Agricultural Resources of Pennsylvania, c 1700-1960

Northern Tier Grasslands, 1830-1960

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Conceptualization: Historical Farming Systems and Historic Agricultural Regions

Pennsylvania presents interesting intellectual challenges for the agricultural historian and archaeologist. The watchword for Pennsylvania's agricultural history is "diversity." The widespread transition to a relatively specialized monocrop or single-product system did not really take hold until after the Second World War in Pennsylvania. Beginning in the settlement era and stretching well into the 20th century, diversity of products was a hallmark of nearly every farming region as a whole, and of individual farms too. As late as 1930, the state Agricultural Experiment Station Bulletin proclaimed "the largest number of farms in Pennsylvania are the farms with some diversity of crops and livestock production."[1] According to the 1930 Federal census, nearly 53 percent of the state's farms were either "General," "Self-Sufficing," or "Abnormal" (mainly part-time) farms. "Specialized" farms were defined as those where at least 40 percent of farm income derived from a single source. These included types labeled variously as "dairy," "cash grain," "fruit," "poultry," and "truck farms."

Over time, regionalism declined in significance within Pennsylvania, yet farming across the state remained surprisingly diverse. Along with other eastern states, Pennsylvania agriculture shared in the general shift more towards specialization, commercialism, state oversight, industrialization, decline in farming population, and the like. This trend is recognized in the context narrative. However, it is

important always to keep in mind that existing literature on Pennsylvania agriculture exaggerates the degree of change before 1950. In 1946, Penn State agricultural economist Paul Wrigley identified "Types of Farming" areas in Pennsylvania. Only the Northeast and Northwest were given descriptors that implied specialization; these were dairying areas. The rest were given names like "General Farming and Local Market section." Equally significant was the fact that statewide, the top source of farming income – dairying -- only accounted for a third of farm income. To be sure, there were pockets where individual farms specialized to a greater degree (in terms of the percentage of income derived from a single product), but these were the exception rather than the rule; overall even in the mid-20th century, Pennsylvania agriculture was remarkably diversified both in the aggregate and on individual farms.[2]

Even many farms defined as "specialized" by the agricultural extension system were still highly diversified in their products and processes. This was because so many farm families still engaged in a plethora of small scale activities, from managing an orchard, to raising feed and bedding for farm animals, to making maple sugar or home cured hams. Many of the resulting products would not necessarily show up on farm ledger books because they were bartered, consumed by the family, or used by animals, or sold in informal markets. In other words, they fell outside strictly monetary calculations of "farm income." Yet they were important aspects of a farm family's life and took up a good deal of family members' time. Indeed, we can't understand the historic agricultural landscape without acknowledging these activities, because they so often took place in the smokehouses, poultry houses, potato cellars, summer kitchens, springhouses, and workshops that appear so frequently in the rural Pennsylvania landscape. These spaces might not be well accounted for (if at all) in a conceptualization that emphasizes commodity production, but they become more readily comprehensible when we take into account the broader diversity of farm productions. Another important benefit of this perspective is that it preserves—indeed reclaims—contributions that a preoccupation with specialized market commodities tends to obscure, for example those of women and children.

Acknowledging the historic diversity of Pennsylvania farm productions helps to clarify much, but it also raises a fundamental challenge for conceptualizing an approach that will faithfully convey Pennsylvania's agricultural history, and make

it possible to understand the landscape that was created as people farmed in the past. How can we make sense of this sometimes bewildering variety? Added to diversity of products we must consider a diversity of cultural repertoires; a diversity of labor systems; diversity of land tenure arrangements; varied levels of farm mechanization; 93 major soil series; ten different topographic regions; and growing seasons ranging from about 117 to over 200 days. The concept of a "farming system" was found to be particularly helpful as a framework for understanding how agriculture in Pennsylvania evolved. A "farming system" approach gathers physical, social, economic, and cultural factors together under the assumption that all these factors interact to create the agricultural landscape of a given historical era. Physical factors like topography, waterways, soils, and climate set basic conditions for agriculture. Markets and transportation shape production too. Other components, equally important but sometimes less tangible, form part of a "farming system." For example, cultural values (including those grounded in ethnicity) influence the choices farm families make and the processes they follow. So do ideas, especially ideas about the land. Social relationships, especially those revolving around gender, land tenure, labor systems, and household structure, are crucial dimensions of a farming system. Political environments, too, affect agriculture.

The idea of a "farming system" opens the way to a more comprehensive and accurate interpretation of the historic rural Pennsylvania landscape. For example, because the notion of a "farming system" includes land tenure and mechanization levels, we can identify a distinctive region in the heart of the state where sharecropping and high mechanization levels supported a cash-grain and livestock feeding system. This allows us to interpret the tenant houses, "mansion" houses, multiple barn granaries, large machine sheds, and crop rotation patterns that typify this region. Or, by including cultural forces as part of a system, we can differentiate a three-bay "English" barn from a three-bay German "ground" barn. By attending to labor systems, we can appropriately interpret the Adams and Erie fruit-belt areas that relied on migrant workers. And so on. So whether we seek to interpret German Pennsylvania, the "Yorker" northern tier, home dairying areas where women dominated, or tobacco farming in Lancaster County, the "farming system" approach is key to understanding all aspects of the rural Pennsylvania farm landscape—not only the house and barn.

Identification of Historic Agricultural Regions

Mapping done by agricultural economists in the early 20th century identified "Types of Farming" areas based on soil types, topography, markets, climate, and production. These helped to establish clear regional boundaries to the extent that topography, climate, and soil types set basic conditions for agriculture, and they also aided in identifying 20th century production patterns. However, the agricultural economists were mainly interested in production and markets; they did not take into account other important factors which shaped the landscape, especially ethnicity, labor patterns, and land tenure. For this cultural and social data, cultural geographers' work has proven valuable, because it maps information on settlement patterns, building types, ethnic groups, and even speech patterns. And finally, new maps of farm tenancy were generated for this report. Examples of these maps are reproduced below. Together, these resources were used to outline regions that allow us to avoid a "one size fits all" approach on the one hand, and the over-detailed focus on a single farm on the other.

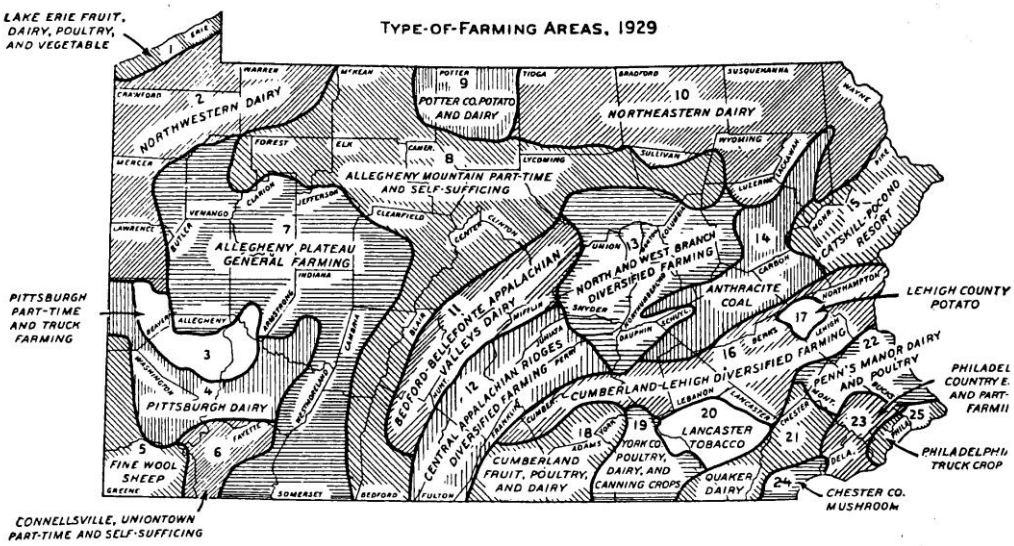
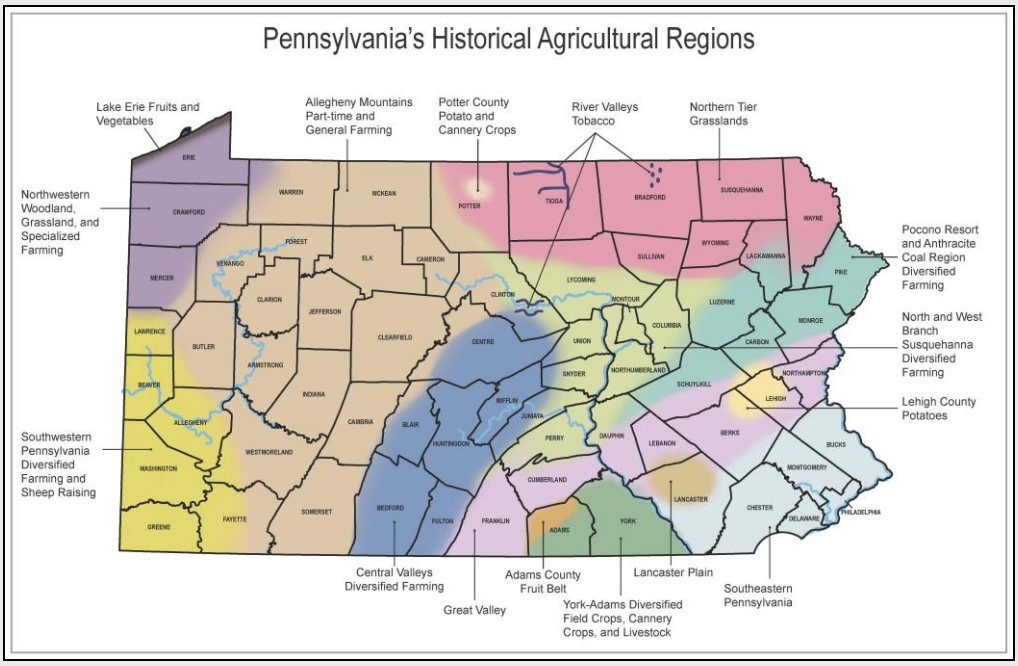


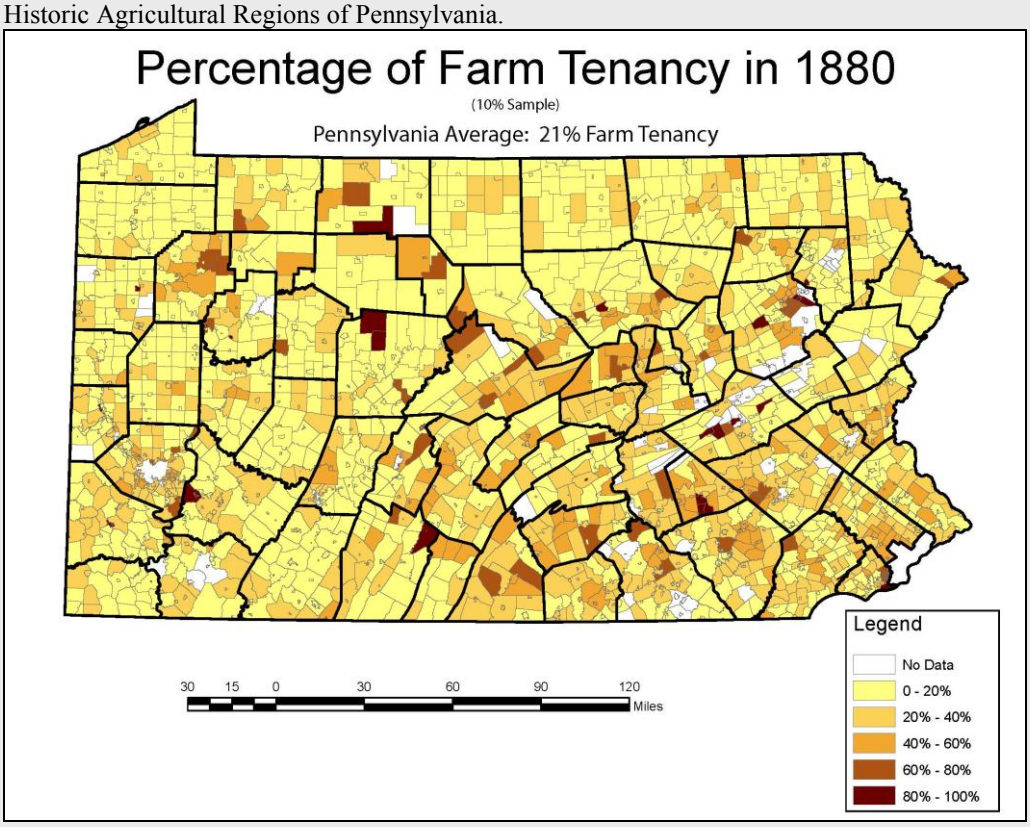
FIG. 35.—TYPE OF FARMING AREAS, 1929

Topography, soils, climate, and marketing opportunities divide Pennsylvania into 25 more or less distinct "type of farming" areas.

From Penn State College Agricultural Experiment Station Bulletin 305: "Types of Farming in Pennsylvania," April 1934.



Historic Agricultural Regions of Pennsylvania.



Share Tenants as a percentage of all farmers, 1880.

1 Emil Rauchenstein and F. P. Weaver, "Types of Farming in Pennsylvania." Pennsylvania Agricultural Experiment Station Bulletin # 305, April 1934, 39.
2 Paul I. Wrigley, "Types of Farming in Pennsylvania." Pennsylvania Agricultural Experiment Station Bulletin # 479, May 1946.

Location

The Northern Tier Historic Agricultural Region (indicated on the map included in the Introduction) includes all of Tioga, Bradford, and Susquehanna Counties and parts of Potter, Wayne, and Sullivan Counties. Properties may be evaluated under this regional context or under either of two specialty context areas located within the Northern Tier: Potter County Potatoes or River Valleys Tobacco.

Climate, Soils, and Topography

This area is characterized by cool summers and relatively cold winters (average mean temperature 44-47 degrees Fahrenheit).[1] The growing season varies; in Potter County it is well under one hundred days, but in most places it ranges between 100 and 140 days.[2] Geographers note that the climate in this section "is characterized by both the greatest annual temperature range and the largest annual precipitation range in the state," and that the soils are predominantly inceptisols of glacial origin, heavy, poorly drained, and of average natural productive capacity (though they can be improved with "fertilization and conservation practices.")[3] Topography is rolling to mountainous. The relatively short growing season is due to altitude (500-1900 feet) rather than latitude. Rainfall averages 35-45 inches per year. The Susquehanna River North Branch, Chemung River, Tioga River, and Cowanesque River are the major waterways.

Historical Farming Systems

Four historic farming systems can be identified in the region from settlement to 1960. These are the period from settlement to about 1830, the period of farm making; from about 1830 to about 1860, a diversified woodland, grassland, and livestock economy; 1860-1900, when diversified home dairying dominated; and 1900-1960, when fluid milk dairying and poultry production were emphasized. For a treatment of the early agriculture during the period of settlement, see the separate context document on early agriculture. Because the processes of occupying the land and farm making were similar throughout the twenty-four county region, and because they took place during roughly the same years, the entire area is treated as a whole for this early period.

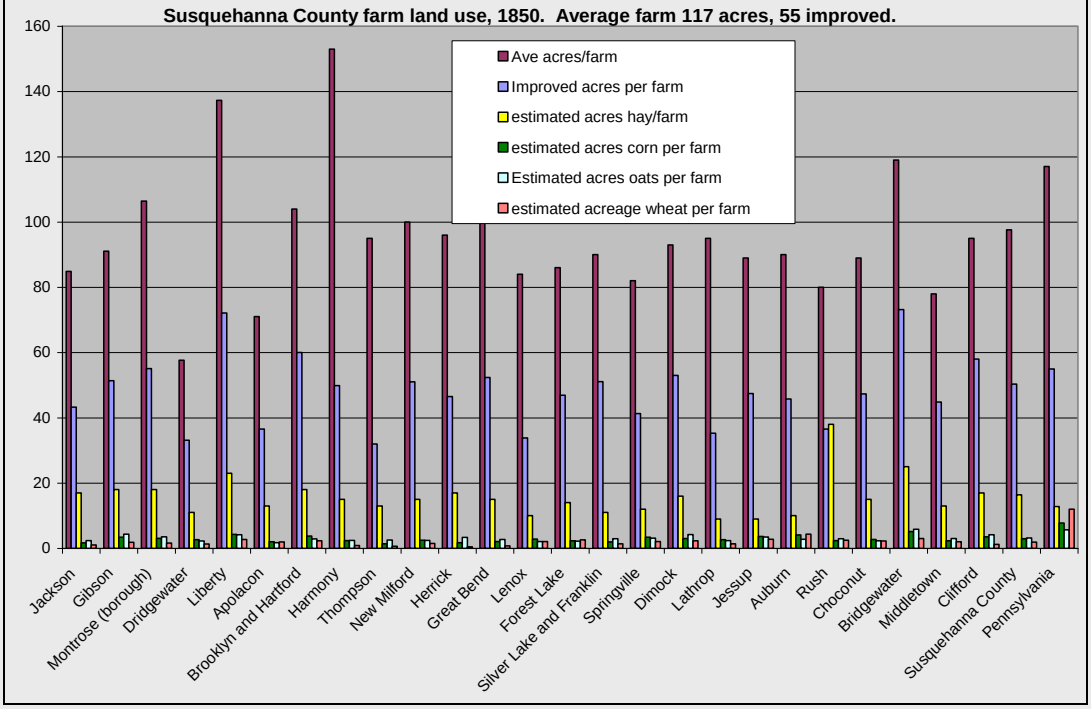
By about 1830, the farming system of this region bore a recognizably regional stamp. Grassland (hay and pasture) and animal husbandry took precedence over crop cultivation; there was little need for expensive farm implements and horses; production relied heavily

on family labor, especially women; and farming was conducted almost exclusively by owner-operators. Another factor that helped to shape the landscape was New England and New York cultural and building traditions.

