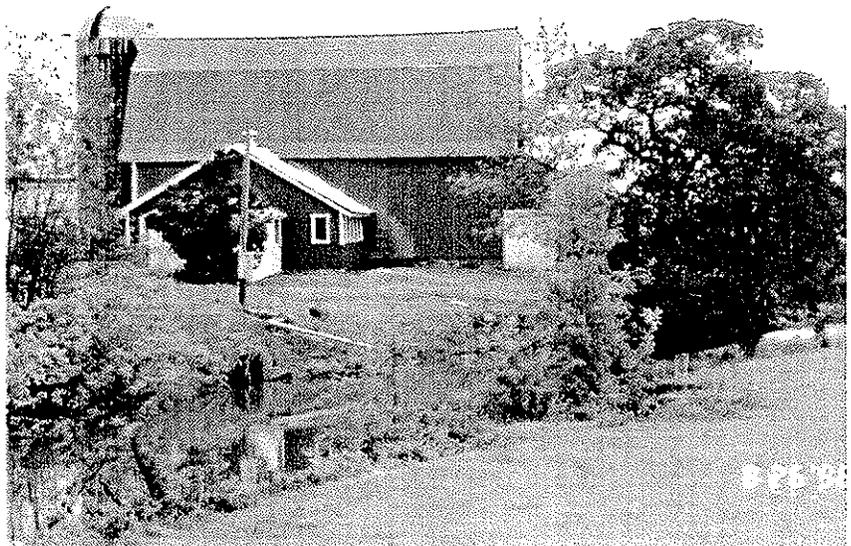
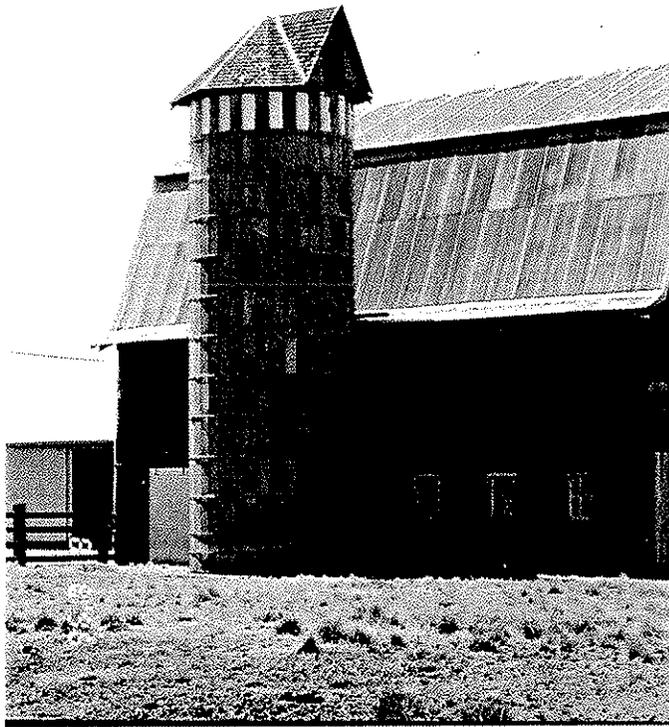


Figure 90 . Octagonal Barn. The G.W. Pugh Barn, built ca. 1910, is the only example of a round or octagonal barn in Linn County that was built prior to 1945. (Plan not drawn to scale.)

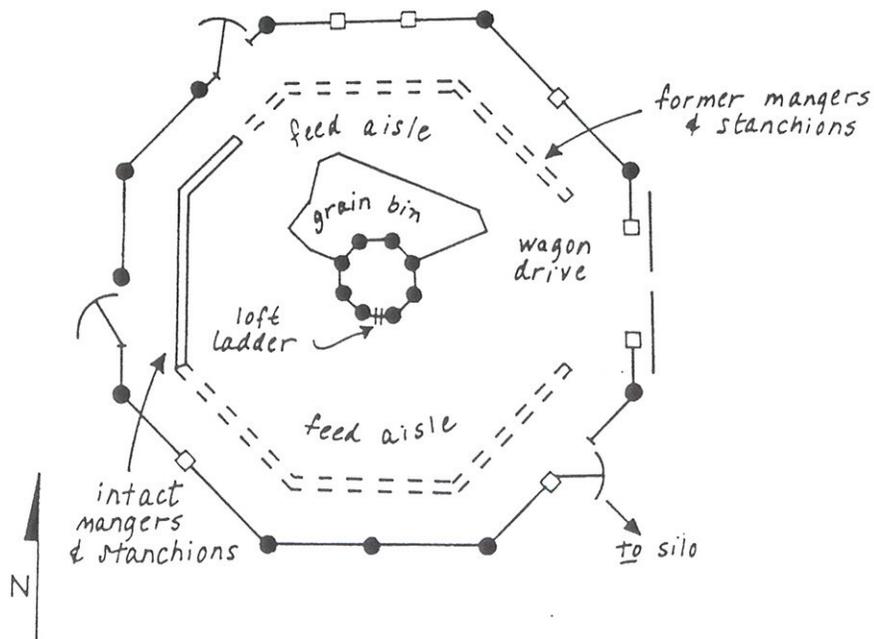
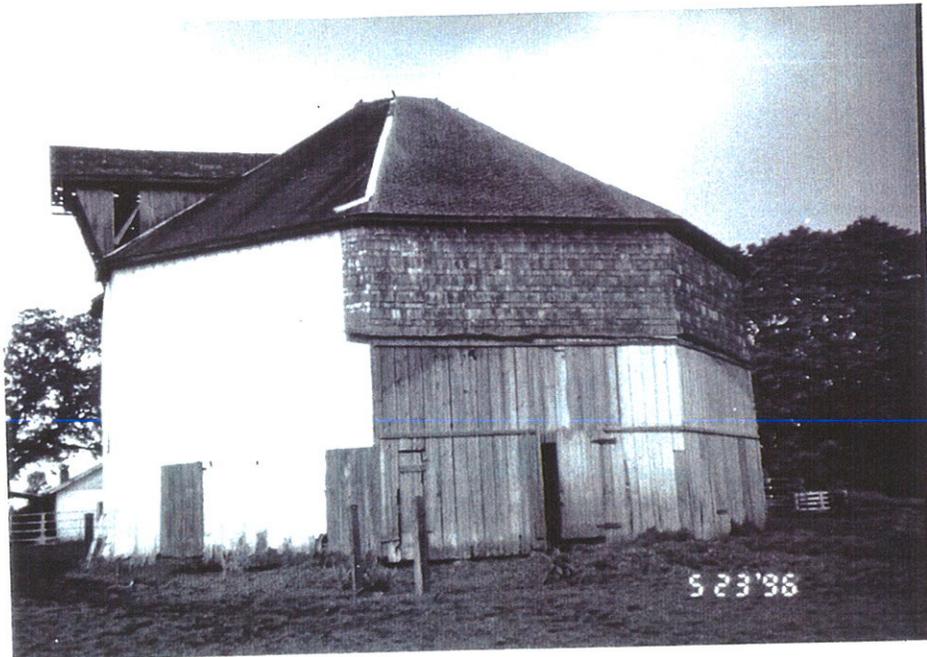
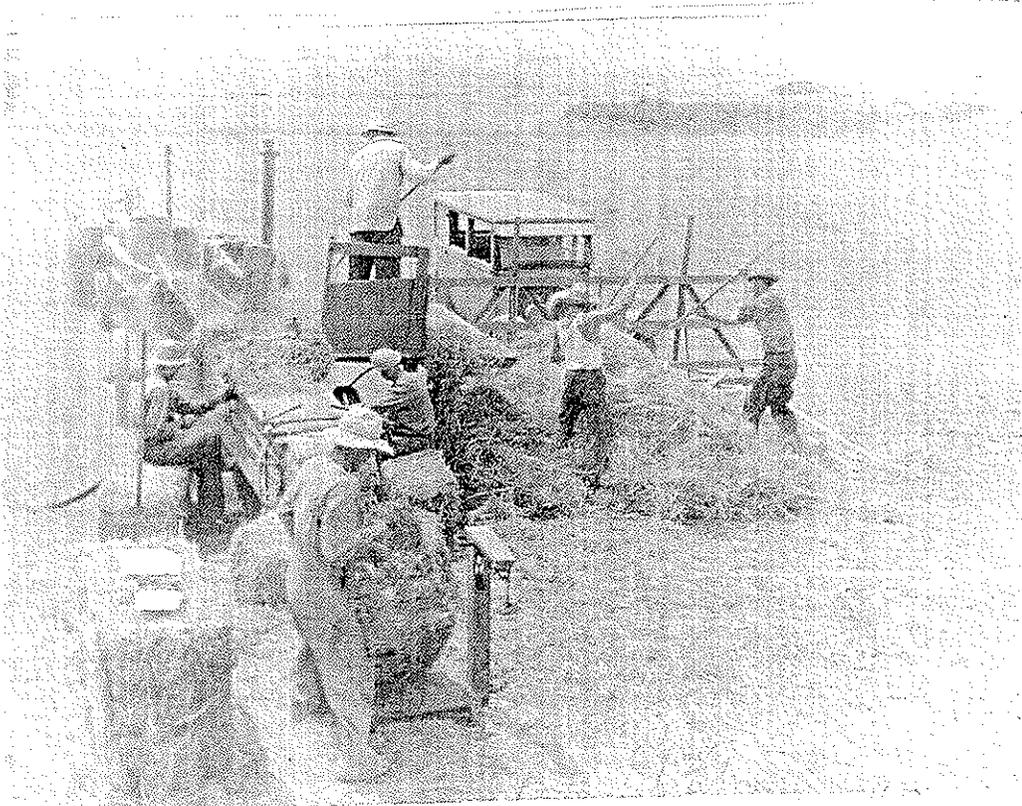
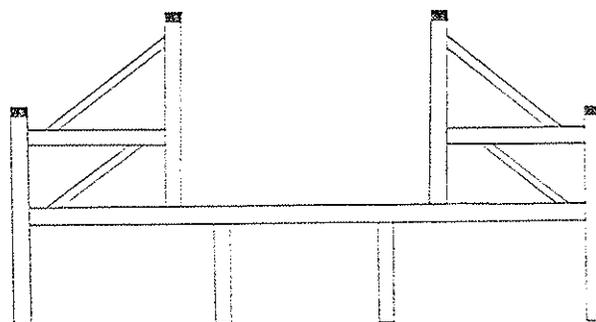
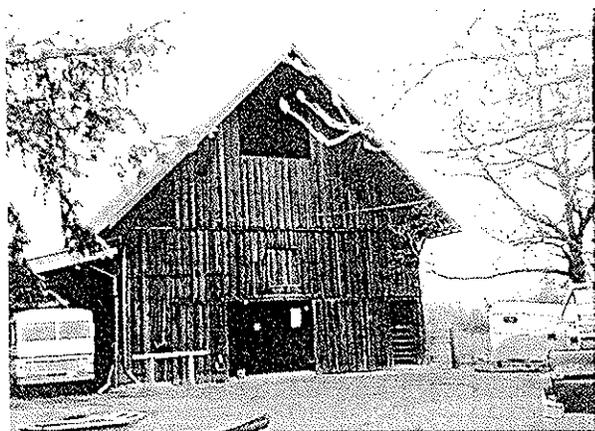
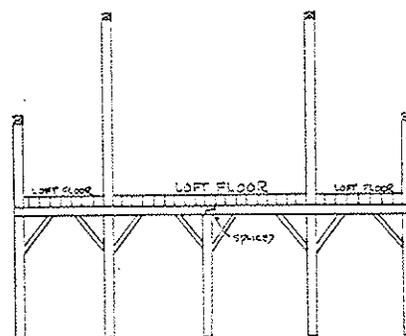
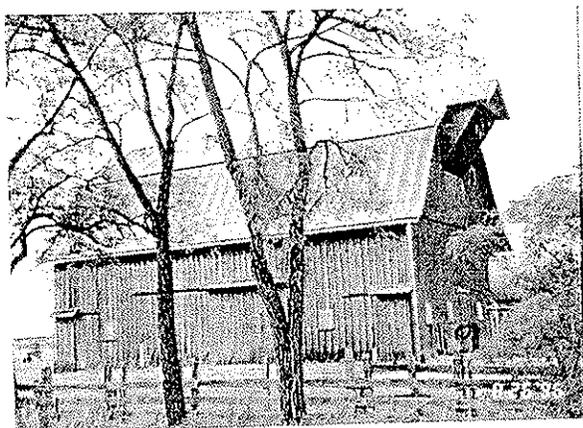
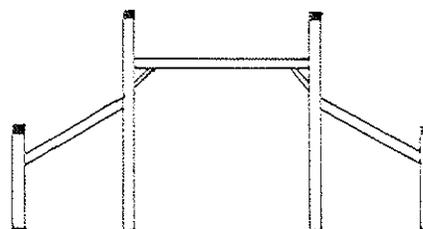