A Diversified Woodland, Grassland, and Livestock Economy, c. 1830-to About 1860

Products, c. 1830 to 1860

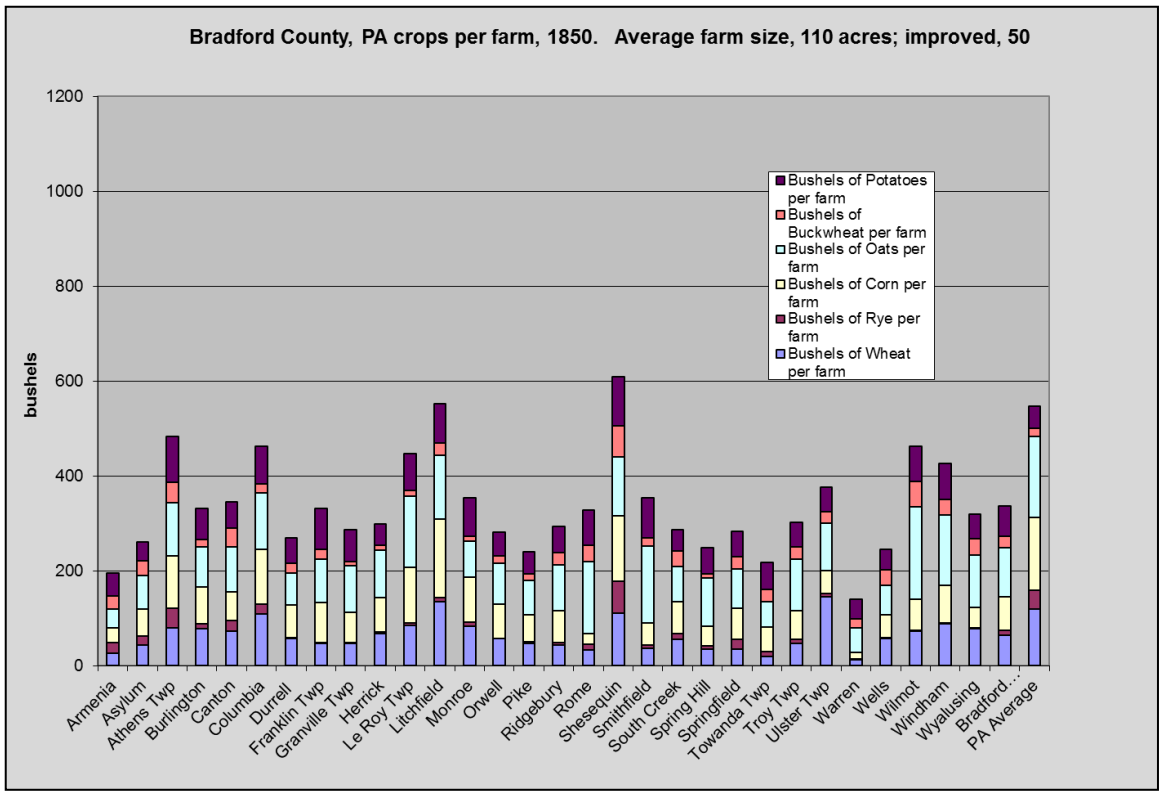
In 1845, a local farmer in Wells Township, Bradford County, reported that "very little Surplus is raised I think more is purchased for home consumption in the course [sic] of the Year than is sold of Bread Stuffs." If farm families did manage a surplus, he said, "Most of the surplus agricultural products are disposed of either at Elmira or upon the River." From Susquehanna County, reported a farmer from Choconut Township, "some little advantage has arisen from the N[ew] Y[ork] improvements particularly the Chenango Canal, and the Ithaca and Owego Rail road, by which plaster and salt have been largely introduced, and a way opened to send our butter to markets." He continued, noting that butter, cheese, and wool went out on the Chenango Canal to New York and to the "woolen manufactures in that State and New England." Moreover, he said, "our cattle and sheep are sold to Drovers, and our oats, which is the only grain sold, is sent with some little pork to Carbondale – where it is generally exchanged for coal, or bartered with the storekeepers." He continued: "Ours is not a grain growing, but a grass and cattle country." "Our corn, wheat, rye and buckwheat are consumed here, chiefly by new settlers." He concluded, "We generally have a cash market for such stock as Drovers buy. And also for our wool—our butter – and our cheese." But he complained in 1848 that the only way to get these items to market was via road: "There are no facilities, except common roads, within the county for reaching market." From Wayne County, products went to markets in Easton, Philadelphia, and New York City, via the Delaware and Hudson Canal, roads, and the Delaware River. From Pike County, surpluses were sent by teams to New York City via road and rail (the Erie Railroad). Maps of the period show these transportation lines.[4]



This chart uses yields from a mid-19th century estimate to estimate acreages in Susquehanna County and Pennsylvania. It clearly shoes that Susquehanna County farms has a much greater attention to hay, proportionally, than the state as a whole. Data for this and the following two charts taken from *Nonpopulation Census Schedules of Pennsylvania*, 1850.

Even at this point, butter, cheese, and livestock on the hoof were important in the local economy. Most township farms averaged well above the state per-farm butter production of 305 pounds.

Early boosters promoted the area's potential for grassland, and hay and pasture dominated from the start. Reliable figures on the proportion of grassland are scarce for this period, and so estimates have been made. The average Northern Tier farm had about 50 acres improved, not far from the state average of 60 in 1850. However, total field crop production was considerably below that of comparably sized farms in other regions. Even accounting for poorer yields, this suggests that less acreage was taken up with crops. And, as a percentage of improved land, hay acreage was significantly higher (20-40%) in the Northern Tier than in other parts of the state, where it typically took up around 20 percent.[5] Therefore, at the very least, grassland in the form of hay meadow was more common in the Northern Tier than elsewhere; and it is very likely that pasture accounted for proportionally more of the remainder.



Most taxable persons had horses, oxen, or both; and no one was assessed for more than five cows. Along with human muscle power, the horses and sturdy oxen furnished power. Oxen were still popular; the 1850 manuscript census shows that in some townships, half the farms still declared oxen. They suited this farming system for several reasons. Little cropland was cultivated, so plowing and cultivating were not as important as in other areas. Oxen were better suited to the hilly topography. They were part of a longstanding New England tradition. They thrived better than horses in the cold winters and could survive well on rudimentary shelter, eating just hay – they didn't need scarce feed grains. And in the end, they could become beef.

Labor and Land Tenure, c. 1830-1860

Patterns of labor and land tenure showed essential continuity from the early period. Labor was supplied almost entirely by family and neighbors. The gender division of labor was distinct, but flexible, though since dairy products were more important here than elsewhere, women's production for market was more significant. Mechanization was very low, so human labor was more important than elsewhere. Owner-occupancy was near one hundred percent by the end of the period.

Buildings and Landscape, c. 1830-1860

Houses, 1830-1860

By this period, the most common houses were small wood dwellings, often built of plank, one and a half or two story houses, sometimes with an "ell," built in Greek Revival style. Geographer Pierce Lewis has called these "upright and wing" houses. These buildings shared much more in common with adjacent New York State than with southern Pennsylvania.

Upright and wing house, Sullivan Township, Tioga County, c. 1845. Site 117-SU-005.

Upright and wing house, Westfield Township, Tioga County, mid-19th century. Site 117-WE-001.

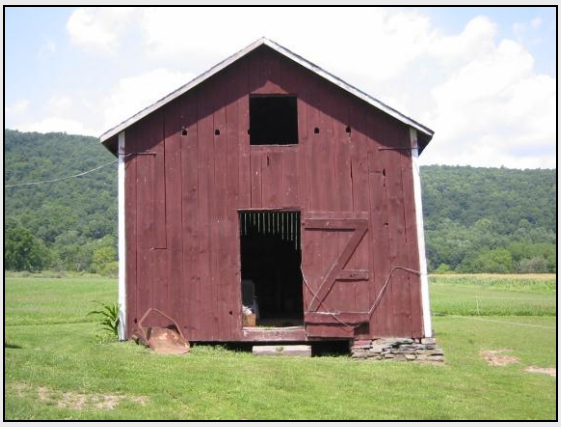
Barns, c. 1830-1860

The available evidence suggests that the "thirty by forty" or "English" barn continued to be popular in this period. (See Settlement Period narrative for discussion).

English barn , Orwell Township, Bradford County, before 1878. Site 015-OR-001.

Outbuildings, c. 1830-1860

A separate granary was not uncommon in the Northern Tier. It would be raised off the ground, to keep rodents out, and often would have tight construction and interior bins. (In the "Pennsylvania Barn" common in the southeast and central areas of the state, by contrast, granaries were usually integrated into the larger barn's fabric.) The New England types identified by Thomas Visser very much resemble the ones found in the Northern Tier. These granaries probably did not serve to store grain prior to sale, since wheat was not an important cash crop in this area. Rather, Visser notes, granaries in New England (and probably also in the Northern Tier) stored oats for animal feed.



Granary, Osceola Township, Tioga County, late 19th century. Site 117-OS-001.

Landscape, c. 1830-1860

Apart from a greater percentage of cleared land, landscape features from this period would continue features from the settlement period.

Diversified Home Dairying, 1860-1900

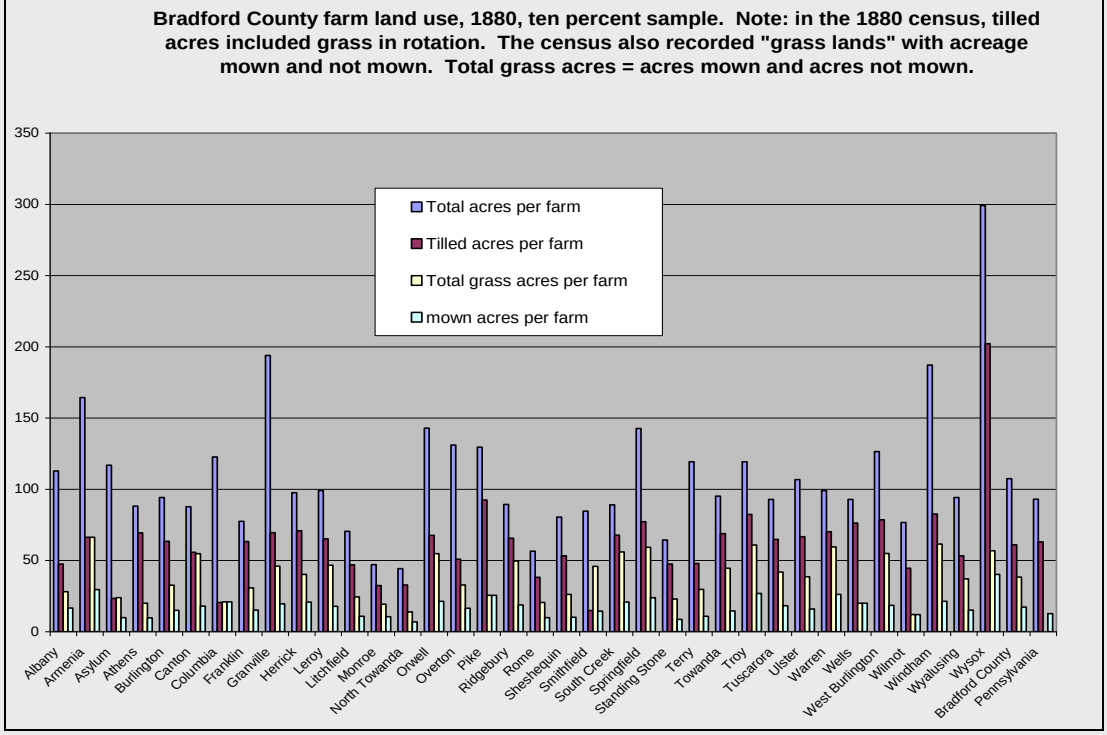
Products, 1860-1900

To summarize developments to about 1860, Northern Tier agriculture had established itself as a grassland-oriented system, emphasizing animal husbandry and woodland products. The system relied on mostly hand labor supplied by family members. Farm tenancy was low. The system's product mix and physical appearance were shaped by transportation, soil, climate, and topography, and also by the cultural heritage of New England. The "English" barn, for example, was well adapted to small-scale grassland farming, and it also derived from New England forms. Granaries and ice houses also borrowed New England forms and reflected a self-sustaining agricultural mix. The upright-and-wing house and its relatives borrowed from the popular classicism so prevalent in New England and New York State during this period.

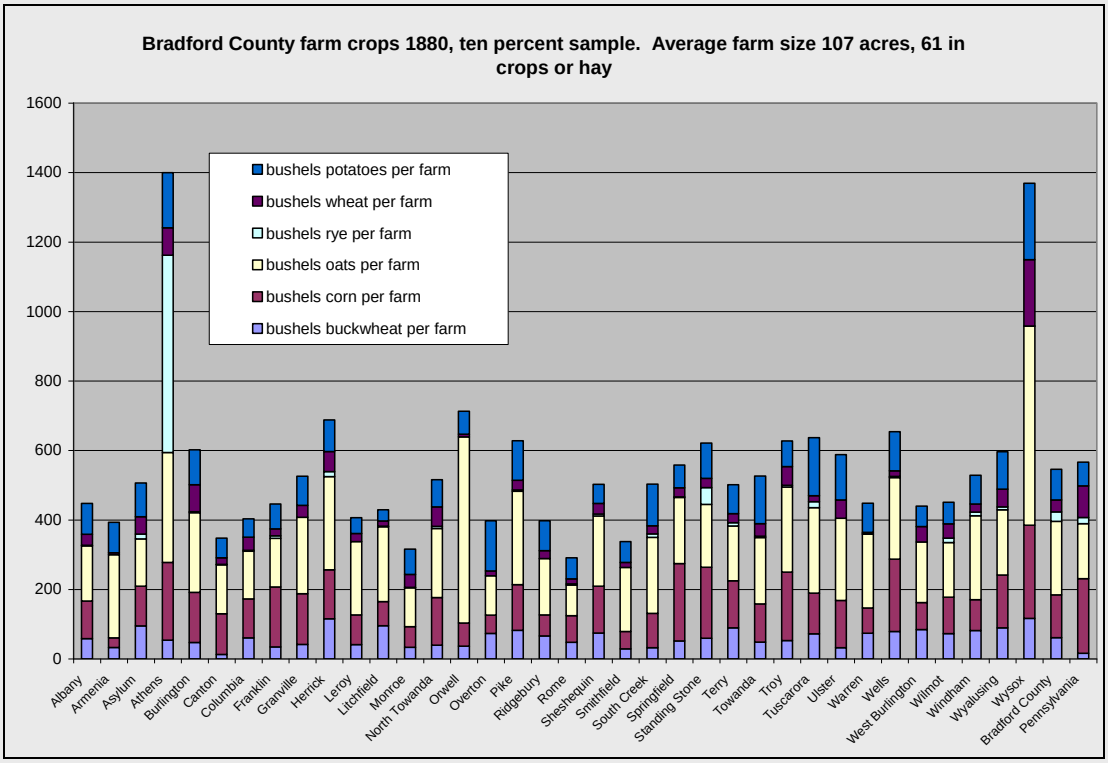
In the period from 1860-1900, the grassland system entered a new phase. The overall proportion of hay and pasture still was high, especially in comparison with other parts of the state. By the 1880s there were over 15,000 farms in the three Northern Tier counties of Bradford, Tioga, and Susquehanna. The total amount of improved acreage had doubled, and farm size averaged a little over 100 acres. The value of Northern Tier farms was still low compared with other parts of the state, but by the late nineteenth century the area caught up to the state average in mechanization, completing the shift from oxen to horsepower.[6] Possibly competition for labor from the lumber industry hastened this shift.[7] The Northern Tier region also expanded; Potter County, not farmed on a significant scale before 1850, (its population was only about 6,000 at mid-century and the county only had 600 farms) became a more integrated part of the region. The Northern Tier was situated within reach of markets in the burgeoning cities and industrial areas of the East Coast. Soon rail and canal links connected the area to New York State and New York City; Philadelphia; and the Pennsylvania coal regions.[8] In particular, rail connections expanded: the Lehigh Valley Railroad, Erie Railroad, and New York Central Railroad were the most important, but smaller companies operated lines within the region, especially to the coal areas. In response, farm families engaged in a more intensive production effort, tuning up the animal husbandry enterprise to a higher pitch. In this environment, Northern Tier farm families raised and marketed a wide variety of products. Population in the area had roughly doubled and agriculture was the primary occupation, so clearing was carried on apace. As the woods fell, so did maple sugar and

syrup production. Newly cleared areas supported crops of oats, buckwheat, potatoes, corn, and hay, while wheat production dropped from levels that were already low (see chart, farm crops). In Potter County, an 1882 survey noted, "the northern part of the county is in an excellent state of cultivation, oats, buckwheat and potatoes thriving abundantly."[9] The significance of the area's field crops is that they fit well with the climate, soil, and market conditions. Oats, corn, and hay fed farm livestock. Hay was also grown for sale; in the wintertime, farm people loaded baled hay on their sleds and took it to railheads for shipment to the cities or industrial areas, where it was fed to animals that worked in mines and on city streets.[10] Buckwheat, a short-season crop, responded well in the unpredictable and cold weather; it also supplied important nutrients to the glaciated soils, could be fed to animals, made a popular flour, and even complemented honey bee culture.[11] (The Northern Tier counties were the state's biggest honey producers in 1900.) Potatoes, also, grew well under the prevailing soil and climate conditions, and became an important cash crop to be marketed in the coal regions. They too could be fed to animals. All cultivated crops in this system had multiple uses: on-farm consumption (by people or animals); sale for cash; trade with neighbors. An 1886 history of Wayne County also mentioned apples and turnips as items that were marketed to cities.[12] Tobacco was raised on a limited scale.[13]