Figure 93 . (Top) Transporting hay to the baling machine and (Below) Baling hay with a baling machine. Roscoe Paine farm ca. 1940.



BARN CONSTRUCTION AND DESIGN, 1920-1945

Figure 94 . Timber frame bents. **Top:** The Wassom Barn, a feeder barn built in ca. 1920 with mortise and tenon joinery. The wood pegs are made of osage orange. This bent configuration was not observed in any other Linn County barn during the 1996 survey. **Center:** The Bierly Barn, a gambrel-roofed barn built in 1936 with nailed joinery. **Bottom:** The Kraschnewski Barn, 1922. The most recent hewn timber frame barn recorded in Linn County during the 1996 survey. Bent configuration is suggestive of a modification of Wing's joist frame although all members are timbers.



Linn County Barn Context

BARN CONSTRUCTION AND DESIGN, 1920-1945

Figure 95 . The Stockdale Barn, built in ca. 1932, is the only known example of a round log barn in the County.

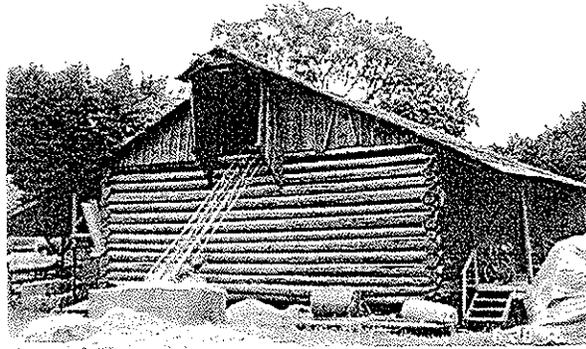


Figure 96 . Large gambrel-roofed pole barn.

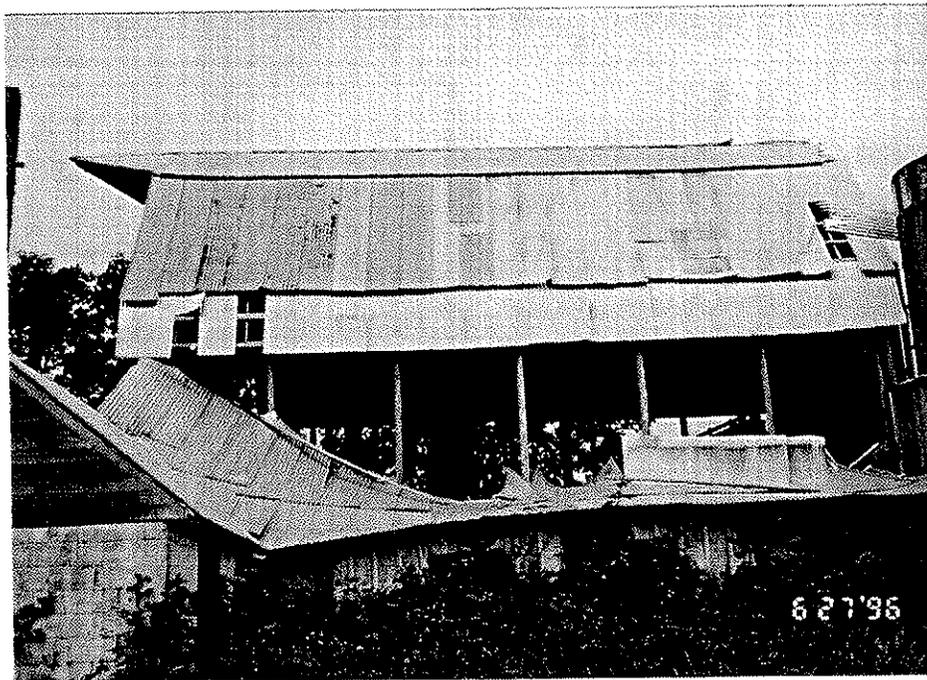


Figure 97 . Hopper windows in the Leever Barn, ca. 1920.

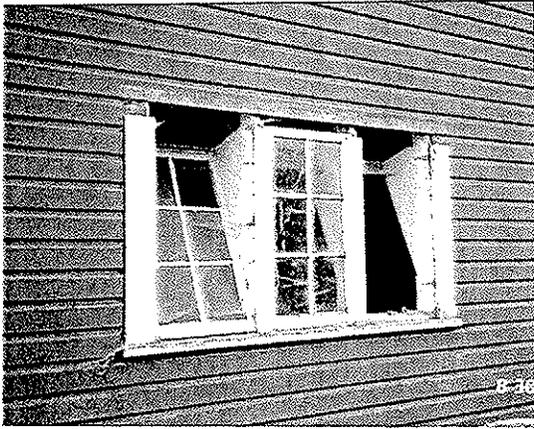


Figure 98 . Barn window details from plans of the Oregon State College Dept. of Agricultural Engineering. n.d.