On a typical late 19th century farm here, pasture, meadow, and hay in rotation would take up at least half of a farm's improved land (see chart below, Land Use). The overall proportion of land devoted to grazing and forage was probably even higher, because many animals still grazed in wooded areas too. These proportions contrast strongly with areas of Pennsylvania that emphasized grain, where perhaps only a quarter of improved acreage would be devoted to grass. In short, Northern Tier cultivated lands should be regarded as part of a livestock system rather than intended for crop production in its own right. Indeed, the system was quite extensive, in that each animal had several acres of pasture, and hay yields averaged a ton or less per acre.[14]



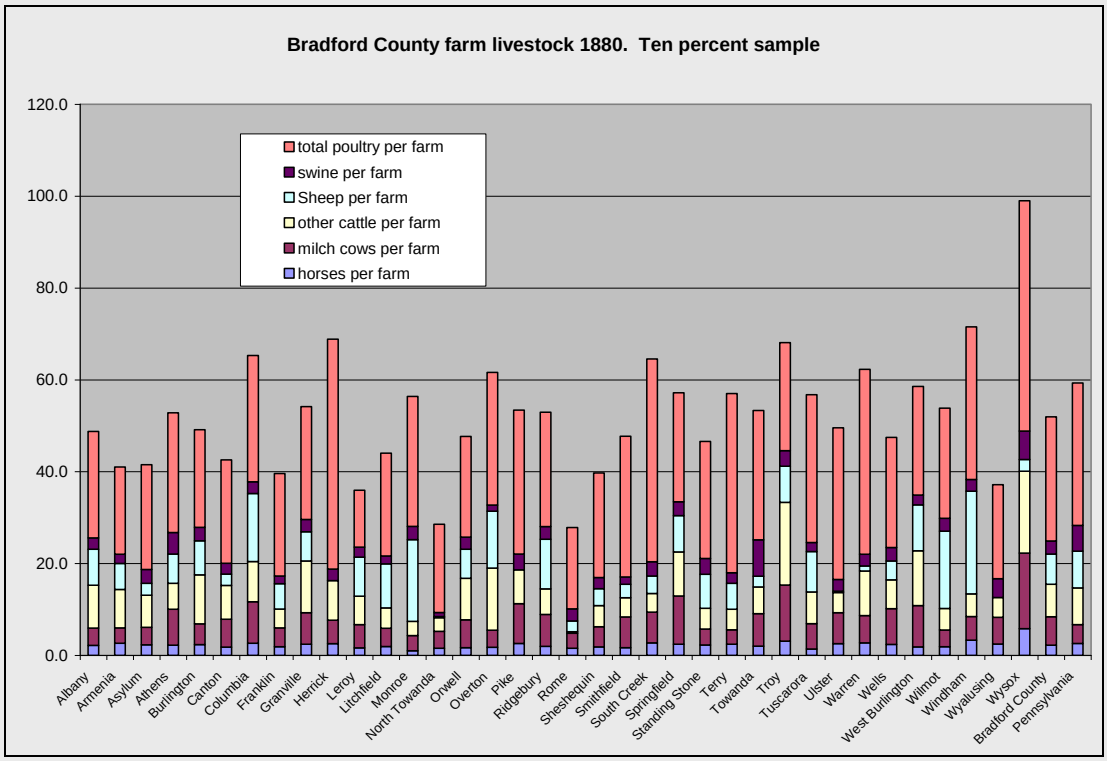
Bradford County Farm Land Use, 1880.



Bradford County Farm Crops, 1880.

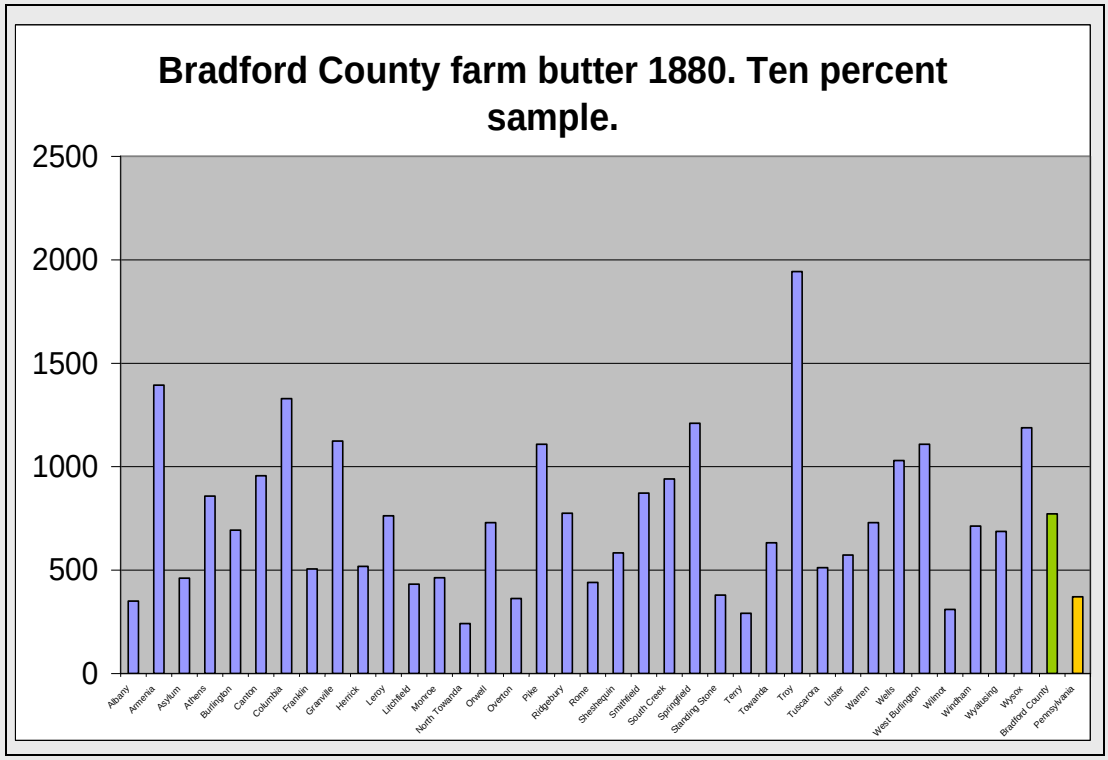
Livestock and its products constituted the core of the late-19th century farm's enterprise (see
charts, livestock and butter). Cattle were chief among them. The 1880 manuscript agriculture census shows that most farms had between six and twenty milk cows, and often as many other cattle. Animals were still sold to drovers; the Bradford County atlas of 1869 lists quite a few livestock dealers. Farm-made dairy products dominated. Butter production tripled between 1850-70, and by about 1880 Bradford County farms alone averaged over 700 pounds of butter per year; it was not uncommon for a single farm to produce over a ton of butter. Residents and boosters proclaimed Northern Tier butter to be of very high quality, comparing the area to New York State's famous Orange County. Historian Emily Blackman pronounced Susquehanna County the "butter county of our State." Farm-made butter went mainly to New York City, but also to Philadelphia and to the coal regions.[15] As of 1880, very little milk was sold in fluid form, either for direct consumption or to creameries (centralized butter making facilities).[16] Cheese was made on a few farms, and after about 1870 in factories, but cheese production was never very high in this area. [17]

Among secondary livestock enterprises, poultry raising occurred on a small scale (a dozen to four dozen hens). Chickens, of course, were raised for eggs and meat, and some farm people raised turkeys too. A few hogs were probably kept to be fattened on skim milk—but pork production was low compared with other areas of Pennsylvania. Sheep raising also dwindled into relative insignificance, faced with western competition and low wool prices.



Bradford County Farm Livestock, 1880.

All in all, "competency" is a period word that describes agrarian aspirations in the Northern Tier, if not actual achievements. The word was an elastic one – it connoted more than a bare sufficiency, but also carried values that abjured consumption and acquisition for their own sake. Rather, a competency consisted of a comfortable living.[18] Northern Tier farms were not necessarily "prosperous" in the same sense as their southeastern Pennsylvania counterparts, or of the developing farm economy in the Midwest. The soil was poor; the climate was challenging; and land values were low.



Bradford County Farm Butter, 1880.

However, in this period, the Northern Tier farm families were able to take advantage of their access to dairy markets, and many were able to achieve a competency through this form of livestock husbandry. If their resources were limited, so were their outlays; access to land was freer than elsewhere, and the need for expensive machinery and labor was low.

Labor and Land tenure, 1860-1900

Tenancy rates were among the lowest in the state, between 10 and 15 percent; arguably the Northern Tier was a prime example of "yeoman" country. The term "yeoman" in the nineteenth century customarily referred to an independent, landowning farmer. Land values were comparatively low, but perhaps that helped young people to acquire farms.[19]

Making a gilt-edge dairy product for city markets demanded considerable skill and organization. Butter making was women's work, but dairying required extensive cooperation among all family members, still the primary source of farm labor in this period. (A few farms hired wage labor, but seldom even a year's worth.) The gender division of labor was fairly predictable, but nonetheless flexible. Men plowed, cultivated, and harvested (switching over from oxen to horses in this period); but, as always, women participated in these jobs at times of peak need. Women also weighed in on matters of

animal feed and pasture grasses. In general, because grassland farming de-emphasized field crops, field labor was less important than in cropland systems. Work with animals, by contrast, was more intensive and more sustained than in a crop system (where bursts of work punctuated slow periods). Feeding, housing, herding, milking, and cleaning up after milk cows claimed a great deal of attention – but in this period, milking was not the year-round grind that it later became.[20] Ice harvesting should probably be counted as part of dairying labor. Beef animals were usually grass fed in the summer, but needed feeding and attention in the winter. Since dairying was a seasonal occupation pursued from about April to October, winter feeding could fit nicely into a seasonal routine.

The actual work of butter making was quite exacting. First, of course, the cows had to be milked. According to the farm press, New England custom assigned milking to men; though "on the ground," it seems that women sometimes milked. Most likely milking took place in the barn or stable, and later with animals confined into new-style "stanchions," adopted in the late 19th century. The milk was carried in pails to a cool spot, such as a spring house or dairy house, where it was poured into shallow pans set on shelves. The cream would rise to the top; then it would be skimmed off and churned into butter. The dash-style churn was the most popular, though inventors never ceased in their search for an improved churn. Sometimes the churn was powered by a dog on a treadmill. Once the butter "came," it was removed, "worked," salted, and packed for market. It was stored in a cool place if not sent immediately to market.

Farm work was aided by new types of machinery. The average value of implements per farm had crept up to the state average, after lagging in the earlier period. Mowing machines were probably the most important, given the large hay crops, but fanning mills, hay rakes, hay forks, tedders, hay presses, etc also were increasingly common.

Some primary evidence suggests a notable shift in the gender division of labor on Northern Tier farms. For example, Bradford County resident Ada M. Warner's diary records working "at the Barn", "worked in haying," "packing "Butter", butchering hogs, churning berrying, building straw stacks, and cooking for threshers.[21] Certainly, dairying was increasingly demanding for both men and women, but it is likely that the work intensified more for women than for men. Some contemporary commentators thought that men's labor was greater in grain-based farming. An outbuilding type on farms of this period is the workshop, raising the question of whether since agricultural labor was so dependent on women's skills, men contributed to the household competency through artisan skill such as blacksmithing.

Buildings and Landscapes, 1860-1900

The farm culture and economy in this period produced a landscape that was enriched compared with its rather spare predecessors. House form and style still revealed a strong New England/New York influence. The "basement" barn, kitchen ell or detached dairy kitchen, and ice house all indicated the primacy of home dairying. Separate granaries, wagon houses, and carriage houses were needed to accommodate horses and their provender. Machine sheds accommodated increased mechanization. And workshops housed ancillary enterprises. Landscape patterns would show a much more open scene, with cleared land right up to the tops of the many hills; small enclosures for pasture and hay; woodlots; and patches of cropland.

Houses, 1860-1900

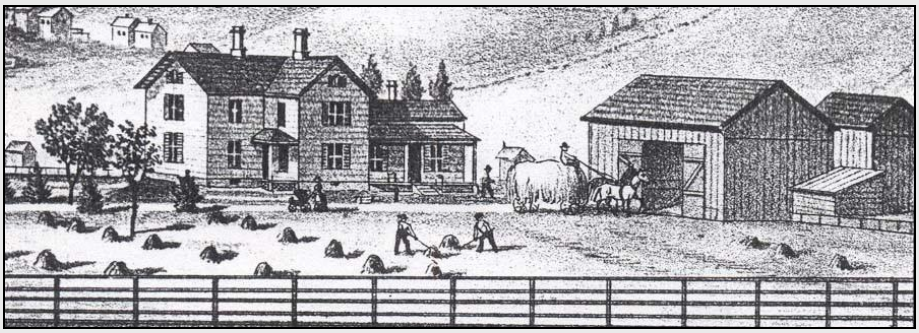


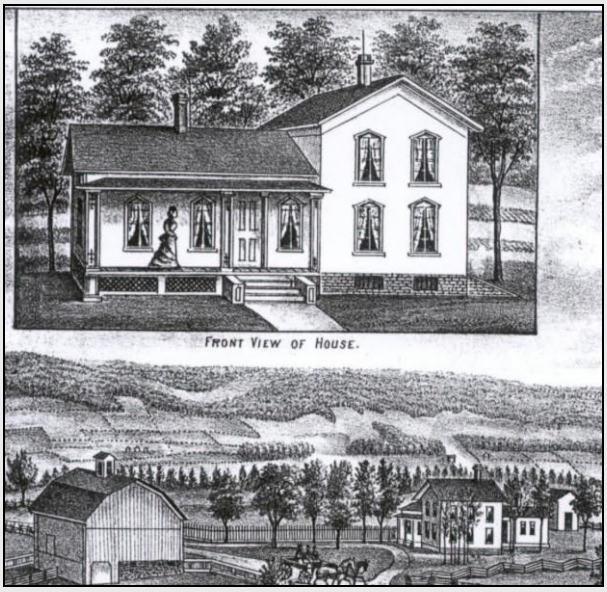
Figure D. J. Butts Farm, near Mansfield, Tioga County, c. 1882. David Crafts, History of Tioga County, 1897. This engraving shows some key characteristics: the frame house with not one but two ells; one-story kitchen ell with porch and ridge chimney; English barn; dooryard work space.

The comparative prosperity of this era was reflected in housing. By this period, most farms would have a substantial frame house, usually of two stories and two rooms deep, often with an "ell" extension to the side and/or back. Classical lines and gabled roofs still seemed to predominate, with entrances either in the eaves side or gable end. An occasional Italianate four-square with hip roof appeared. Trim occasionally revealed the prevailing Victorian taste of the period.

It is very important to remember that farmhouses were workspaces, and they are properly considered as an integral part of the entire farmstead. The kitchen "ell" was a significant architectural feature.[22]

House with kitchen wing, Stevens Township, Bradford County, c. 1860. Site 015-ST-001.

One and one-half story house with kitchen ell, Brookfield Township, Tioga County, c. 1860-75. Site 117-BR-001.



William Bates House, Canton, Bradford County. David Craft, History of Bradford County, Pennsylvania: (Philadelphia: L.H. Everts & Co., 1878).

This photo, taken c 1920, of the Mudge and Holly families of Gray Valley Road, Tioga County, shows the two-story "L" shaped frame house, the single-story ell kitchen wing, and wood house.
http://www.rootsweb.com/~srgp/photos/mudgefrm.htm, accessed 7/11/06

The kitchen ells so common on these houses bear close examination. Most are a single story. All have chimneys, some of which are located on the gable end of the ell, but most of which sit midway along the ell's roof ridge. The eaves-sides are pierced by several kinds of openings, and just as significantly, are often blank at strategic points, probably indicating storage or cooling facilities. The openings consist of windows, doorways, and recessed porches. Comparing these to their probable New England antecedents,[23] we find some highly suggestive similarities. Thomas Hubka analyzes the "ell" in the New England connected farm as an outgrowth of what he calls a "farm factory," that is of an intensified family farming (late 19th century) in which efficient organization of women's work in kitchen ells was an important feature. Often the ells contained a "set-kettle" (located somewhere in the middle, and thus dictating the ridge-top chimney location), stove, washroom, and milk room. This could explain the appearance of Northern Pennsylvania ells, too. Sometimes a woodshed filled out the end – and again, the 1878 engravings suggest the same sequence of "Big house, Little house," followed by a woodshed. Finally, also taking a clue from Hubka's analysis, we should consider that the area enclosed within the "ell" functioned as a dooryard workspace.