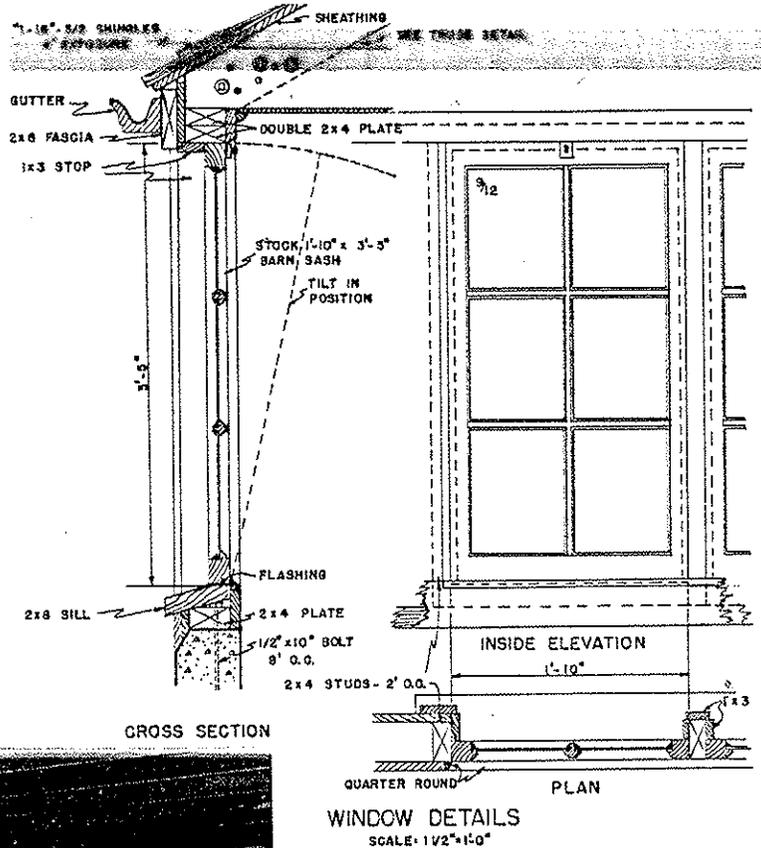


Figure 99 . Horse stalls in the 1929 Grell Barn.

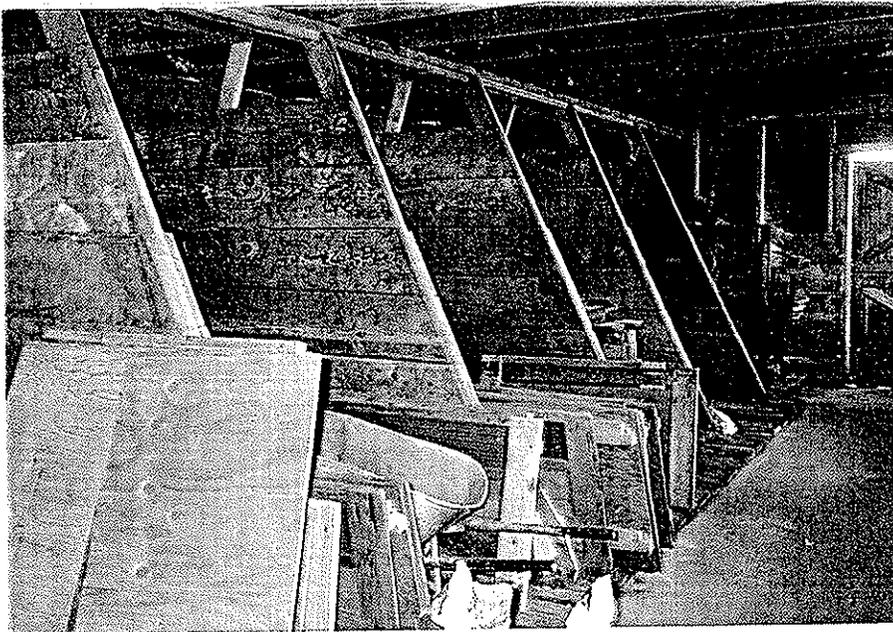


Figure 100 . Machine shed attached to barn. Hay storage above.

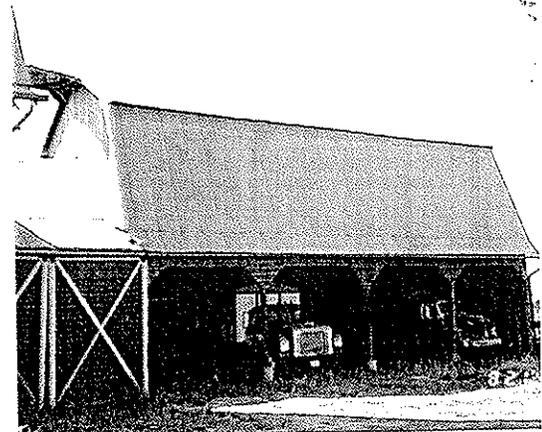


Figure 101. The Yoder Barn, built in 1922, has a longitudinal 3-aisle plan with a center feed aisle instead of a wagon drive. The loafing area is integral in the plan of the barn. (Plan not drawn to scale.)

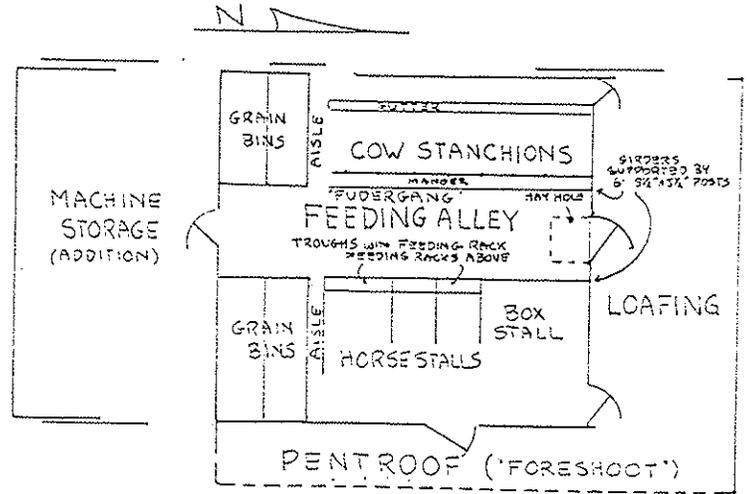
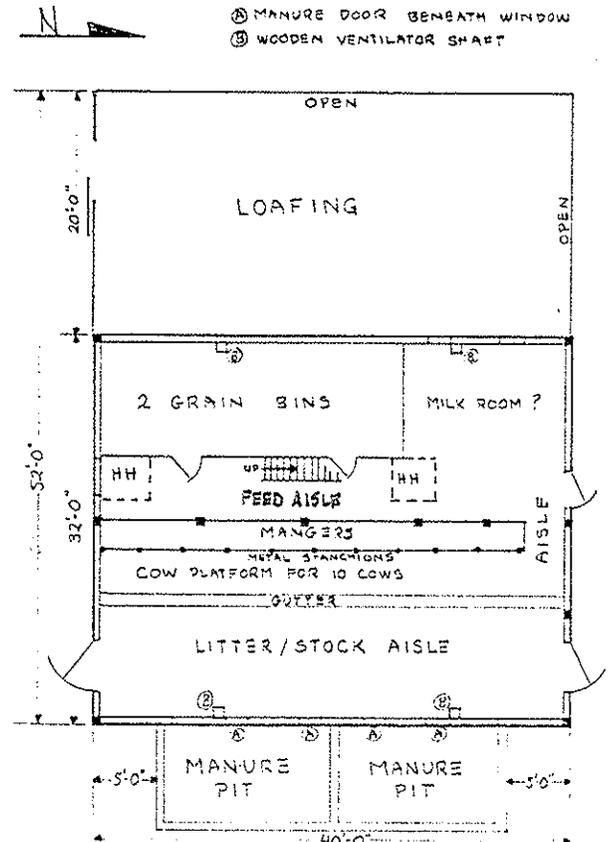


Figure 102. The G.P. Milde Barn, built in ca. 1929, also has a center feed aisle plan but is a dairy barn. (Plan not drawn to scale.)



BARN CONSTRUCTION AND DESIGN, 1920-1945

Figure 103. The John Kennel Barn, built in 1925, has a sawn timber frame and a transversely arranged plan which includes two drives. The more central drive was used to unload hay on the interior of the barn. Almost all barns built in the county during this period unloaded hay on the exterior of the barn. The loafing area is within the envelope of the barn. (Plan not drawn to scale.)

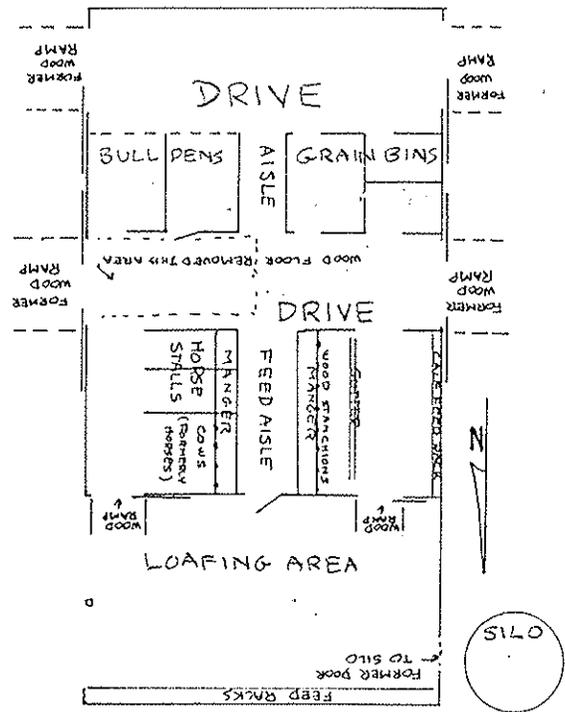
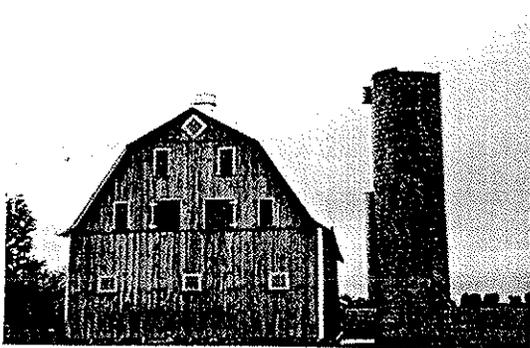
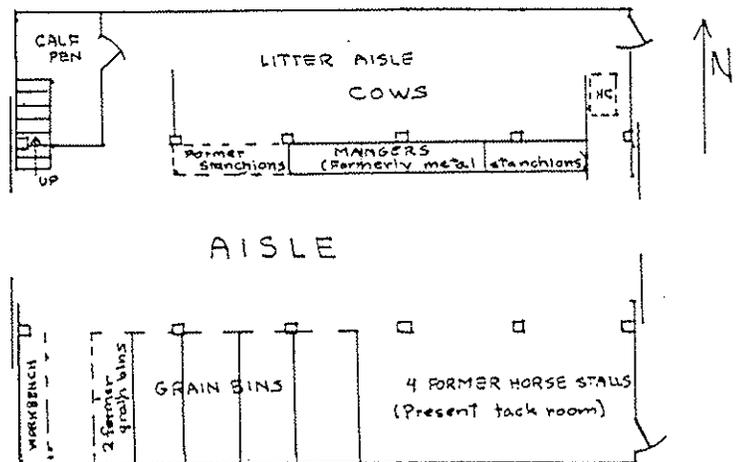


Figure 104. The Frank Pritzing Barn, built in the late 1920s, has a longitudinal 3-aisle plan. (Plan not drawn to scale.)