Barns and Outbuildings, 1860-1900

The Tioga County reports to the state Board of Agriculture for 1860-63 mention the E. Bentley farm in Tioga Township as having barn, stables, wagon house, granary and workshop. It reported that William Wass in Chatham Township had a stable, wagon house, barn, and shed. The state board of agriculture paid the most attention to high-end farms, but fieldwork and illustrations suggest that many farms, if not most, had a complement of outbuildings. These relatively small buildings functioned to store feed (granary, corn crib); store equipment (wagon house, machine shed); store carriages; and provide space for workshops.

Barns, 1860-1900

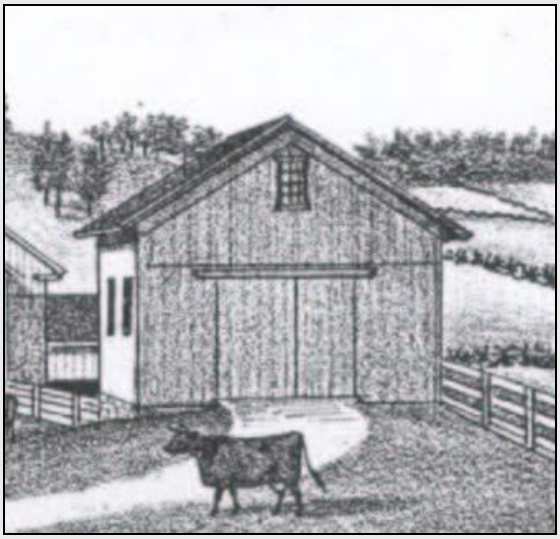
Barns underwent significant transformations in this period to accommodate larger numbers of livestock and the increased importance of dairying. Barns show a range of solutions to the labor and shelter demands of the expanding system. Images in the 1878 Craft county history of Bradford County show the English barn expanded via shed additions, ells, and even adding a second English barn to the gable end.[24]

English barn with ell, Westfield Township, Tioga County, 1881. Site 117-WE-002.

Gambrel roof English Barn with ell, West Burlington Township, Bradford County, c. 1850 with later 19th century alterations. Site 015-WB-001.

A more popular solution consisted of creating a multi-level barn. This could be done in several ways.

The Gable front bank barn (Thomas Visser's term, also called gable-entry banked barn by geographer Allan Noble) reflected both the rise of dairying and increasing cost of labor. Cows, manure, granary, and occasionally roots (for feed) would be situated on the ground floor. The stalls or stanchions were usually arranged lengthwise (i.e. parallel to the roof ridge), in two rows flanking a central aisle (cows usually faced outward, but in some barns inward). On the upper level, hay and machinery were stored. A large gable-end entry sometimes provided easy access, while gravity aided feeding hay to the stables below. Examples in the Craft history appear in the illustration of William Campbell's and Barker Brown's farms in Bradford County.



Gable entry bank barn, William Campbell property, Litchfield Township, Bradford County. David Craft, History of Bradford County, Pennsylvania: (Philadelphia: L.H. Everts & Co., 1878).

Gable entry bank barn, North Towanda Township, Bradford County, c. 1875-1910. Site 015-NT-001.

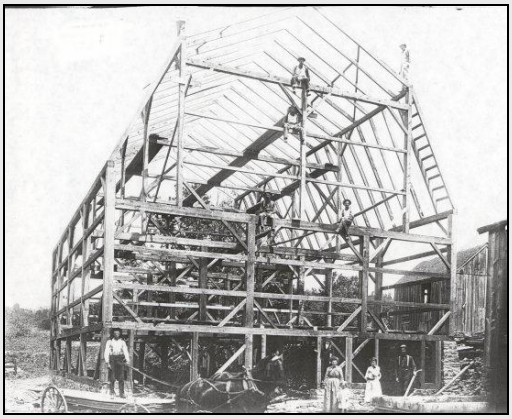
Gable entry bank barn, Burlington Township, Bradford County, c. 1875. Identified as the Josephus Campbell property in the 1878 county history. Site 015-BU-001.

Basement barn, Bradford County, c. 1910. Photo-only site, no site number.

More popular was the Northern Basement barn, also called the "raised three-bay" or "basement" barn. According to Henry Glassie, who surveyed barns in Otsego County, New York, these are "one-level barns [i.e. English Barns] built up on basements" and usually have a road-level entrance in the eaves side. The lower level usually has a lengthwise central aisle, and stanchions for dairy cows. Sometimes there would be doors in each gable end. Off center windows in the gable can indicate where the stable area is located.[25] The most common location for these barns was across the road from the farmhouse; the entrance was just off the road. Fieldwork by Glenn Trewartha found these patterns in a 1948 survey, and they also appeared at sites examined for this survey. These barns frequently had gambrel roofs for extra hay storage, even in the 19th century. They are different from the "Pennsylvania Barn" in that they lack the projecting "forebay"; are generally smaller; often have gambrel roofs; often originally had lengthwise stall arrangements; and usually are located right up against a road. And, importantly, the lower level is not banked but instead extends underneath the entire length and width of the building.[26]

Basement Barn, Troy Township, Bradford County, c. 1880-1910. Site 015-TR-002.

A derelict farm near Canton, Bradford County, showing a house with multiple wings and Northern basement barn. Photographer: Paul Carter. 1936. FSA/OWI collection of photographs, Library of Congress. Digital ID: fsa 8c51747.



Clymer Township, Tioga County, barn raising, c. 1902. This image shows clearly how the basement barn ground floor extends the entire length and width of the ground level. Photographer, L. Jackson. http://www.rootsweb.com/~srgp/photos/barnrais.htm, ac

Woodshed and Wood houses, 1860-1900

Fieldwork did not locate any separate woodsheds, though historic images show woodsheds attached to kitchen ells.

Ice House, 1860-1900

Ice houses were important in the pre-refrigerator days, especially for dairying. Diagnostic features (according to Visser) include thick walls and lack of windows; location near dairying buildings or house.[27]

Root Cellar and Ice House, Asylum Township, Bradford County, 20th century. Site 015-AS-001.

Sugar House, 1860-1900

These would be located in the sugar bush. No sugar houses were found in fieldwork.

Poultry House, 1860-1900

There would have been increasing numbers of poultry houses on Northern Tier farms in this period, but it is hard to date extant ones, and most appear to date from the 20th century.

Privy, 1860-1900

These too were essential buildings but again few extant ones date before 1900.

Granary, 1860-1900

Extant granaries were found on a number of Northern Tier sites. Based on materials, proportions, framing, and other architectural characteristics, many of these appear to date from the late 19th century. These buildings tend to lack windows; they are raised on posts, and open underneath to deter vermin. Thomas Visser characterizes the typical New England granary [for storing oats for workhorses] as was one and one-half stories

high with a pass door on the gable end and a loft door above that.[28] A pass door is a door that is elevated above ground level (so that heavy bags, etc can be offloaded down onto a waiting wagon). Northern Tier granaries surveyed match this description well. They also tended to be located typically with gable end facing the road, closely. The resemblance to New England prototypes reveals another case of New England's cultural influence on Northern Tier agricultural buildings.

Granary, Burlington Township, Bradford County, c. 1875. Identified as the Josephus Campbell property in the 1878 county history. Site 015-BU-001.

Granary, Eulalia Township, Potter County, late 19th-20th century. Site 105-EU-001.

Wagon Shed, 1860-1900

Wagon sheds would be gabled sheds with open sided bays, often a single story. This would reflect the rising (though still only average) role of machinery in the farm operations. Probably mowers were most significant during this period, but there would be a modest complement of other equipment.

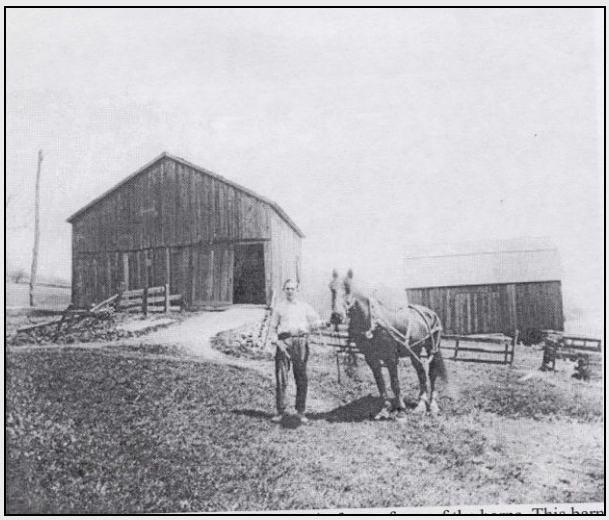
Wagon shed, Morris Township, Tioga County, c. 1900. Site 117-MO-002.

Wagon, wood, and implement storage buildings, Rutland Township, Tioga County, late 19th century. Site 117-RU-002.

Carriage House, 1860-1900

According to Visser, early New England carriage houses were "distinguishable by their large hinged doors, few windows, and proximity to the dooryard."[29] A carriage house would not usually be as large as a barn, and it might sit on the same side of the road as the house; also, carriage houses not uncommonly had some ornamental architectural trim that would not always appear on a barn. Interiors (originals that is) would have large stalls, a hayloft above.

Carriage houses are not as common as other outbuildings in the Northern Tier. Wealthier families would likely have built them.



Harold Mudge carriage house, c. 1920. This photo depicts Harold Mudge of Gray Valley Road, Tioga County.. Based on Visser's description, the building in the left background would seem to be a carriage house. http://www.rootsweb.com/~srgp/photos/mudgefrm.htm, accessed 7/11/06

Shop, 1860-1900

Farm shops were not uncommon features of Northern Tier farmsteads. They probably relate to the common practice of supplementing agricultural income by working at a trade or service. For example, in the Sullivan Township, Tioga County Directory of 1899, the following listings appeared: "farmer and mason"; "farmer and hay presser"; "carpenter and farmer"; "postmaster and dealer in general merchandise, farmer." The Rutland Township Directory for 1899 listed a physician and farmer; "wood grower" and farmer; "town auditor" and farmer; "manufacturer iron ore paint and farmer"; dealer in agricultural implements, as well as carpenters and blacksmiths.[30] Dairying at this time

was still seasonal work, even though the milking season was longer, cows still were allowed to dry for a few months before calving in the spring. So, many if not most farmers supplemented their income. Diagnostic features of a workshop include chimneys (indicating a forge or heater); access to road; large gable end doors (for ease of entry); and multiple windows (for extra lighting).

Workshop, Pike Township, Bradford County, c. 1900. Site 015-PI-001.

Honey Colony 1860-1900

These likely were ephemeral; none were found in fieldwork.

Corn crib, 1860-1900

Corn was not a very important crop per se in the Northern Tier, but corn was used for animal feed, and so corncribs are found. Most are relatively small (especially when compared with those in the Susquehanna North and West Branch).

Corn crib, Osceola Township, Tioga County, date unknown. Site 117-OS-001.

Landscape Features, 1860-1900

Field Patterns

By the late nineteenth century, the cleared area in Northern Tier farms was approaching three-quarters; and at least three quarters of the entire land area in Bradford, Tioga, Susquehanna, and Wayne Counties was in agriculture. So the landscape was quite open and would have presented a patchwork of small, square-shaped fields. Pasture and meadow would have been the most predominant landscape features. "Permanent" pasture would be areas that were not plowed, but used periodically for grazing. More research is needed to determine their appearance and overall proportion to the larger enterprise, but to date we can say that in the 19th century these would be fenced fields that showed the impact of grazing animals: close cropped, with many varieties of grasses and other forage plants. Unpalatable plants would be left untouched and thus pop up randomly; possibly there would be a clump of trees for shade. Somewhere there would be a water source. One observer in 1899 put it colorfully: "agriculture has shaven these hills to their very crowns, leaving only here and there a tuft of woods for a scalplock."[31] Meadow would be more like cropland, sown with grass seed and harvested for hay. Haystacks would have been a common ephemeral landscape feature. Overall, the land in this period probably had a somewhat scruffy look, even though much of it was cleared; commentators of the period noted the extensive (as opposed to intensive) nature of the grazing practices, that is to say that there were comparatively few animals for the amount

of cleared land.[32] This extensive system reflected the available resources: the soil was poor, farm families lacked the labor and financial ability to fertilize (pastures especially); so they let their animals loose to fend for themselves on a comparatively large acreage, rather than expend labor and cash to graze cattle on smaller, more productive pastures.

Fences

As clearing proceeded, stake-and-rider, or post and rail fencing continued to be put up; as more labor became available, stone fences were also built to divide fields and pastures. The Tioga County reports to the state Board of Agriculture mentioned these in the 1860s. These fences were important landscape features. In the first instance they represent the cultural legacy of New England. They often evolved from split-rail fences, having been built from the piles of stones placed in the "V" of the wood fence. An 1871 survey concluded that probably a third of fences in this area were of stone. There are still unanswered questions about these fences, such as who built them.[33] Clearly fences served important symbolic purposes. They also served purely utilitarian needs in a largely pasture based cattle-based agrarian economy. Today few traces remain; many have been cannibalized for other purposes.

The earlier types of wooden fences (see above) would continue along with the new stone fences; and toward the latter part of the period, types of barbed wire or wood-and-wire fences would appear; these are more fully described in the section on the 20th century. A hierarchy of fencing also dictated that near the house, picket fences would enclose yards, while fencing types became rougher as one moved out into the fields and pastures.

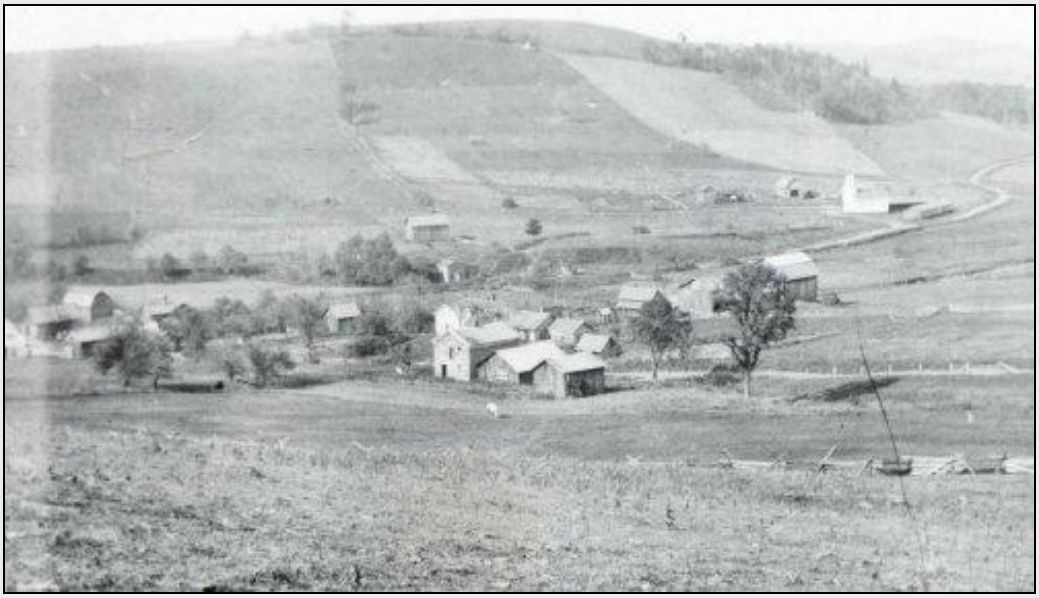
Pastoral Place Names, Fish Farms

An interesting phenomenon in the Bradford County Atlas of 1869 and the Susquehanna County Atlas of 1872 is the frequency of romantic, mostly pastoral place names.[34] Farms were labeled with names like "Quiet Home," "Pleasant Farm," "Orchard Home," and even "Infidel Home." Another, perhaps minor, type noted in the 1869 Atlas is the fish farm. Several of these appear, for example in South Creek Township, "Crystal Spring Trout Ponds," "Trout Brook Farm," etc. The significance of these places is not clear.

Wood Lots

Wood lots were still an integral part of the farmstead. Many times they would be square-ish in shape, because surrounded by pasture and meadow fields. They occupied a much smaller proportion of the farmstead land area than before.