BARN CONSTRUCTION AND DESIGN, 1920-1945

Figure 105. The Hector Macpherson Barn, built in 1924-25, is a three aisle dairy barn. (Plan not drawn to scale.)

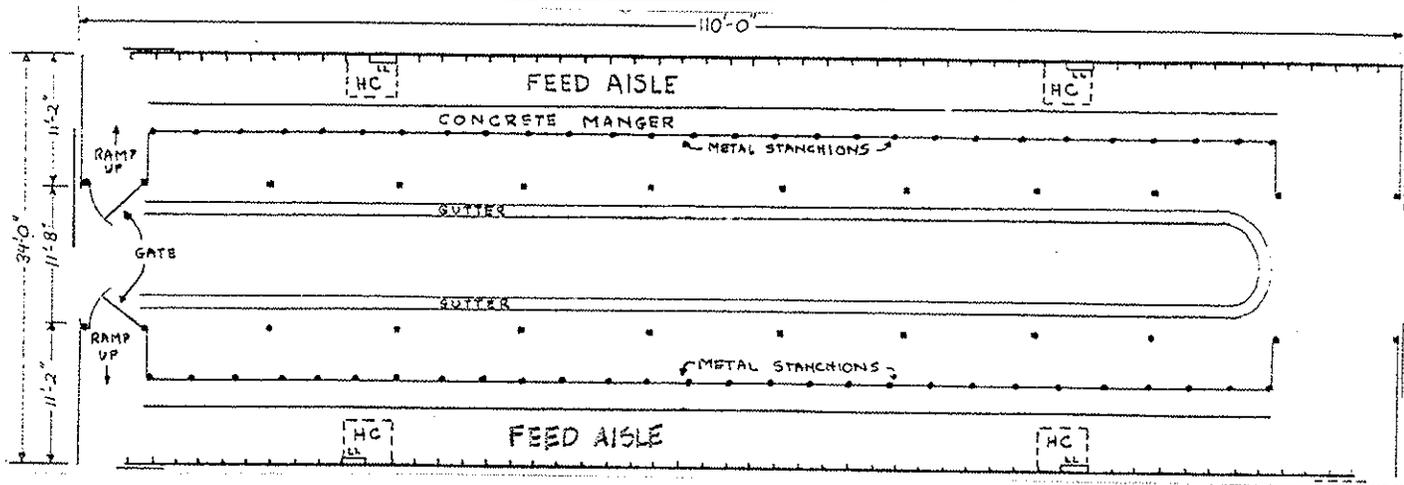
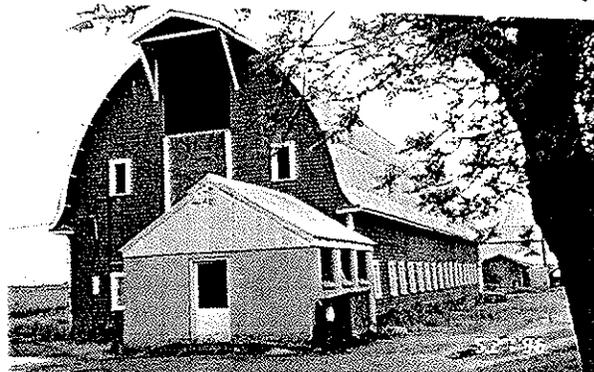
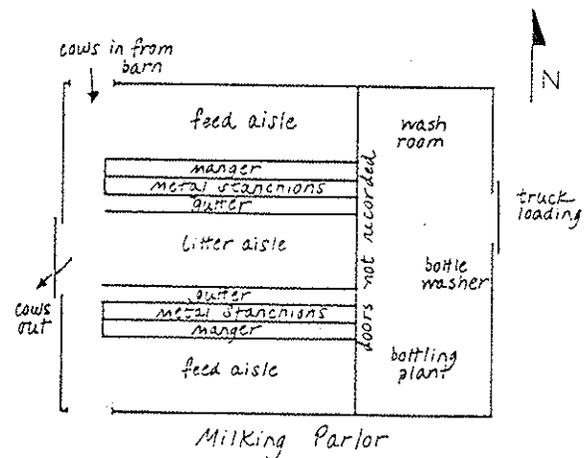
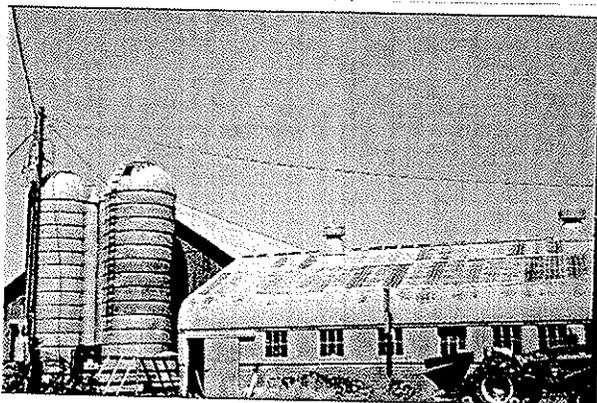


Figure 106. The milking parlor of the Prairie Rose Dairy was purchased from the James Manufacturing Co. in 1941. (Plan not drawn to scale.)



BARN DESIGN AND CONSTRUCTION, 1920-1945

Figure 107. The Bierly Barn, built in 1936, has a sawn timber frame and a transversely arranged plan of four bays. (Plan not drawn to scale.)

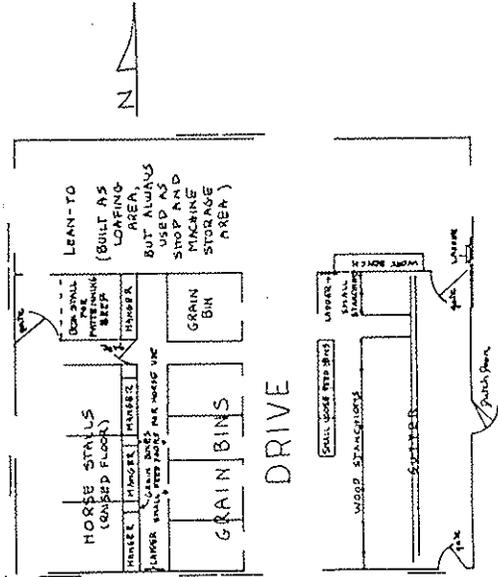
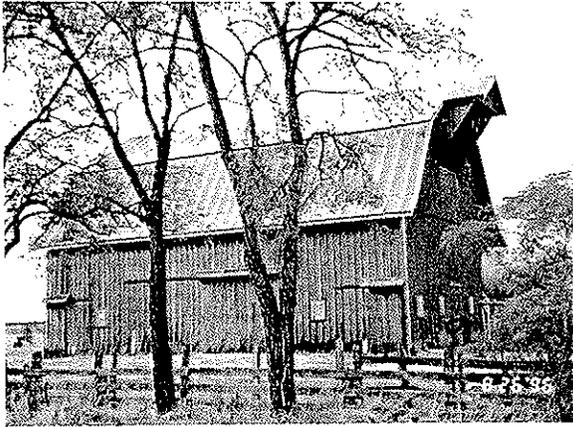


Figure 108. The Edward Grell Barn, built in ca. 1929, has a balloon frame with braced rafter roof. (Plan not drawn to scale.)