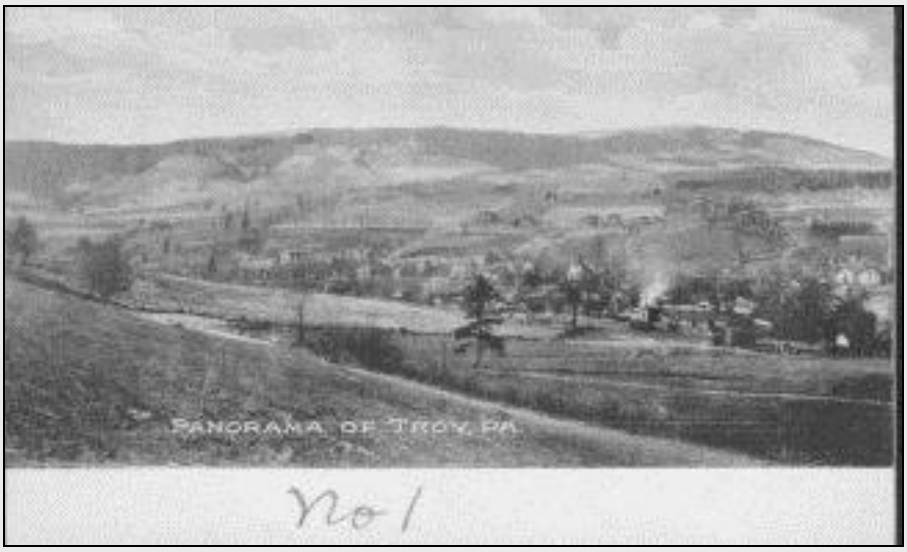
Liberty, Tioga County, 1907. Note worm and wire fencing; English barn in center foreground, with shed extension. http://www.joycetice.com/1900/liberty.htm, accessed March 6, 2012. Submitted by Phyllis Hughes-Marino.



Elk Run area, Sullivan Township, Tioga County, c. 1898. Note cleared fields up to ridge; worm and wire fencing; ground level barns and at least two gambrel roof basement barns. http://www.rootsweb.com/~patioga/cemsull.htm, accessed 7/11/06

Binder, Tioga, Bradford County, no date. Submitted by Brent Boyer and displayed at http://www.joycetice.com/1900/farmach..htm. Accessed March 6, 2012.

View near Terrytown, Bradford County, no date. http://www.joycetice.com/new/new0112.htm. Accessed 2004.



Panorama of Troy, PA, no date.
http://www.rootsweb.com/~srgp/booksb/troypan.htm, accessed 7/11/06

Sugar Bush

No documentation is available at present.

1900-1960: Fluid Milk and Poultry

The next phase in the Northern Tier production system began around the turn of the twentieth century. Rural population was already declining in the late 19th century, as lumbering and mining declined, but the number of farms actually did not peak until sometime in the first decade of the twentieth century. This trend coincided roughly with a major shift from diversified farming and butter making to relatively specialized fluid milk dairying. After 1910, farm numbers dropped and average farm size rose as farm families adjusted to new circumstances. Depression conditions starting in the 1920s buffeted agricultural communities. Many farms had negative labor incomes, and young people continued to migrate out of rural areas, unable to find enough economic opportunities to sustain them.[35] The New Deal of the 1930s injected the federal government into farm policy in a big way, introducing price supports, set-aside programs, rural social-service agencies, and aid for rural electrification. The impact of specific policies is debated. However, there is little doubt that the rise of an "agricultural establishment" in these years had a huge impact on the direction taken by agriculture. Funding for agricultural colleges (the US Land-Grant system was set up by the Morrill Act of 1862), extension services (established by the Smith-Lever Act, 1914), and

experiment stations (established by the Hatch Act, 1887) stayed steady or even increased (Pennsylvania State College's agriculture faculty increased by 25% even during the Depression years). In tandem with the increasing influence of "agribusiness," these forces promoted capitalistic, mechanized, scientific farming. The agricultural economy revived with the Second World War, but by that time federal policy had shifted from a focus upon keeping farm people on the land, to actively encouraging urbanization and a smaller number of highly capitalistic farms. So though farm prosperity rose (at least temporarily), agrarian communities continued to empty out. The auto, school consolidation (occurring only in the 1950s), and changing patterns of retailing resulted in the decline of small villages and favored larger centers that served a bigger rural hinterland. In the Northern Tier, this process had already begun in the pre World War II period. Penn State rural sociologists and agricultural economists conducted a survey of rural communities between the 1920s and 1950s that show businesses in Bradford County communities declining, rural population declining, and village population stagnating.[36] These were national trends.[37]

One new demographic trend was occupancy of farms by immigrants from Eastern Europe. The Wayne County soil survey (1938) mentioned increasing numbers of Poles farming in the western part of the county – as many as twenty percent in some areas. It is not clear how their occupancy was reflected in the landscape. However, this occurred only in a few spots; overall the Northern Tier was consistently characterized in the 1930s and 1940s as socially homogeneous.

Products, 1900-1960

By about 1900, a major transition was well underway. Home dairying, especially butter making was giving way to the sale of fluid milk to urban and industrial markets, and to centralized off-farm dairy processing -- butter mainly, but also such products as evaporated milk, condensed milk, and ice cream.[38] In the state as a whole, 60 percent of milk produced on farms in 1890 was used to make butter on the farm; by 1924, farm-made butter accounted for just under 30 percent of milk produced. The Northern Tier counties of Bradford, Susquehanna, Tioga, and Wayne led this trend. Even as early as 1884, only a third to two-fifths of farm-produced milk was converted into butter on the farm. This shows how much more developed fluid milk production was in the Northern Tier than in the remainder of the state. By 1927, farm butter production had dropped precipitously in these counties, as low as one percent of total milk production in Bradford County. Refrigeration, faster transportation (first rail, then trucks via improved roads),

and burgeoning demand drove this shift. By 1930, at least half of Northern Tier farms were classed as dairy farms, deriving at least 40 percent of their income from dairy. This trend to reliance on one product was singular in the Commonwealth.

The rising proportion of dairy income signified, in the view of Penn State College agricultural economists in 1929, that the "Northeastern dairy area" was "the most specialized dairy region in the State."[39] The Susquehanna County dairies served by the agricultural extension agent in 1936 averaged 16 cows, and the largest had 55.[40] (The average Pennsylvania farm had five milk cows in 1924.) Purebred cows were more common, but still a small proportion of the total.[41] Isolated from alternative employment opportunities, limited by soil quality and climate, suited to pasture and hay, and positioned within major milksheds,[42] the Northern Tier's geography supported dairying as one of the few ways to make money from the land. This only intensified between 1930 and 1950; by 1940, the percentage of income from dairy products had climbed to around two-thirds. With increased emphasis upon quantity of milk rather than quality of product, farm families began to pay more attention to yields, first by improved feed and shelter, and later by breeding.[43] This latter was a long, drawn-out process, and even by the 1940s herds were very mixed; for example, in Susquehanna County in 1936, only twenty percent of the dairy herd was purebred. Eventually the Holstein came to dominate, but not until after World War II.

Northern Tier farms typically gave between a third and half of their acreage to pasture and in some Northern Tier counties, hay took up fully three-quarters of the cropland. Again, this proportion was significantly greater than in other parts of the state. Before 1930, hay both fed cows on the farm and was sold off the farm to mines (for horses and mules) and cities. After 1930, when urban and industrial markets evaporated because of the switch to machines and autos, hay went exclusively to feed farm animals. Despite this, locally produced feed "…is supplemented by an enormous amount of purchased concentrates," said the agricultural economists in 1929.[44] Corn for silage accounted for an increasing amount of cropland during this period. Sale of dairy cattle was another source of income.[45] Poultry raising rose to the second most important income generator in the Northern Tier farm economy of this period, especially for commercial egg production.[46] The county extension agent reported in 1939 that poultry accounted for 20% of Bradford County farm income. Specialized poultry farms were the second most predominant type in two sections: southwest and south central Bradford County, and eastern Wayne County.

A few ancillary enterprises continued, but overall, diversification decreased. Oats were raised to feed horses, at least before about 1940. Buckwheat continued to be important especially in Bradford County (where it took up 10 percent of the crop area, nearly as much as oats). Indeed, "buckwheat fields and an abundance of flowering weeds have made honey production a profitable sideline on many farms, Bradford leading all counties in the number of bee hives."[47] Potatoes were raised for home consumption and for market. A significant amount of foodstuffs for farm consumption was still produced.[48] In Sullivan County, beef production prevailed before the county entered the milkshed in the mid 1920s.

General farming did not disappear. It remained quite common. In addition, quite a number of farms were characterized as "abnormal." These were usually part-time farms, often where income was supplemented by off-farm employment. In southern Tioga County this would probably mean mines in the Blossburg vicinity, but it is not clear what made farms in northeastern Susquehanna County part-time, unless perhaps it was lumbering. This pattern continued the multi-occupational tendencies of the earlier period, only now it seems off-farm wage employment rather than on-farm workshops were the site of this part-time labor.

Reflecting the area's strong dairy and poultry production and perhaps the influence of New York State's political culture, cooperative marketing associations were very influential in the Northern Tier. The Dairymen's League, formed around 1915, controlled most of the milk produced for New York City. According to the extension agents, virtually all the dairy farms in the Northern Tier marketed their milk through the Dairymen's League or other cooperatives. In 1921, the Bradford County agent estimated that two thousand local dairy farmers belonged to the Dairymen's League; in Potter County in 1916, the extension agent reported that the year had opened with a bang when 90% of the dairymen withheld milk for a month "when the Condensory refused to pay league prices for milk." In Susquehanna County in the early 1920s, the league, noted the extension agent, "sets the price of all the milk produced in the county and markets 90% of it. It owns three plants in the county." BradCo, an egg marketing cooperative, bought eggs at a premium price, and while they did not market all the eggs produced in the Northern Tier, their impact was significant. Though these organizations could end up being just as corporate as private capitalist organizations, they played an important role in sustaining prices and offering a counterbalance to rampant free market forces.[49]

Labor and Land Tenure, 1900-1960

Farm tenancy continued to be low in this region. The shift from farm-made dairy products to fluid-milk sales had important repercussions. A sea change occurred in women's work. Women continued in income-producing labor; their expansion of the farm poultry enterprise, in particular, carried many a farm through the Depression. They also continued in the altered rhythm of dairy work – milking, operating and cleaning equipment, participating in the intensified routine of feeding, and engaging in new forms of cooperative labor such as neighborhood silo fillings and hay pressing.[50] When the automobile arrived, farmwomen found themselves driving to market and on errands. It seems possible that women may have worked at honey production, too, though more research is needed to confirm this. Of course, women's work in childcare, cooking, sewing, and canning also continued. This type of work, in which labor was substituted for cash outlay, assumed particular importance during the Depression. Women also continued to do the work that cemented community ties, such as labor exchanges, Grange work (such as organizing programs and study groups), and church work.

Northern Tier farming households were affected not only by the trend to specialized dairying, but by new ways of conducting the business. In the fluid-milk business, quantity of milk mattered more than ever, because farm families could not add extra value through skilled processing, as they did with home butter making. To increase milk quantities, of course, farm people turned their attention to getting ever more milk from their cows. This was accomplished through varied strategies: extending the milking season, improving feed and shelter, and (last, and not important until after the second world war) using more purebred animals. Gradually dairy work became a year-round rather than seasonal business, so labor too intensified. It was in this period that dairy farming became firmly associated with an incessant round of work that tied families close to home. Haying and other crop harvesting was mechanized (mowers, tedders, fork lifts, hay tracks, and silo fillers); tractor power (stationary and mobile) appeared after about 1920. However, tractor power had by no means supplanted horsepower immediately. There were almost two horses per farm according to the 1940 census. Though their numbers diminished significantly by 1950, horses remained a presence on Northern Tier farms. Milking slowly mechanized, but this process was not completed by the end of the Second World War. Electrification, put in place comparatively early (for rural Pennsylvania,), assisted in running lights, coolers, milking machines, and the like. The rise of the silo (see below) brought with it new labor, including planting and harvesting hay or corn silage, and filling the silo, which was a neighborhood activity that helped to continue patterns of shared work.

Buildings and Landscapes, 1900-1960

Houses, 1900-1960

Fieldwork to date suggests that new house building was unusual in this hard-up period. Geographer Glenn Trewartha (1948) made a survey of farmsteads in which he found that farmhouses in the New York/Boston milk shed overwhelmingly had two stories and many rooms (most had 5-8 rooms and many had more than 8). All had basements. [51] Trewartha did not attempt to date the buildings he surveyed. Probably the ones that were built would be in tune with prevalent forms and styles popular nationally at the time – such as the "foursquare," Colonial Revival, etc. While to some extent, their functioning in farm production declined with the disappearance of home butter making, houses were still the site of productive activities such as home canning and feeding farm hands. The use of the house for productive purposes may have extended to the egg business in these years; the extension agent reported that he inspected a number of home egg cellars (usually, what this meant is that people had cool basements where they stored, cleaned, and graded their eggs) and helped producers improve conditions in them in 1940.

Barns, 1900-1960

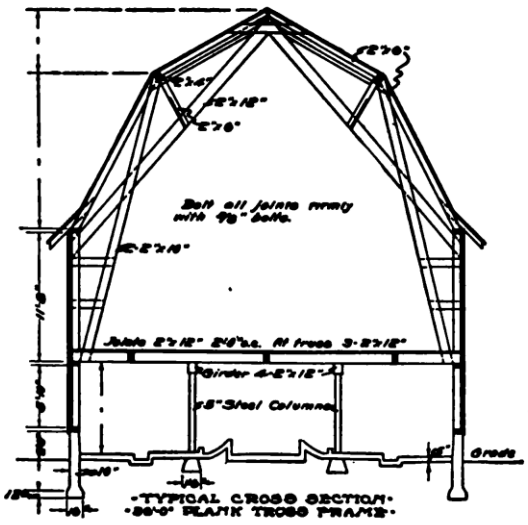


FIG. 69.—Typical Shawver barn frame.

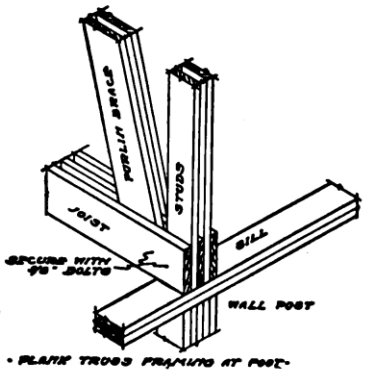


FIG. 70.—Details of construction at foot of truss, Shawver frame.

Shawver truss and frame. From William Foster and Deane Carter, Farm Buildings (New York: Wiley, 1922), 81.

Before World War II, survey work suggests that the "Basement barn" remained predominant. The biggest changes were likely in barn layout, as labor efficiency in dairying became more important and as farming specialized more. Layout changes would include adding stanchions, subtracting horse stables, widening barns from the customary 30 to 36 feet, raising the roof to give more hay storage, and reorienting the floor plan from crosswise to lengthwise. In keeping with the emphasis on larger dairy herds, another strategy for altering barns was to add a one-story cowshed (see photos below). I. F. Hall, writing in 1929, surveyed over 700 New York state farms and found that over 500 of these had cows face out, so manure could be efficiently gathered; cows could reach their stanchions more easily; hay could be thrown down in front of cows, and so on. Gambrel roofs and "rainbow" or "gothic" style roofs were popular, framed to accommodate hay tracks and forks, since the average farm produced a lot of hay and storage became more critical as pressures for quantity milk production increased. Framing systems were probably simplified. I. F. Hall noted that new barns built since 1920 were plank framed.[52]

Basement barn with one-story cow shed, Sullivan Township, Tioga County. Barn, c. 1900; cow shed, c. 1940. Site 117-SU-002.

Barn, milk house, cow shed, and silos, Sheshesquin Township, Bradford County. The barn is from the early 20th century while the other structures date to c. 1930-60. 015-SH-002.

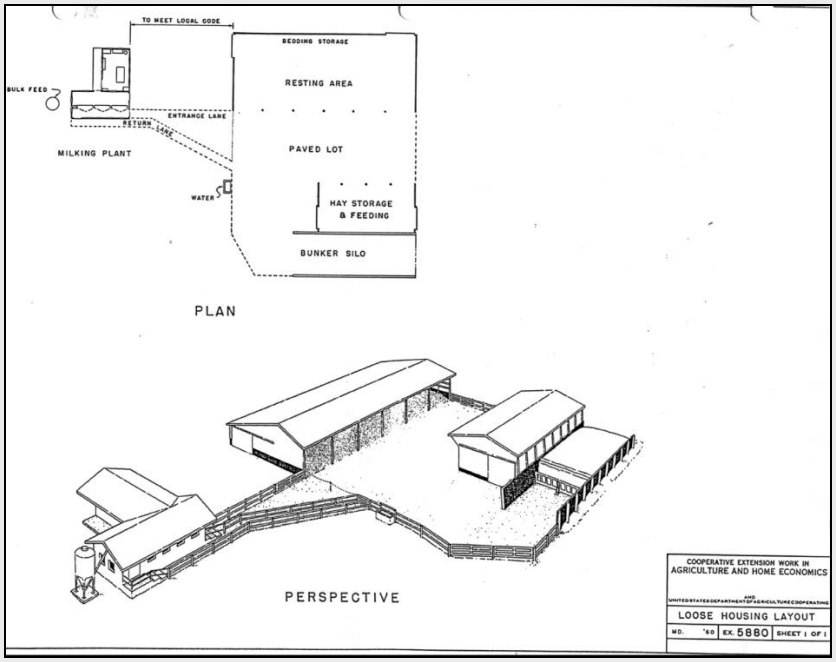
Barn, milk house, and silos, Sullivan Township, Tioga County. The gambrel roof basement barn with ell probably dates to the early 20th century; the milk house to around 1925, with bulk tank added cl. 1960. The wood stave silo dates to the early 20th century and the concrete stave silos to the mid 20th century. Site 117-SU-004

117-SU-006-01. Barn from road. Tioga County. A basement barn (right) with hay barn extension.

Barns of this era almost universally were altered to include concrete flooring and increased sunlight. Whitewashing appeared; metal stanchions replaced wooden ones; ventilation was added; windows were added and/or enlarged.[53] Alterations relating to light and cleanliness can be directly traced to the impact of municipal (later state) sanitary regulations. In the years when requirements for Grade "A" or "B" milk in New York City were introduced or tightened, the extension agents reported a flurry of building and advising activity. In 1928, for example, the Tioga County extension agent reported that "Dairymen have been getting ready for board of health inspection and have needed changes in barns and plans for milk houses. Assistance in this work has been general in the county." These regulations were aimed at securing a clean and disease-free milk

supply for the city. Since the Dairymen's League signed contracts on behalf of thousands of individual farmers, the impact of these regulations was arguably faster and more uniform in this part of the state than (for example) in central Pennsylvania, where agent reports show that farmers altered their barns in a piecemeal way extending well into the 1950s. In keeping with the discipline exerted by the New York City market, Northern Tier counties led the way in testing and certification programs for bovine tuberculosis and Bang's Disease. The architectural alterations also were made to conform with these anti-disease programs.

Another new barn-related structure that came into use after the Second World War was the milking parlor. Under the older system, human milkers moved from cow to cow, and carried milk from barn to milk house. With milking parlors, the cow moved to the milking machine, and the human attendant did not have to stoop, nor to move from one cow to another, nor even collect milk, since it was pumped directly to cans. Milking parlors were low, relatively small, usually concrete block structures appended to a barn, sometimes integrated in a newer barn.



Milking parlor in relation to free stall barn. USDA, 1960.

A few stable barns were found in field survey work. This type generally has a full first story rising up from ground level; its walls are pierced with many windows. Internally, this barn has a central aisle running the entire length of the ground level, with gable end doors on one or both ends. An upper level provides ample feed and hay storage room,

often by means of an arched roof. This is preeminently a dairy barn. Early versions sometimes also accommodated horses, but in the post-horsepower era, this type of barn housed increasingly large herds of dairy cattle. It reflects specialization, large scale, and a break from traditional forms and materials. Concrete block, poured concrete, and metal stanchion and window fittings represented industrialized, modern materials. These stable barns accommodated not only larger herds, but larger Holstein cows and the huge amounts of feed they required. The stable barn also represents a response to stepped-up state regulation of the dairy industry, which mandated (among other things) ample light and ventilation for dairy cows.

This type of barn probably had nineteenth-century roots, but became popularized through the agricultural experiment station/extension system establishment. In particular, the Wisconsin agricultural colleges published designs and plans that seem to have been widely circulated. Agribusinesses also marketed designs and materials for barns. For example, the Weyerhaeuser Corporation distributed catalogs with plans for barns and equipment, and sold materials and plans. The 1954 barn illustrated below in Morris Township, Tioga County has some of the features of barns illustrated in the Weyerhauser catalog. These mid twentieth century barns represent the widening influence of an ideology that stressed capitalistic, scientific, systematic farming.

Stable barn, Rutland Township, Tioga County, mid 20th century. Site 117-RU-002.

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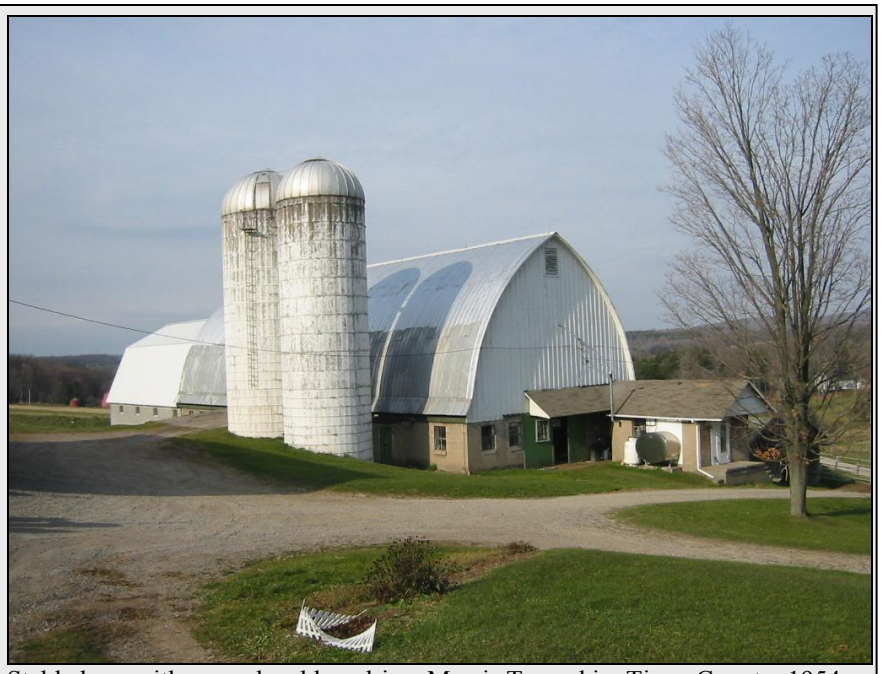


Stable barn with upper level hay drive, Morris Township, Tioga County, 1954. The two concrete stave silos and the milk house are also from the mid 20th century. A bulk tank c. 1960 protrudes from the earlier milk house. Site 117-MO-002.

Mow drive at site 117-MO-002.

In the post World War II period, the pen barn (also called a free stall barn) became more highly recommended by agricultural engineers. Some farmers used the pen system to replace the stall-and-stanchion type of arrangement. The advantages of the pen system involved saving on labor and construction costs. When not being milked, cows roamed freely in a large open space with dirt floor and ready access to hay or silage. At milking time, the cows were trained to walk into a milking parlor, where they ate feed

concentrates while being milked, then proceeded straight ahead back into the pen or pasture. This saved on labor costs in feeding (the animals fed themselves in the pen, and were fed concentrates simultaneously with milking) and stable cleaning, and it saved construction costs because the pen barn lacked expensive stanchions and full concrete floors, and was less well insulated. The pen barn system incorporated milking parlor, and often the milk house then adjoined the parlor.[54] Very often, the pen barn was made of pole construction, also increasingly popular in the postwar period.[55] Fieldwork did not locate these types of barns in the Northern Tier – at least not any that could be definitely dated to the period before 1960.

Silos, 1900-1960

The most significant new structure to appear on the agricultural landscape in this period was the silo. A silo is an airtight structure that holds fresh organic matter (moisture content 50-65 percent) destined for winter animal feed. It is filled with shredded or chopped grass, corn, or sometimes other plant material, which ferments into a highly nutritious feed. Silage feed resulted in significant productivity increases for dairy cows, and also permitted marginal farms to carry more animals. Ensilage was first publicized in the US in the late 19th century when the results of experiments in Europe became known. However, it did not become widespread until dairying was taken up more seriously. Bradford quickly became the leader in the state in numbers of silos. By 1930, the percentage was up to 56 in Susquehanna County.[56]

Wood Stave silo, Tioga County, c. 1890-1925. Photo-only site, no site number.

Silos can be constructed horizontally in pits, or vertically. Most silos of the first half of the twentieth century were vertical. Early silos were sometimes placed inside the barn, rectangular in shape, and of wood construction. These were quickly supplanted by round vertical silos located outside the barn, usually in a spot that would permit efficient filling (usually from holes in the top) and unloading (either from a tier of successive doors from which silage was thrown down an exterior chute, which contained a ladder for access to the doors, or from the bottom). Early silos were unloaded by hand, from the top. The land-grant establishment published many "how-to" brochures aimed at helping farmers build their own silos of wood or concrete. Because masonry is more durable and cleaner, it became the norm. Commercial organizations marketed many types of silos too. Some sold special curved brick; others made tiles; still others advertised systems depending on interlocking rings of poured concrete. Cement staves became popular after about 1910. Galvanized iron was mentioned by Hall in 1929.[57] A 1918 Pennsylvania State College circular (# 72) mentioned wood stave, hollow tile block, poured concrete rings, concrete staves, concrete blocks, metal, and bricks as silo construction materials.[58] Allen Noble, in argues for a sequence in roof types, from gable to cone to hip to dome to hemisphere. [59]

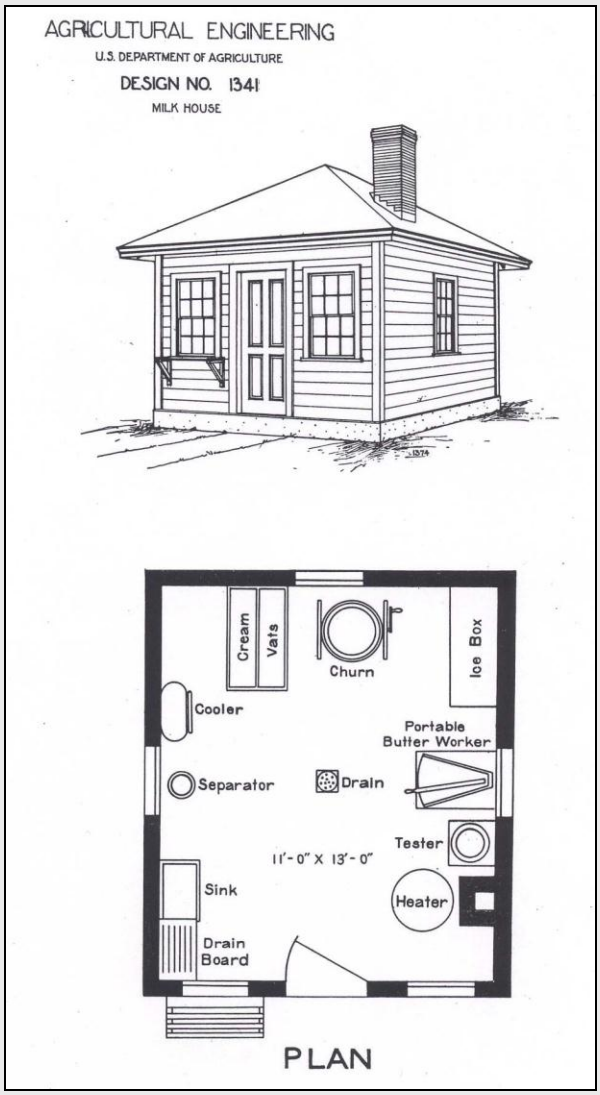
Wood and metal stave silo, Eulalia Township, Potter County, c. 1925. According to patent numbers stamped onto the silo, patents pertaining to this silo were issued in 1903 and revised in 1914 and 1915.

Milk Houses, 1900-1960

The milk house was another major new form on the early twentieth-century dairy farm. It wasn't a big building, but is an important reminder of the new role of the state and the agricultural establishment in agriculture. The state (meaning the government at any level) influenced the construction of milk houses in the first place, because during the Progressive and New Deal eras, legislatures and municipalities passed sanitary codes that required inspection not only of milk, but of dairy herds and milk production facilities.[60] New York City pioneered in these efforts, and also seems to have been more effective at enforcement than other areas. In Pennsylvania, according to Stevenson Fletcher, a very few municipalities had inspection laws starting in the late 19th and early 20th centuries; however, enforcement was patchy. The first statewide dairy inspection law was passed in 1929, with a revision in 1933. This law provided for inspection of farm sanitary conditions, including facilities for sterilizing dairy equipment and milk houses for isolating milk.[61] These regulations were a facet of the assault that was launched on bovine tuberculosis and other diseases in this period, aiming at ensuring a fresh, uncontaminated milk supply. In order to market milk, increasingly farm producers had to comply with regulations that required them to install easily cleaned surfaces (like concrete) in barns, remove milk storage areas from dirt and odors (by building milk houses), cool milk, sterilize equipment, and the like. In Pennsylvania, these regulations took effect relatively early in the Northern Tier, because New York City, where most milk went from there, passed quite stringent inspection standards by the 1920s. The milk house was one product of these new laws. In turn, its form and construction were influenced significantly by the agricultural establishment (meaning the complex that included state departments of agriculture, the land-grant university and extension apparatus, and agribusinesses). This new element in the farm landscape, therefore, illustrates the growing influence of the "agricultural establishment" on everyday farming practices and landscapes. Agricultural extension agents regularly disseminated plans for milk houses. Likely, for every farmer who followed a plan exactly there were more who either copied his building, or who adapted the basic guidelines using available materials and expertise. Commercial enterprises also aggressively marketed materials (like Portland Concrete) and designs (Sears, Roebuck marketed ready-cut milk houses). The overall result was a new level of homogeneity and standardization.

Milk houses provided a place to store and cool fluid milk before it was transported to market; to store milk cans not in use; and to wash containers (and sometimes other equipment like separators). Plans offered by the USDA for farm milk houses typically gave dimensions ranging about 10 by 13 feet up to around 12 by 20 feet. Interior plans

for a 10 by 13 milk house with ell (# 909, "capacity 20 to 30 head market milk") show a two-room plan with door leading to a wash room; milk room to one side, which contained a cooling tank and led to raised loading/unloading platforms and sunning racks, mounted on the outside. The ell contained a boiler room[62] with its fuel supply, and back door. Larger milk houses had the same basic three spaces, only larger, and sometimes equipped with testers and separators. One (#1337) had a churn, butter worker, ripening vat, and refrigerator, and another (#1339) had quarters for workers. Another small, 12 by 14, one-room milk house (#1341, see illustration) was designed for "butter making by hand" for 20 cows. It contained the same basic spaces, but not divided. The very smallest, at 7 by 9, had a concrete foundation with a sunken vat for cooling cans of milk. All of these plans had sloping floors with drains, and provision for ventilation and light. After about 1950, milk houses were sometimes altered to accommodate bulk tanks.



Milk House #1341, USDA design taken from: USDA Office of Cooperative Extension Work and Bureau of Public Roads Cooperation, Farm Building and Equipment Plans and Information Series, 1929. Not paginated.

Actual milk houses on farms that were surveyed tend toward the smaller end of this range. Though the USDA models were frame, of the milk houses identified in the Northern Tier, a majority were made of concrete block, and the remainder were frame. The frame milk houses appear to date earlier than the concrete block ones. The most popular design was not for a detached building, but for a small shed addition, located most commonly on the gambrel roof end of a barn, sometimes along the eaves side.

Gambrel roof barn with shed roof milk house and hollow tile silos, Troy Township, Bradford County, c. 1905, 1920, and 1930 respectively. Site 015-TR-004.

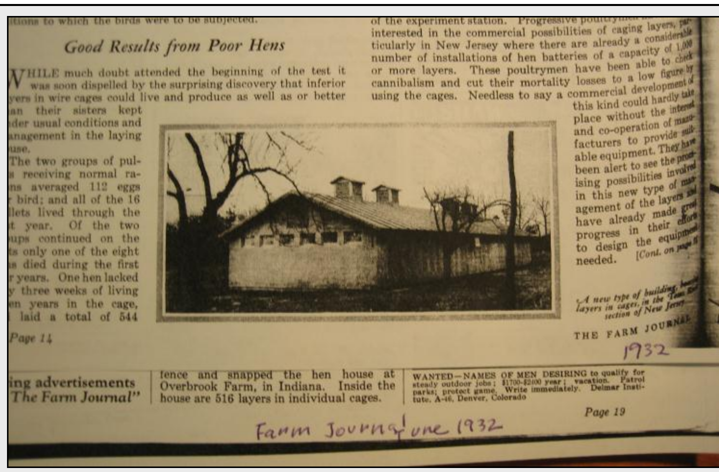
Concrete block milk house, Sullivan Township, Tioga County, c. 1930. Site 117-SU-009.

Poultry Houses, 1900-1960

General Developments in Poultry Housing

In general, poultry housing in the twentieth century responded more and more to developments initiated by the agricultural establishment, whether the extension system, agricultural research universities, or agribusinesses marketing mass-produced equipment. For example, home-scale incubators and "brooder stoves" were advertised and illustrated in the farm press in the 1920s. The incubators were heated box like affairs mounted on legs. The brooder stoves had a central heat source (sometimes an oil burner), which warmed a protective, usually conical hood under which the chicks could huddle. It is not clear where these devices would be set up, but advertisements usually featured women making testimonials, which suggests that this equipment might be set up near or possibly even within the farmhouse.[63]

By the 1930s, "battery" brooders were appearing where larger numbers (over 500) of chicks were raised. These consisted of stacked cages with "wire-mesh floors with dropping-pans underneath and water- and feed-hoppers on the outside."[64] Proponents claimed many advantages over the traditional brooder house, especially lower cost of building, the ability to keep many more birds in a smaller space, and lower labor costs.[65] Notably, one author pointed out that "battery brooding will produce good birds without much experience on the part of the operator…"[66] The shift to less-skilled labor probably occurred as men took over poultry raising, and also as sheer numbers rose. The buildings in which batteries were housed often were indistinguishable from other types of poultry houses; but some purpose-built battery houses were built which were characterized by high windows around the perimeter walls. These permitted batteries to be ranged along the walls, and light to enter from above. No field examples of this type were encountered in this study.



itions to which the birds were to be subjected.

Good Results from Poor Hens

WHILE much doubt attended the beginning of the test it was soon dispelled by the surprising discovery that inferior yers in wire cages could live and produce as well as or better an their sisters kept der usual conditions and anagement in the laying use.