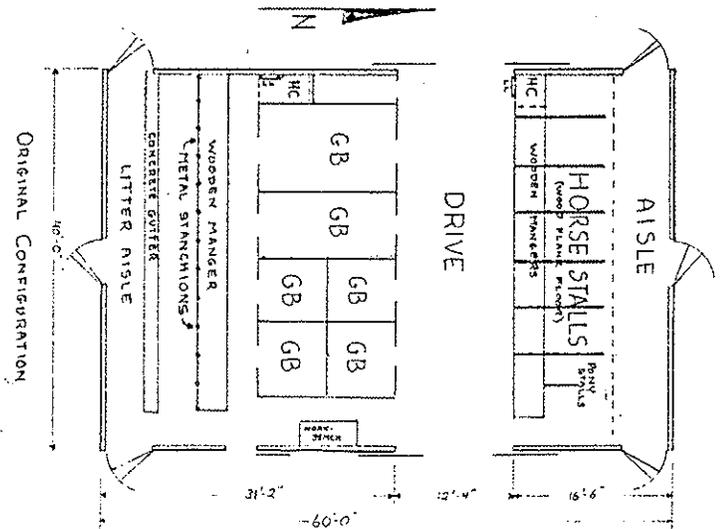
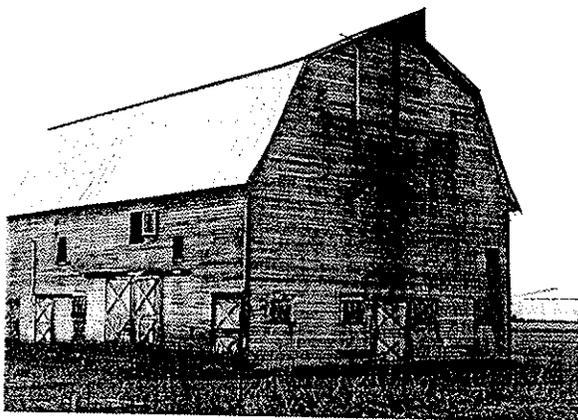


Figure 109. The Dave Schrock Barn, built in ca. 1934, illustrates another transverse arrangement. The "wagon drive" has been reduced to equipment storage, however. (Plan not drawn to scale.)

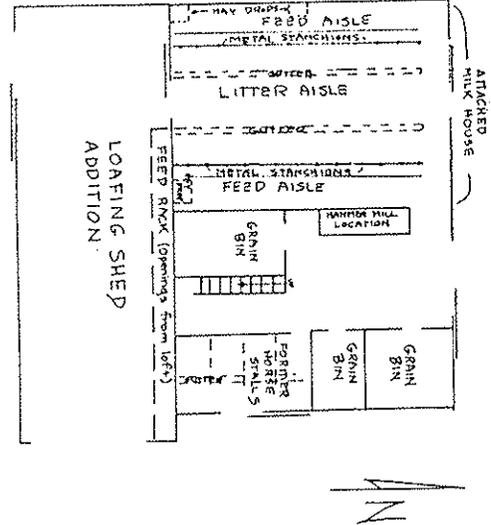
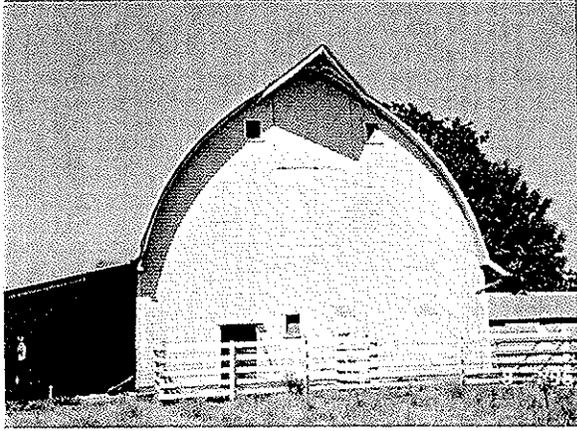
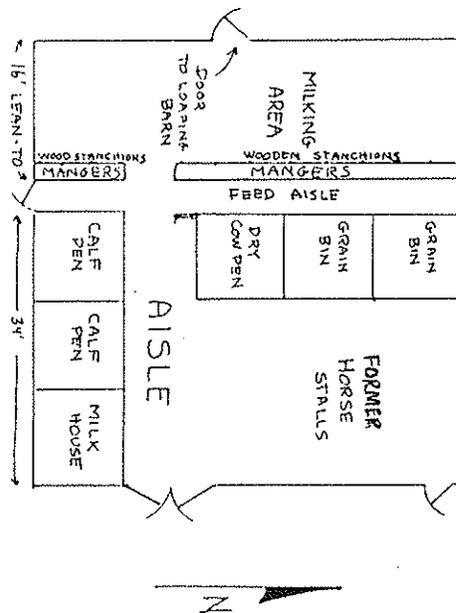
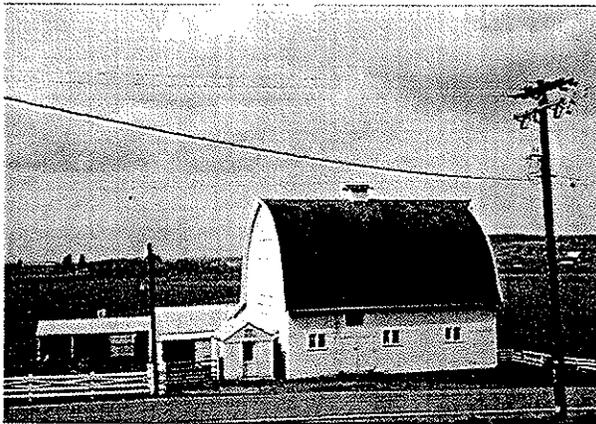


Figure 110. A barn built by the Union Century Life Insurance Co. in ca. 1930. The Schmidt Barn illustrates another arrangement which originally included a milkhouse within the barn and cow milking in a lean-to. The milkhouse adjacent to the barn was built later. (Plan not drawn to scale.)



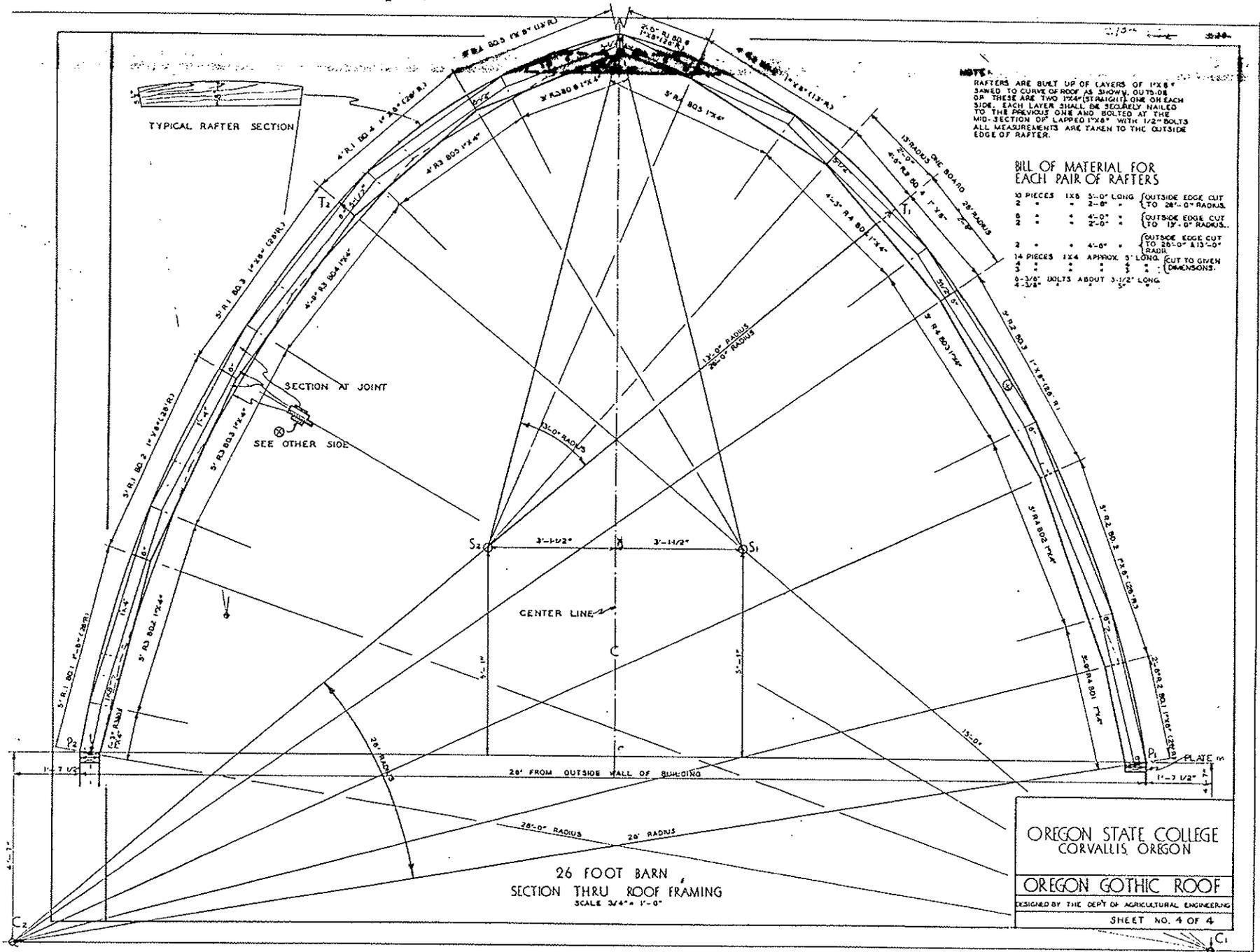


Figure 112. "Oregon Gothic Roof". Plans from Oregon State College Extension Service, undated. (Oregon State University Archives.)

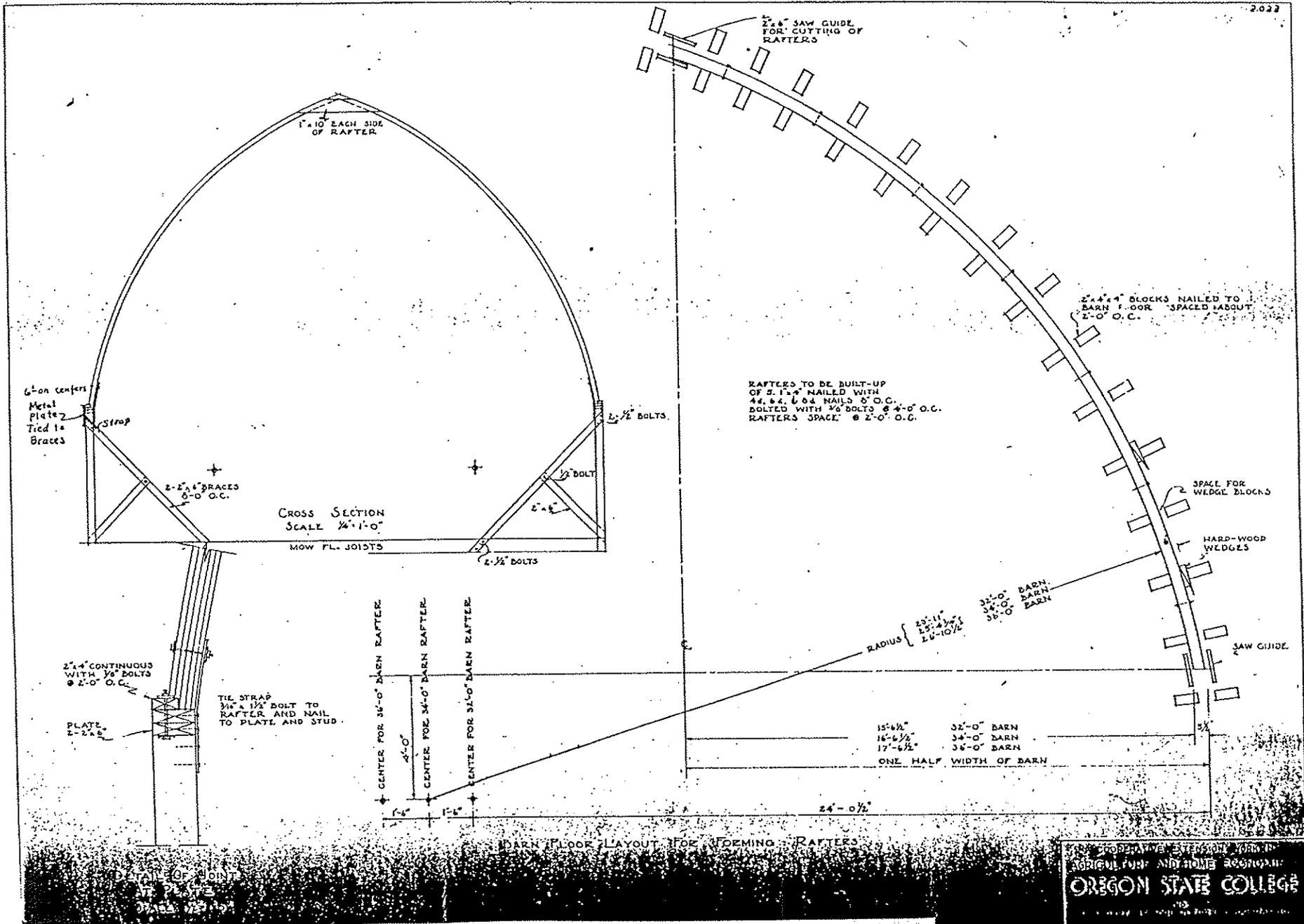


Figure 113. Gothic Rafters Bent Type. Plans from Oregon State College Extension Service. Plan illustrates how to bend rafters on the floor of the barn. (From the Oregon State University Archives.)

AGRICULTURAL EXTENSION WORK IN
AGRICULTURE AND HOME ECONOMY

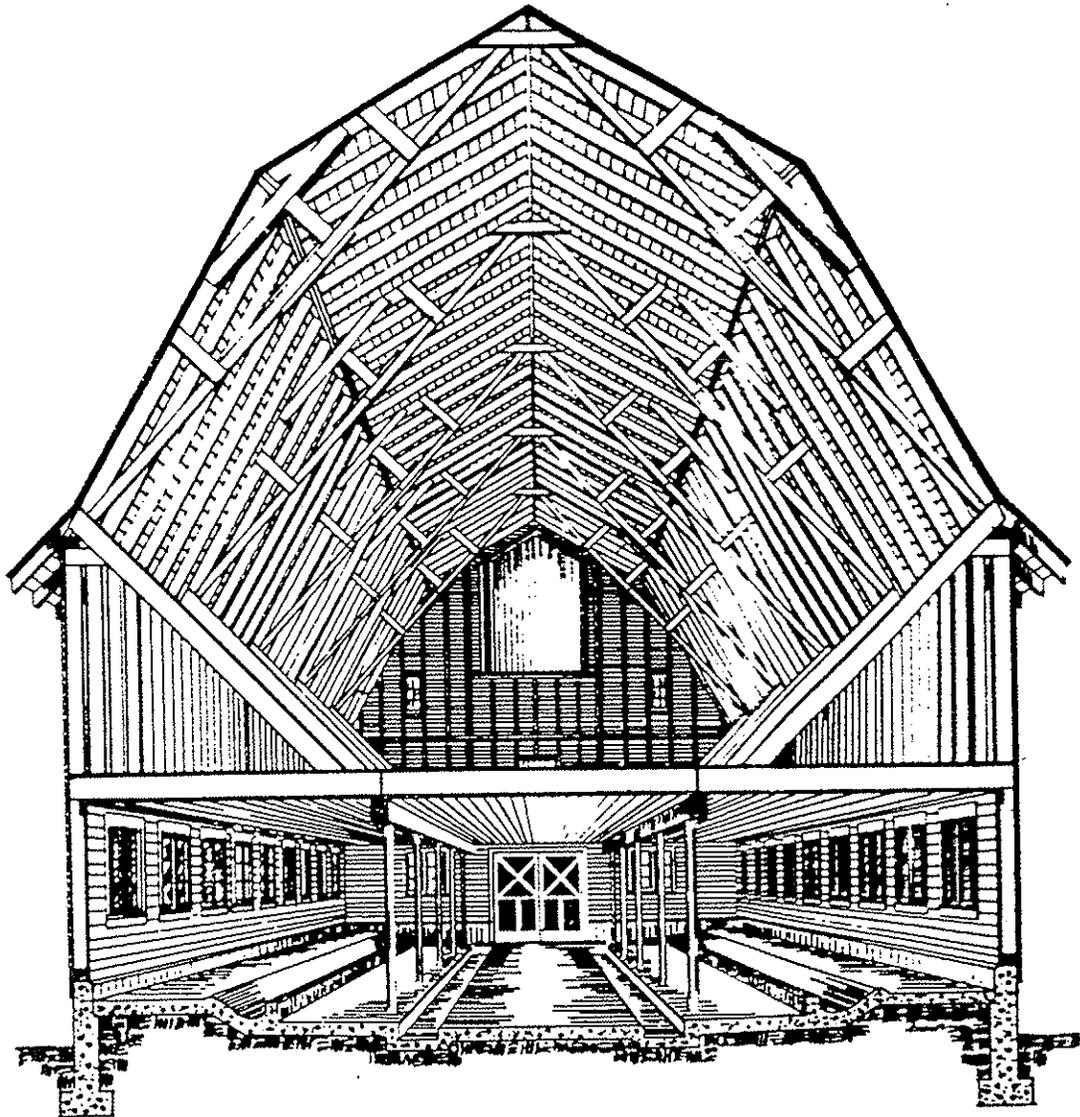
OREGON STATE COLLEGE

1925

GOTHIC RAFTERS BENT TYPE

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Figure 115. Cut-away view of the Iowa Truss



BARN CONSTRUCTION AND DESIGN, 1920-1945

Figure 117 . Top: The Shelby Barn built in ca. 1939. **Bottom:** Milking parlor added to the 1914 Baker Barn in 1938 at a cost of \$800.00. The milkhouse (white in photograph) was added in 1942 or 1943 for an additional \$1,000.00.