The two groups of puls receiving normal rans averaged 112 eggs bird; and all of the 16 llets lived through the t year. Of the two ups continued on the ts only one of the eight s died during the first r years. One hen lacked y three weeks of living en years in the cage, laid a total of 544

Page 14

of the experiment station. Progressive poultrymen … interested in the commercial possibilities of caging layers, particularly in New Jersey where there are already a considerable number of installations of hen batteries of a capacity of 1,000 or more layers. These poultrymen have been able to check cannibalism and cut their mortality losses to a low figure by using the cages. Needless to say a commercial development of this kind could hardly take place without the interest and co-operation of manufacturers to provide suitable equipment. They have been alert to see the promising possibilities involved in this new type of management of the layers and have already made great progress in their efforts to design the equipment needed. [Cont. on page …

A new type of building, housing layers in cages, in the … section of New Jersey

THE FARM JOURNAL

1932

ing advertisements "The Farm Journal"

fence and snapped the hen house at Overbrook Farm, in Indiana. Inside the house are 516 layers in individual cages.

WANTED—NAMES OF MEN DESIRING to qualify for steady outdoor jobs; $1700-$2400 year; vacation. Patrol parks; protect game. Write immediately. Delmar Institute, A-46, Denver, Colorado

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Farm Journal June 1932

Battery House, illustrated in Farm Journal, June 1932, p. 14

Battery House interior, Farm Journal, June 1932, p. 14

The "battery" philosophy soon extended beyond chicks to adult birds. Articles began to appear advocating batteries not only for brooders and layers, but also for broilers. By the 1930s, the free range philosophy was in decline among the agricultural establishment (i.e. in the farm press, among extension agents, and with agribusiness), though on many a farm range practices continued. *Farm Journal* poultry editor D. C. Kennard wrote in 1932 that "Today the pendulum is swinging toward confinement." Agricultural experiment station testing in Ohio and other states established that confined birds actually did better than those who were raised partly or wholly on free range. An important nutritional discovery -- that cod-liver oil added to the birds' diet helped chicks thrive indoors -- spurred a "revolution in hen-coops." With yards no longer emphasized and numbers of birds rising, multi story laying houses began to appear, and the new philosophy also encouraged renovations to large barns for poultry.[67] These barn renovations did not necessarily always contain battery cages, but they did illustrate the abandonment of free-range practices.

By the 1950s, the battery technique was modified, because cages stacked above one another had resulted in ventilation and disease problems. Among large producers, cages were retained, but in single rows suspended above a concrete floor, often in a long, low

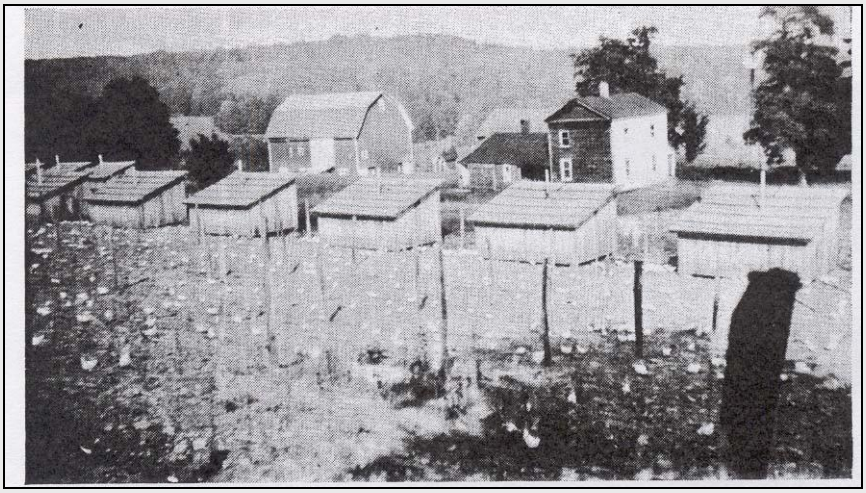
building. Waste pits reduced disease and cleanup problems. Novel construction techniques such as trussed rafters and sheet-metal construction minimized the number of posts and thus created an open, flexible space. Farm magazines also advertised manufactured poultry housing, including conventional shed- or gable roof structures, but also pointed-arch houses. Prefabricated poultry houses were also discussed in the farm press. It is not clear how many farmers in the region took advantage of these technologies.[68] Many continued on a more modest scale and their buildings were correspondingly modest.

Ralston Purina advertisement, Farm Journal, 1958. This illustration shows a "cage egg factory." Note the long, low housing.

Poultry Housing in the Northern Tier

As poultry keeping began to assume a strong second place among Northern Tier farm income producers, it attracted attention from men, most noticeably agricultural extension agents. (Men also became more involved in poultry production on the farm, though poultry labor did not shift over completely to men until after our period. The agricultural extension agent reports refer to "poultrymen," but the photographs in their collections always show women at program events featuring poultry.) The chief result on the landscape was the appearance of more poultry housing, often patterned on advice from agricultural extension agents or in farm publications, also from commercial/cooperative corporations as BradCo.[69] Therefore, as with milk houses, the stamp of the agricultural establishment appeared on the farm.

The type of housing depended on the purpose. For hatching chicks from eggs, portable brooder houses were made. These would have a stove to keep the "peepies" warm, and they would be relatively small. They were often designed to be portable – kept near the house while the chicks were very young, then moved onto pasture. None of these was positively identified in fieldwork in the Northern Tier. Pullets (female birds under one year old) were sometimes raised to laying age (around 6 months) using a free-range system and portable shelters. While there is photo evidence of significant activity of this type in the Northern Tier, fieldwork did not document any extant free-range shelters. These are ephemeral buildings, particularly since they were designed to be movable.



Chicken range on Coe H. Stearns farm, Susquehanna County, Harford, c 1925. Source, Harford Township Susquehanna County Pennsylvania 1790-1940 (Harford, PA, 1940), 365.

When hens reached laying age, laying houses provided roosting perches, open floor space, feed areas, and nesting boxes (individual wall nests, community nests, or nest rooms). The buildings were usually well lighted and ventilated. Depending on the scale of poultry raising, they could be one story, or more. If barns were converted for poultry, it was not unusual to find five or six tiers. It seems that most poultry facilities in this period were for egg production. The agricultural extension publications before 1950 do not seem to differentiate extensively between houses for layers and broilers; the only difference that's mentioned (in Extension Circular # 358, 1950) is that a house of a given size can always accommodate more broilers/fryers than egg layers, presumably because less space is given over to nesting boxes and the like. Overall, the poultry houses of this

period have these frequently seen common features: shed form; banks of windows; frame construction.[70]

This type of poultry house remains on the landscape. The fieldwork suggests that in the study area, the predominant types of poultry housing were one-story shed-roofed frame structures with banks of windows on one eaves side, and also renovated multi-story barns. Few if any long "cage egg factory" poultry buildings dating from before 1960 were surveyed in fieldwork.

Poultry house, Westfield township, Tioga County, c. 1930. Site 117-WE-002.

Poultry house, Sullivan Township, Tioga County, earlier building c. 1900 renovated for poultry c. 1925. Site 117-SU-001.

Privy, 1900-1960

This outbuilding persisted into the twentieth century, as many a Northern Tier farm lacked plumbing.

Privy, Morris Township, Tioga County, c. 1940. Site 117-MO-001.

Garage, 1900-1960

Of all the new types of machinery that became available in the twentieth century, the automobile was the most popular. Even in 1927 Northern Tier farms had more cars than silos, or radios, or tractors. So, the garage became a feature of the farmstead. Again, this was a new building type, generated not from a regional economy or culture but by a national trend; and garages were not only built with materials of the new industrial age (concrete block, rock face concrete) but often took on a generic look. However, sometimes garages were created by recycling older buildings, too.

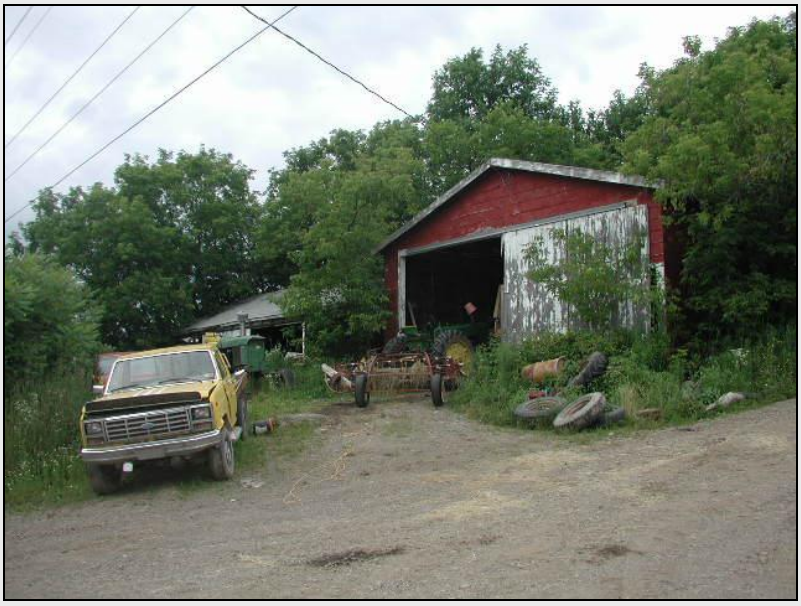
Garage, Sullivan Township, Tioga County, c. 1935. Site 117-SU-005.

Machine Shed, 1900-1960

Machine sheds were needed to house the corn binders, mechanical milkers and potato diggers that were used on the Northern Tier farm.[71] However, if Pennsylvania State College surveyors are to be believed,[72] only 71% of Bradford County farmers housed all their machinery – much lower than in the other counties surveyed. 43% owned a machinery shed (as opposed to 81 percent in Centre County) and only 25% owned repair shops. Indeed, even as late as 1950, there were fewer milking machines, farm tractors, and tractors than farms in the Northern Tier counties; and quite small numbers of modern hay balers and corn pickers. Nevertheless, machine sheds do remain.

As new manufacturing processes and materials developed, they affected farm buildings. Manufacturers like the Stran-Steel Corporation advertised farm buildings with all steel components, or hybrids that combined wood and steel.[73] The Quonset building, made famous during the war, was now marketed for agricultural uses. An April 1957 advertisement in Farm Journal featured a happy farmer enthusiastically endorsing his Quonset® dairy barn. This building type did not achieve much popularity for animal housing, but fieldwork did document at least one storage building in the survey area.

Quonset hut, Burlington Township, Bradford County, date unknown. Site 015-BU-001.



Machine shed, Sullivan Township, Tioga County, c. 1945-60. Site 117-SU-006.

Corncrib, 1900-1960

The corncrib continued to be a minor outbuilding on the Northern Tier farm. Wooden corncribs are difficult to date due to their generic appearance. Cylindrical metal corncribs date from the mid-twentieth century onward.

Cylindrical metal corn cribs, Sullivan Township, Tioga County, date unknown. Site 117-SU-005.

Hay Drying Shed, 1900-1960

A few surveyed properties had hay drying sheds. These gable-end rectangular structures contain large doors for each bay, along both eaves sides. These bays accommodated hay wagons and drying equipment.[74] These buildings may post-date 1960, but the type existed before then.

Hay drying shed, Sullivan Township, Tioga County, date unknown. Site 117-SU-004.

Landscape Features, 1900-1960

Farm Layout

Geographer Glenn Trewartha's study, 1948, found that a third of farms in the New York-Boston fluid milk area were divided by a highway -- more than in any of the regions he examined. Conversely, it was atypical for the farmstead to be set back from the highway, and the most common setup was for the farmstead to front on the highway. Field observation in 2004 confirmed this as a very common arrangement.

Divided farmstead, Burlington Township, Bradford County. Site 015-BU-001.

Orchard

Most farms had orchards, especially apple orchards. They commonly were sited near the house. The photo below shows apple trees in the yard.

Orchard remnant, Stevens Township, Bradford County. Site 015-ST-001.

Contour Plowing and Strip Cropping

Contour plowing arranges furrows along contours of slopes, thus reducing runoff. The Farm Journal in August 1935[75] defined strip cropping as "a form of contour farming in which strips of densely-growing, erosion-resistant crops, such as alfalfa, lespedeza, sweet clover, Sudan grass, timothy, and the small grains, are alternated across the slope with strips of cultivated row crops. The strips of erosion-resistant crops check the speed of the runoff, filter out the soil being carried by the water, and cause the land to absorb moisture." The article also noted that strips demanded less labor than square fields and "permit more efficient use of machinery." They also fit well with terraces.

This resulted in longer narrower fields, and destruction of some fencelines. The extension reports for the Northern Tier do not mention this often; in fact, the Susquehanna County agent argued that grassland kept erosion down and so contour plowing was not as important in the Northern Tier as elsewhere. There is some corroborating evidence for this observation in aerial photographs. In the 1938 aerial shown below, few fields are strip cropped, and many treelines remain.

Penn Pilot 1938 aerial accessed 6/21/06, Asylum Township, Bradford County.

Farm Ponds

There is ample documentation for ponds in the Northern Tier in the post World War II period. In 1948 the agricultural extension agent reported that hundreds of ponds have been built "in some communities six or more farm ponds can be seen within sighting distance from one point."[76]


Pond, Deerfield Township, Tioga County, date unknown. Site 117-DE-005.

Roadside Treelines

In the Northern Tier, the ornamental front-yard treeline is presently a popular landscape element.

Wire Fencing

In general, woven wire replaced barbed wire in the twentieth century. As cattle more commonly were confined closer to the barn, it is possible that fencing became less important.

Ornamental Plantings

These would include trees, shrubs, flowering plants, etc. Below see a good example of a farmhouse "guarded" by "sentinel trees."

Farm landscaping showing sentinel trees, Deerfield Township, Tioga County. Site 117-DE-003.

Stone Fences

Stone fences remained here and there, though in recent times they have been "mined" and little is left.

Treeline with stone fence enclosing pasture, Morris Township, Tioga County. Site 117-MO-001.

Pasture

Pasture was still common in the Northern Tier. See photo above.

Farm Lanes

Farm lanes linked one farm to another. Traces of them can be found.

Woodlot

The farm woodlot remained an important source of fuel and sometimes also of income through lumbering.

View near Canton, 1936, Farm Security Administration photo. Photo by Paul Carter. Digital ID fsa8c51736, Library of Congress.

Potter County, 1920s, Honeoye area of Sharon Township, Potter County, showing the Elliott farm and their neighbors, the Genany's farm, Drake farm, and Phoenix farm.
http://www.eg.bucknell.edu/~hyde/potter/Honeoye.JPG, accessed 7/11/06.

1959 aerial, Herrick Township, Bradford County. Woodlots, treelines, and patchwork crop fields are clearly visible. Penn Pilot aqp_2w_100, accessed March 7, 2012

Property Types and Registration Requirements – Criterion A, Agriculture

Property Types: These property types apply to properties in all regions.

Farmstead

A farmstead is defined here as encompassing the farm dwelling[s]; barn; outbuildings; and the immediately surrounding land on which these buildings are situated. It normally excludes cropland, meadow, pasture, orchard, and woodland, but would include such landscape features as yards, windbreaks, ponds, gardens, ornamental trees, decorative fences, driveways, etc.

Farm

A farmstead plus crop fields, meadows, pastures, orchards, woodlots, etc., including landscape features such as fences, tree lines, contour strips, streams, etc. and circulation networks.

Historic Agricultural District

A group of farms which share common architectural and agricultural landscape features; are linked together by historic transportation corridors, including roads, railroads, paths, and/ or canals; and together express characteristic features of local historical agricultural patterns.

A. Criterion A, Agriculture

This section first outlines general consideration for Pennsylvania as a whole, with reference to considerations related to labor, gender, and tenure. These are followed by Criterion A requirements for each region and subregion.

General Considerations for Pennsylvania as a Whole

National Register eligibility with respect to agriculture in each Historic Agricultural Region of Pennsylvania will depend upon how well a given property reflects the historical farming system in that region. It is very important to remember that Criterion A significance should be assessed in relation to how a given property typifies a farming system, not in relation to whether a property is exceptional or unusual. A property should exemplify a farming system in all its aspects. The totality of a property's representation in the areas of production, labor patterns, land tenure, mechanization, and cultural traditions will determine its National Register eligibility.

Historic Patterns of Agricultural Production

A key characteristic of Pennsylvania agricultural production from settlement to about 1960 is diversification on small, family farms. Therefore, a farmstead, farm, or historic agricultural district must reflect diversified agriculture through a variety in historic buildings and landscape features. It is critical to note that diversified agricultural production involves two facets:

1) a mix of products. This mix varied with time, place, and culture. For each region, the narrative explains the prevalent mix.

-AND-

2) a variety in use for those products, ranging from direct household consumption, to animal consumption, barter exchange, and cash sale to local or distant markets. In general, as far as use is concerned, over time a larger proportion of products went to cash markets, and money figured more and more prominently as farm income. However, production for family consumption, animal consumption, and barter exchange continued to occupy a significant position well into the twentieth century, with a notable surge during the Depression years. Historic resources should reflect the variety of household and market strategies employed by farming families.