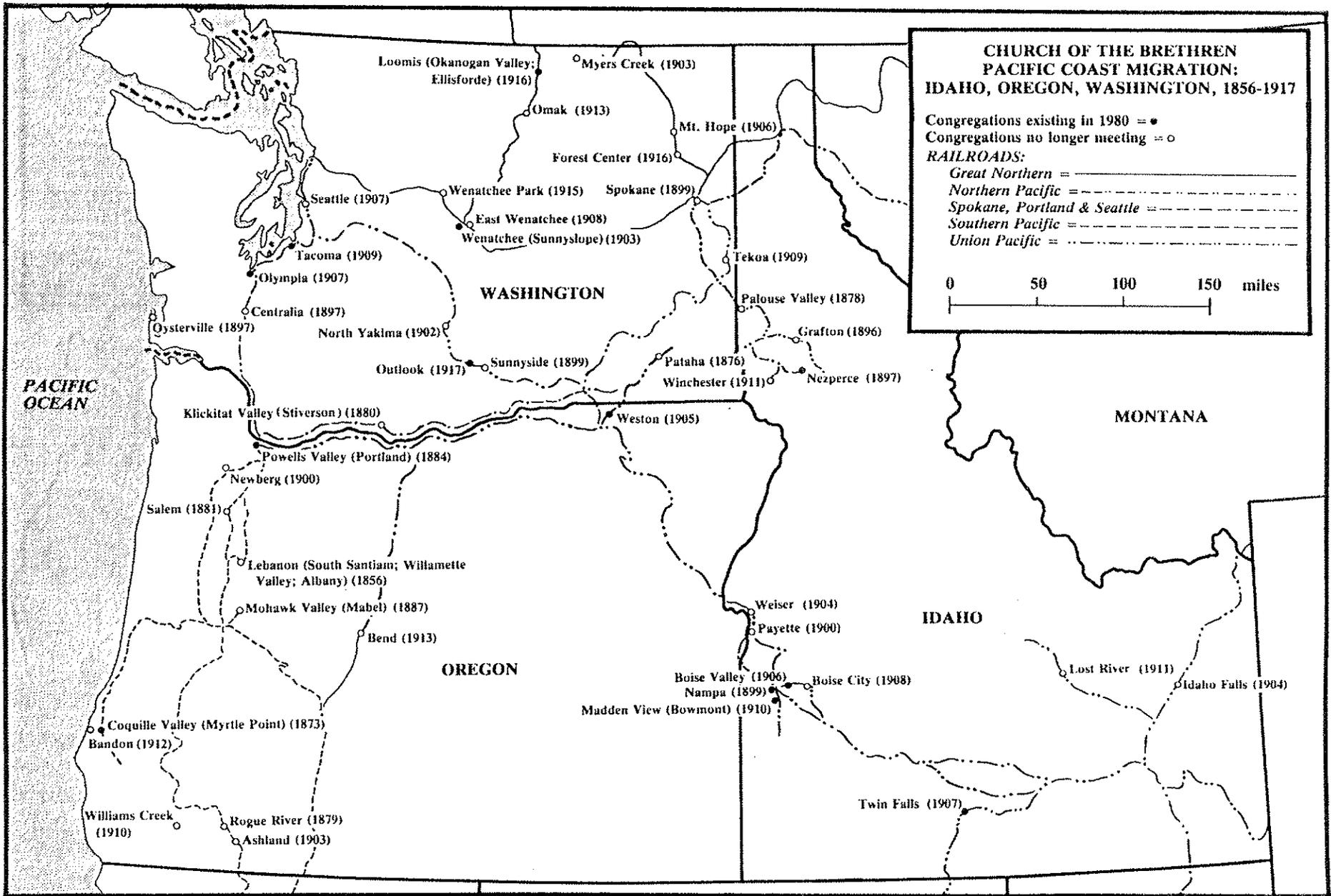
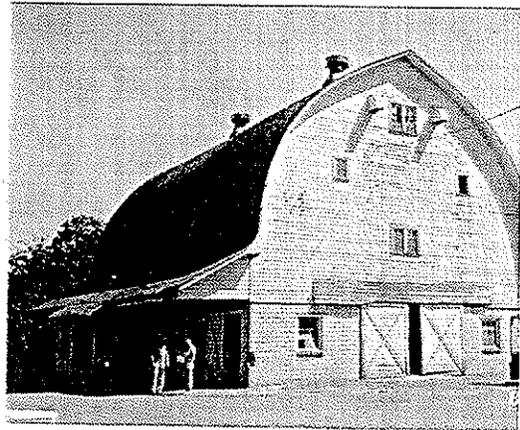
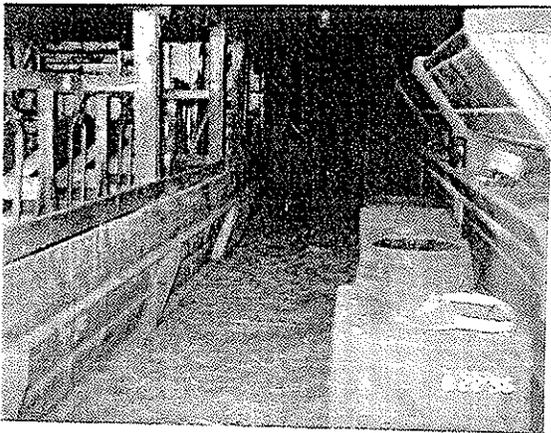
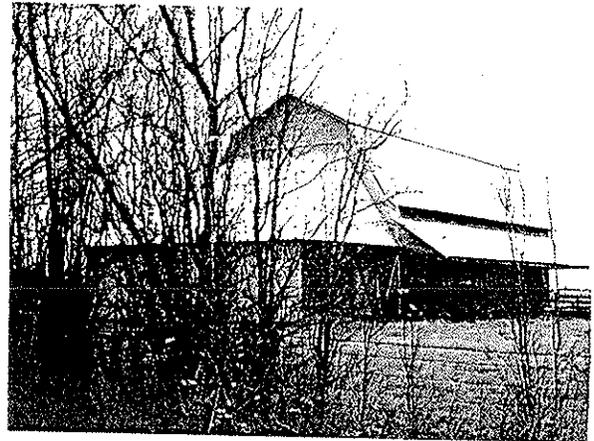
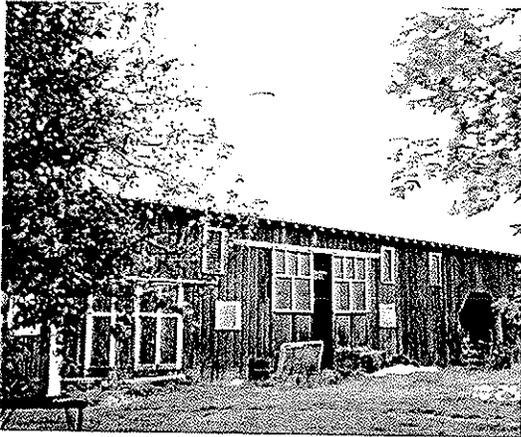


Figure 118. Church of the Brethren congregations. Lebanon, Linn County, Oregon location is the first congregation of this denomination established in the Pacific Northwest.

RELIGIOUS AND ETHNIC IMMIGRATION, 1845-1945

Figure 119. **Top Left:** Kennel Barn built in 1925 by Christian R. Kennel, a Mennonite barn builder. The use of louvers in side walls is not common in extant Linn County barns. **Top Right:** The Yoder Barn, built in 1922, by J.S. Yoder. Note the pent roof on the right side. **Bottom Left:** "Fudergang" in the J.S. Yoder Barn. **Bottom Right:** The Orville Smucker Barn built in 1946. Note the "overshoot" on left side.



RELIGIOUS AND ETHNIC IMMIGRATION, 1845-1945

Figure 120. The Michael Ryan Barn, built in 1910. Michael Ryan was a native of Pennsylvania. **Top:** Looking to the east. **Bottom:** Characteristic forebay.



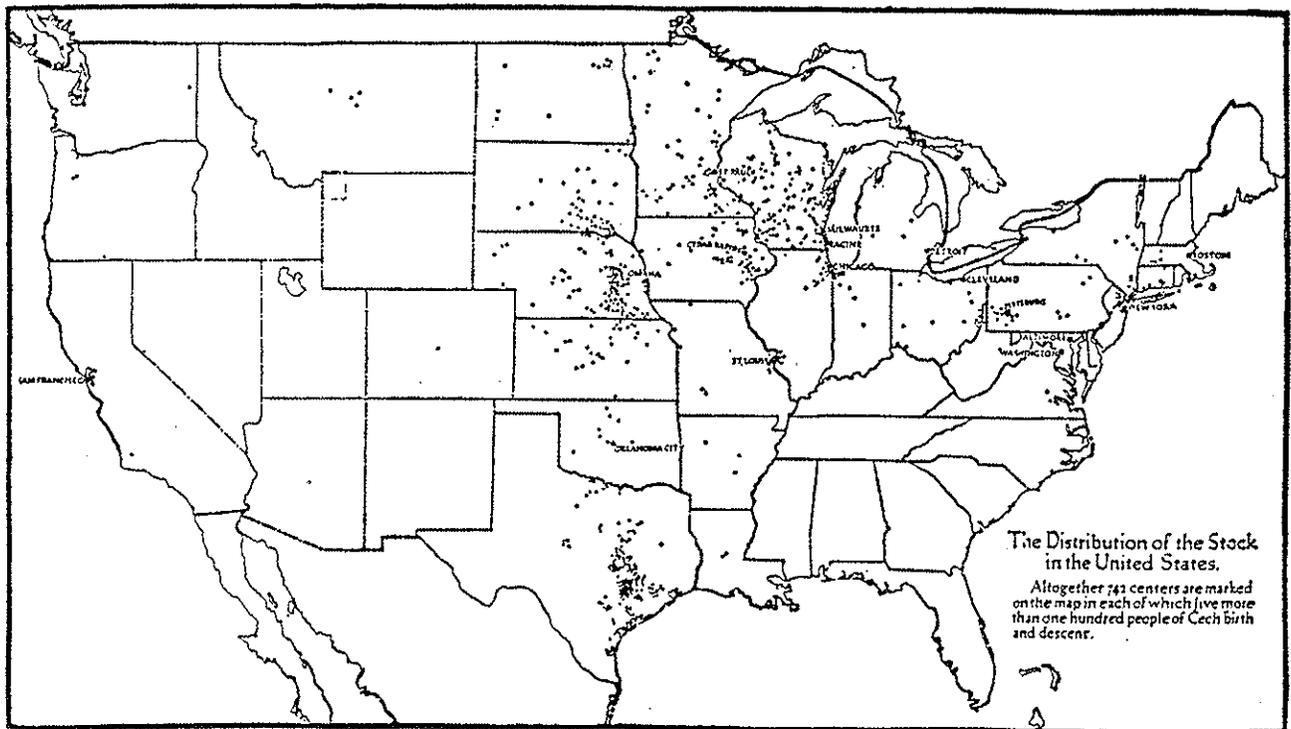
RELIGIOUS AND ETHNIC IMMIGRATION, 1845-1945

Figure | 2 |. The Charles (Carl) Foltz house and barn. The barn was built in 1884, the year in which the Catholic group, of which Foltz was a member, settled in the Jordan Valley. The house, which also dates to the 1880s, is typical of those built by members of this group but not found elsewhere in the county. Joe Foltz, brother of Charles Foltz, was the builder. The Foltz family's origins in Pennsylvania may have influenced the design of this house.



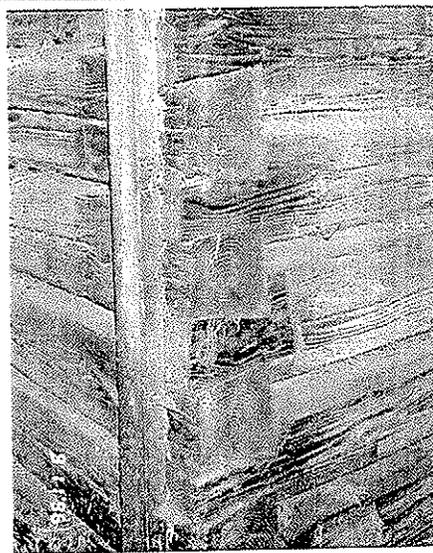
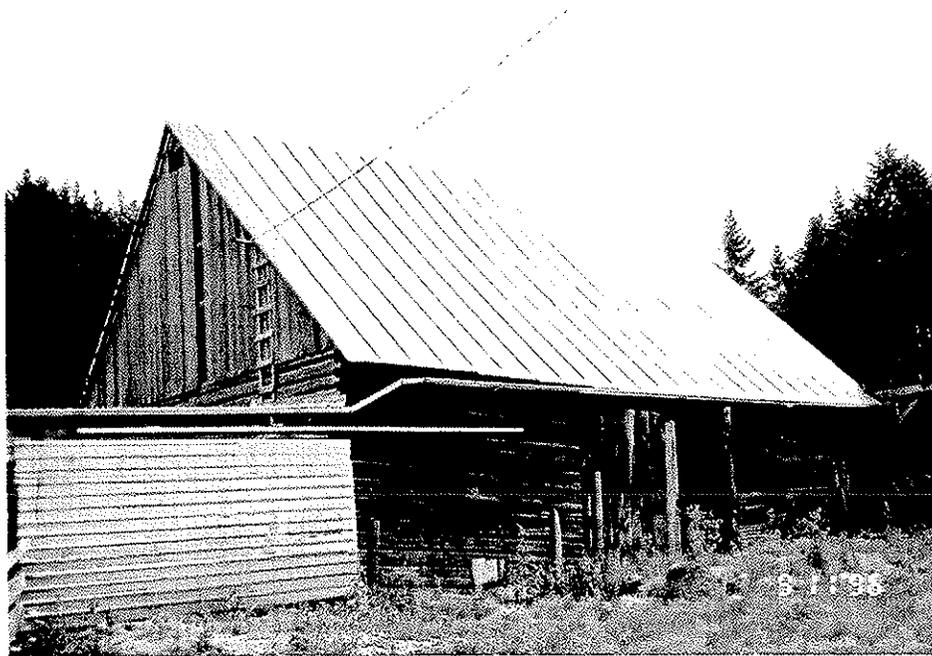
Linn County Barn Context

Figure 122. Distribution of people of Czech origin in the United States. Isolated population in northwest Oregon is in Linn County. (From: Capek, Thomas, The Čechs (Bohemians) in America, (Boston: Houghton Mifflin Company), 1920, opposite p. 60.



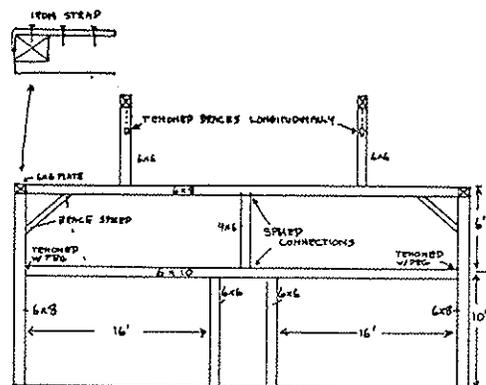
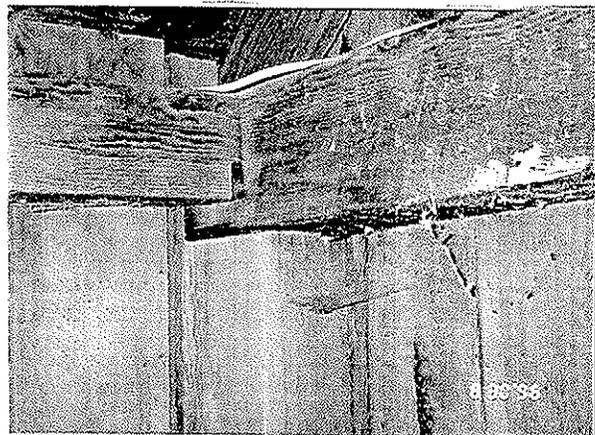
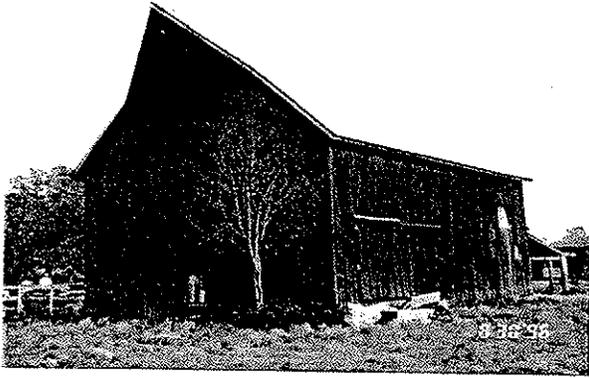
RELIGIOUS AND ETHNIC IMMIGRATION, 1845-1945

Figure 123. The Roner Barn, ca. 1900, is the only extant hewn log barn in Linn County.



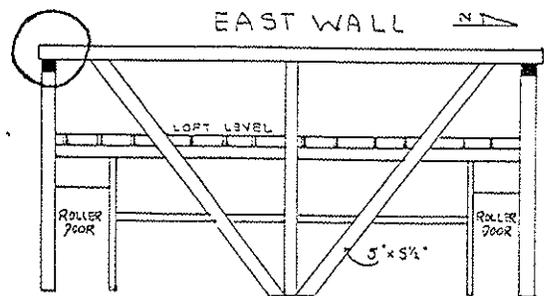
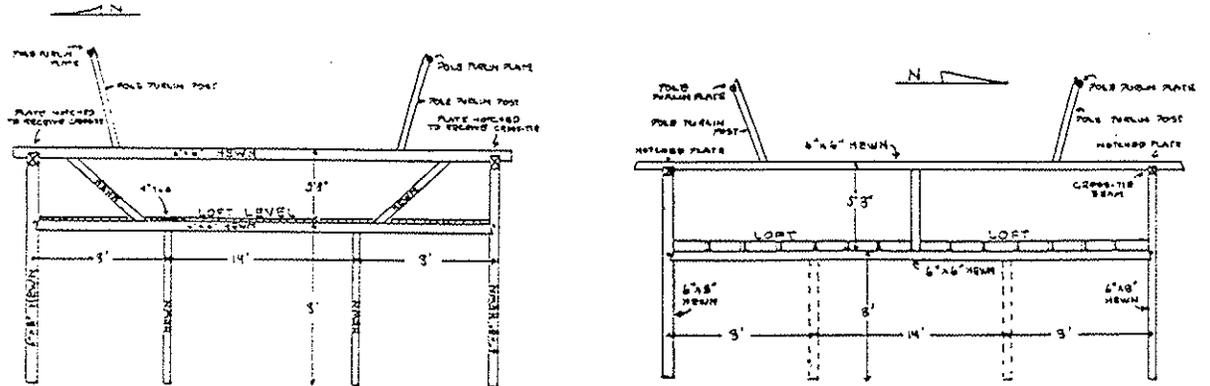
RELIGIOUS AND ETHNIC IMMIGRATION, 1845-1945

Figure 124. The Kruml Barn, ca. 1905. Tie beam-plate connection (center) is very unusual since usually this joint is below the plate. The space between the two center posts was a feed aisle. The Krumels were of Czech descent. (Not drawn to scale.)



RELIGIOUS AND ETHNIC IMMIGRATION, 1845-1945

Figure 125. Eccentric bents. It is very rare for the tie beam to join at the level of, or above, the plate. The Zeller Barn, ca. 1900. The diagonal timbers in the wall may reflect Zeller's German background. Also see Figure ____.



RELIGIOUS AND ETHNIC IMMIGRATION, 1845-1945

Figure 126 . Front transverse drive and center feed aisle plan. The Kruml Barn, ca. 1905, is 36' x 52' and has a sawn timber frame with mortise and tenon joinery. (Not drawn to scale.)