Social Organization of Agricultural Practice

Historic production patterns are necessary but not sufficient to determine eligibility. Social organization of agricultural practice had a profound influence on the landscape that must be recognized. Labor, land tenure, mechanization, and cultural practice should be considered. For example, in the Central Limestone Valleys, share tenancy was an important and enduring practice that significantly influenced the architecture and landscape of farmsteads, farms, and farm districts. In the Northern Tier, conversely, high rates of owner-occupation lent a different appearance to the landscape. The level of mechanization was related to labor practices, and also shaped the landscape through field patterns and architectural accommodation (or lack thereof) for machinery storage. Insofar as cultural factors influenced agricultural production or practice, they should be taken into account in determining the eligibility of farmsteads, farms, and farm districts. For example, Pennsylvania German food ways may have influenced agricultural production patterns and hence architectural forms; Yankee/Yorker families brought with them the English barn (which, because of its organization, shaped farming practice) and the penchant for classical revival styling.[77]

Issues of Chronology

To be determined significant with respect to Criterion A for agriculture, a farmstead should either:

1) possess a strong representation of typical buildings and landscape features from one chronological phase of the region's agricultural history,

-OR-

2) possess a strong representation of typical buildings and landscape features that shows important agricultural changes over time.

How to Measure a Property in its Regional Context

Whether it depicts one chronological period or change over time, a farmstead, farm, or historic agricultural district will normally be significant under Criterion A only if:

1) its individual production, for the period in question, reflects the average or above average levels for its township in the same period. (This can be determined by comparing the farm's manuscript agriculture figures to township figures.)

2) its built environment reflects that product mix. (The Narrative explains how different agricultural building types relate to agricultural production.)

3) its built environment reflects locally prevalent social organization of agriculture including a) levels of mechanization, b) labor organization (including gender patterns) and c) tenancy.

3a) levels of mechanization: in highly mechanized areas (relative to the state levels) we would normally expect an array of machine sheds, machinery bays integrally placed in barns, horse-power extensions, etc.[78] Conversely, in low-mechanization areas such as the Northern Tier, these facilities will likely be less visible.

3 b) labor organization: Patterns of collective neighborhood labor may be present; for example, a butcher house might be located near the road. For early phases of agricultural development, we would not expect to find overt architectural accommodation for hired laborers. But in the wage-labor era, those expressions would range from accommodations on the farm (rooms over springhouses, wings of houses) to purpose-built migrant housing. Mechanization could affect labor organization because it eliminates workers. Architectural and landscape elements that illustrate patterns of labor organization should be assessed for significance (with respect to agriculture) based on the level of clarity, intensity, and

chronological consistency with which they show labor patterns. For example, if a c. 1850 farm house has a c.1880 workers' wing with back stair and no access to the family living area, that is both a clear and chronologically consistent illustration of shifts in hired labor's status.

Establishing significance for the gender organization of labor is more complex. We could think in terms of a continuum: from work almost always done by men—to work almost always equally shared by men and women – to work almost always done by women. In general, the farmstead and even the farm should be regarded as a mixed-gender workspace, because so much farm work was shared. However, there are a few cases where work was not only clearly associated with either men or women, but also had spatial and architectural manifestations to match. So we should focus on these cases when assessing significance with respect to gender patterns of agricultural labor. In the regions under discussion here, besides work done in the house (by women), several cases fit these criteria. On Northern Tier farms (1830–1900), men generally milked, and women made butter; the former activity occurred in the barn, the latter either in a farmhouse ell or in a separate "dairy kitchen" sited between house and barn. Later, fluid milk sale (mainly organized and conducted by men) replaced home butter making. Some sort of facility for home dairying is a sine qua non; one that is sited and oriented efficiently with respect to house and work-yard would be of greater significance than one that was not. And, a farmstead that contained both an ell or kitchen and a milk house located by the barn would demonstrate the shift in gender patterns better than a farm with just one of each. Another important case is pre-1945 poultry raising, which was dominated by women. If a pre-1945 poultry house is located well within the house's orbit, it suggests that expresses more significance with respect to women's agricultural labor than a pre-1945 poultry house that sits on the edge of a field. And, if a farmstead has both a pre-1945, small poultry house located between house and barn, and a large, post-1945 poultry house sited far from the house, this illustrates changes in gender patterns better than a farmstead that has only one poultry house.

3 c) Tenancy: This aspect of social organization will be reflected most in historic agricultural districts (rather than on farmsteads or farms). A

historic agricultural district should reflect prevalent levels of tenancy for its region. So, we would expect to see fewer documented tenant properties in Northern Tier districts than in a Central Limestone valleys district. Where individual farms or farmsteads are concerned, a farm or farmstead with a documented history of tenancy are significant for tenancy, but only in regions where tenancy rates were historically higher than the state average.

Cultural Patterns

If, in instances where a farm has a strong, documented connection to a particular ethnic group, its architecture and landscape should show evidence of that connection. [See Narrative for discussion]. Significance should be evaluated by the degree of clarity with which ethnic heritage is expressed (i.e. is it highly visible in more than one way, for example in both construction details and use?); and in cases of farmsteads, the extent to which multiple buildings and landscape features express ethnically derived agricultural practice.

In every case, even where all of these substantive requirements are met, there will be degrees of quality in representation. In other words, it is not just the presence of links to the region's agricultural history (i.e. the overall property's integrity) that makes a property outstanding, but also the quality and consistency of those links. Where possible, nominations should attempt to assess what we might call "intensity" or "layering" of representation. This intensity of representation may appear in the way the farm's component parts preserve historical relationships. For example, if a farmstead retains a springhouse near the main house and a milk house sited near the barn, that is an especially intense illustration of changes in the dairy industry. The idea of "layering" connotes the multiple meanings that can be contained in the siting, layout, and content of the architectural and landscape features. The farmstead and farm features together might, for instance, offer expressions that are simultaneously cultural and local, and also show how wider trends affected agriculture. For example, a Northern Basement Barn indicates cultural heritage (in placing an "English barn" above a basement) and agricultural change (in dairying-oriented basement level). Another example of "layering" could be if the economic and cultural importance of livestock is illustrated by several buildings and landscape features – not just one or two. And, there could be a variety of farm workspaces that testify to the diversified strategies historically pursued by farming families in the region.

When assessing agricultural change, remember to consider not only changes in barn, outbuildings, and landscape, but also in the farmhouse. For example, on a farm where large-scale production was accompanied by a shift in gender patterns of labor, look for changes in the farmhouse's interior work space; typically these might include smaller, more isolated kitchen spaces and more spaces devoted to display or leisure. Or, where dairy processing became centralized, dairy dependencies attached to a house might be converted to other uses. Rural electrification and the shift away from wood for fuel could also affect interior farmhouse organization. For example, with electrification, the summer kitchen's function often moved back inside the house.

Property Types and Registration Requirements Specific to the Northern Tier Grasslands Region

A. Properties may possess a strong representation of typical buildings and landscape features from one chronological phase of the region's agricultural history.
To represent the period c. 1830 to 1860 ("A Diversified Woodland, Grassland, and Livestock Economy"):

> A **farmstead** should retain a frame or log house with characteristic features; an English barn; and one of: freestanding granary or ice house. Relict farmstead landscape features from this period are rare. A **farm** should retain the farmstead elements named above, plus significant acreage with remnant landscape features such as fields, treelines, boundaries, and woodlots. A **historic agricultural district** should include contiguous or clearly connected farmsteads that share visual, landscape, and architectural characteristics that date to and are typical of the period. Since individual properties which solely illustrate this early period are likely to be rare, districts with a concentration of such properties are also likely to be rare. It is very important to note that not only production patterns, but historic patterns of tenancy, labor, and culture should be clearly represented.

To represent the period 1860-1900 ("Diversified Home Dairying") for the Northern Tier Grassland Historic Agricultural Region:

A **farmstead** should include, at a minimum, a Classical Revival house in upright-and-wing or foursquare form and kitchen ell; a Basement Barn or Gable-Entry Banked Barn, *or* an English Barn modified with extensions; and at least two outbuildings relating to its township production profile, level of mechanization, and cultural patterns. For example, a West Burlington Township, Bradford County farm should have at least two of: detached dairy kitchen (if house lacks a kitchen ell); small poultry house; ice house; wood shed; freestanding granary; carriage shed; shop. There should be evidence of remnant farmstead landscape features such as front yard, dooryard, ornamental plantings,

fencing, and treelines. A **farm** should include, at a minimum, the elements of a farmstead, plus two or more relict landscape features as follows: significant acreage, treelines, small fields, pasture lot, stone fencing remnants, woodlot. A **historic agricultural district** should include contiguous or clearly connected farmsteads that share visual, landscape, and architectural characteristics that date to and are typical of the period. For example, along transportation corridors where strong development took place during this period, there may be clusters of farms whose architecture and landscape elements were built during the period. Not every farmstead or farm in the district would need to possess all the registration requirements; but collectively they should clearly represent the period.

> It is very important to note that not only production patterns, but historic patterns of tenancy, labor, and culture should be clearly represented for any property.

To represent the period 1900-1960 ("Fluid Milk and Poultry") in the Northern Tier Grassland Historic Agricultural Region:

> A **farmstead** should include a house characteristic of the region that either was built during this era or predates it; an older barn with interior dairy alterations (see narrative for specifics) and/or added cow shed; at least two outbuildings relating to its township production profile, level of mechanization, and cultural patterns (where applicable). For most townships this will mean at minimum a silo, milk house, and poultry house. Machine sheds, garages, and workshops are desirable but not essential. In addition, a farmstead should have two or more relict landscape features as follows: yard; ornamental plantings; farm pond. A **farm** should have, in addition to the farmstead elements named above, at least two of the following: significant acreage; wire fencing; woodlots; dirt roads; electrical utility poles; contour stripping. A **historic agricultural district** should include contiguous or clearly connected farmsteads that share visual, landscape, and architectural characteristics that date to and are typical of the period. For example, a cluster of farms on or near a road that was paved in the 1920s might have all undergone a building spurt during that time. Such a district should clearly show milk houses, silos, and barn additions all built within a limited time period.
>
> It is very important to note that not only production patterns, but historic patterns of tenancy, labor, and culture should be clearly represented for any property.

B. Properties may possess a range of buildings and landscape features that illustrate change over time in the region's agricultural history:

> Properties may offer a strong illustration of change over time. Most rural historic properties have evolved over time; therefore most are likely to fit into this category. In general, to qualify for significance under this rubric, a property ought to illustrate the changes in production, farming methods, and labor systems

(including gender patterns and farm tenancy) outlined in the narrative above. The possibilities are quite varied and no list can encompass them all. It should be noted that in illustrating change over time, a farmstead, farm, or historic agricultural district may contain resources from the period of settlement. Please note that the settlement era (to c1830) has been treated for the entire study area in a single document. Please refer to that document to determine the nature of resources from this period. Rather than list all the many ways in which change over time could be illustrated, below are some examples.

Rather than enumerate all the possibilities, some examples are offered. For the Northern Tier Grassland, typical assemblages illustrating key agricultural changes would reflect a shift from one phase to another, such as from diversified home dairying to an emphasis on fluid milk and poultry in the 20th century. In this instance, for a **farmstead,** a 19th century house characteristic of the region, ideally with service ell; a Basement Barn with dairy adaptations; at least one silo; at least one poultry house; and freestanding granary would show change over time. Farmstead landscape elements could include yard, circulation paths, ornamental plantings.

For a **farm**, in addition to the farmstead elements named above, significant acreage that shows continuous patterns of land use, especially as regards pasture and hay production; boundaries, treelines, fences, and relict fields.

For a **historic agricultural district**, the possibilities are numerous; it could include a number of farms that individually show change over time, or 19th-century farms together with 20th-century farms. These should be clearly linked by transportation corridors that helped to shape the changes being illustrated. In the Northern Tier, Route 6 is one example. It is very important to note that not only production patterns, but historic changes in patterns of tenancy, labor, and culture should be clearly represented for any property.

Property Types and Registration Requirements – Criterion B, Association with the lives of Significant Persons

These requirements apply to properties in all regions. To be eligible under Criterion B, a farmstead, farm, or historic agricultural district must establish a documented link to an individual who had a sustained and influential leadership role which resulted in a verifiable impact on local, state, or national agricultural practices, trends, or thought. A "sustained" leadership role would mean long-term involvement in important agricultural organizations such as the Grange, Dairymen's League, rural electric cooperative, and so

on. Impact should be demonstrated, not asserted. An agrarian figure who achieved a higher than usual degree of productivity or prosperity in farming would not normally meet this standard, nor would one who was an early adopter of new agricultural methods or technologies. But, an individual who influenced others to adopt new practices could. For example, Robert Rodale clearly played a foundational role in the rise of the organic farming movement nationally. On a more local level, a hatchery owner who initiated a new industry in an area, thus creating a shift in production patterns on many farms, might qualify.

Property Types and Registration Requirements – Criterion C, Design and Construction

These requirements apply to properties in all regions. Typical examples are encouraged to satisfy Criterion A for agriculture, but average or ordinary examples are not likely to qualify under Criterion C for Design and Construction. A farm or farmstead will not be eligible under Criterion C simply because it has farm buildings that retain integrity. Under Criterion C, to be eligible as property must exhibit the "distinctive characteristics of a type, period, or method of construction or that represent the work of a master, of that possess high artistic values, or, as a rural historic district, that represent a significant and distinguishable entity whose components lack individual distinction".[79]

This MPDF follows the evaluation models established by the 1992 MPDF *Farms in Berks County* and the 1994 MPDF *Historic Farming Resources of Lancaster County,* which defines standards for architectural significance of farm buildings as "a rare or intact example of a period, style or type" or as a "noteworthy example of a particular building type ...".[80] To be eligible under Criterion C for Architecture, a farm building, farmstead, farm, or historic agricultural district must possess physical characteristics that specifically reflect aesthetic, cultural, craftsmanship, or production values associated with regional agriculture and rural life. Farm buildings and structures must exhibit qualities of design, workmanship, and artistic merit that are tied to the period of construction.

This document explains the specific Criterion C issues that apply to farm buildings and structures. Criterion C relates to significance primarily for Architecture, Art, and Engineering. While most farm structures will not be evaluated individually, structures notable for their construction technology or design may factor into the Criterion C significance of a property.

Evaluation conventions for the architectural style of dwellings are well established so they are not covered here. However, what constitutes architectural significance for farm dwellings and agricultural buildings and structures in the area of Agriculture is less widely defined.[81] This section lays out some considerations for how to assess architectural significance for farm buildings and structures based on their engineering and design characteristics related to agriculture.

As with any other architecturally significant building type, resources must conform closely to the seven aspects of integrity. Significance must be demonstrated, not merely asserted.

What does qualify as a significant design?
A barn might qualify if its design reflected essential characteristics of specific barn types, such as Pennsylvania bank barn, Stable barn, English Barn etc. (The salient architectural features of each type are defined within the narratives that accompany this MPDF.) The significant elements of barn layout (location of threshing floors, hay mows, stables, granaries; typical interior organization for a given type; vertical work-flow arrangement where relevant) should retain integrity. The same would be true for outbuildings, for example if a granary or spring house retained essential characteristics of its type. A house, barn, or outbuilding that has been altered or modified to accommodate changing maintenance habits, popular taste, or the convenience of the farmer would not be considered significant unless the new features are demonstrably tied to regional patterns in agricultural buildings and the built environment for the period of significance. For instance, a mid-19th century vernacular farmhouse that was Colonial Revitalized in the early 20th century might be significant for its stylistic features outside this MPDF but would not be architecturally significant under this MPDF because the alterations are not associated with the needs and priorities of farm life. But a farmhouse modified to reflect important transitions in the relationships of farm family members to each other, labor, or the market could be considered significant (such as the addition or removal of quarters for hired hands, cooking facilities for feeding threshing crews, social spaces separated from spaces devoted farm matters, etc). Changes reflecting access to modern amenities and willingness to adopt modern amenities could also be considered significant, such as the addition of a bathroom, running water, a heating plant, or electrification. However, the design features reflecting these changes must be demonstrated to be part of a local or regional pattern of construction; individual, personalized or idiosyncratic alterations that lack design features not adopted elsewhere in the community would not be considered significant under Criterion C, but would support significance under Criterion A for their association with labor and production patterns. In the post-World War 2 era, many farmhouses have undergone dramatic changes in ways that make them indistinguishable from contemporary suburban residences in their materials, styles, amenities, and use. Thus it will be difficult to evaluate the Criterion C significance of post war farmhouses without further study.

Design includes massing, proportion, fenestration, and ornament. Ornamentation will be very important in determining Criterion C eligibility. It could include decorative ironwork (hinges especially); roof-ridge cupolas; gable-end "stars"; painted or trimmed louvers; datestones; painted decorations; cutout designs; cornice detailing; brick-end patterns; and bracketing.

Design could include examples of marked visual relationship of buildings to one another through such qualities as colors (historically), siting, proportions, and materials. Thus significant design can potentially apply to a farmstead or even a historic agricultural district.

Design also includes overall layout of the farmstead or farm, for instance if buildings are arranged in a recognized, regionally typical pattern in orientation and layout, such as linear organization of eastern and central Pennsylvania (as described by Henry Glassie, Joseph Glass, and others); or; farmsteads bisected by a road as is common in the Northern Tier (as described by Trewartha).

What qualifies as significant workmanship?
Workmanship is evidenced in quality of masonry, timber framing, durable construction, including evidence of skilled workmanship in details such as hardware or even nails. Masonry, for example, might exhibit carefully cut stone rather than fieldstone. Another facet of workmanship would be cases where there is a good quality example of particular construction method such as log, *blockstanderbau*, plank, timber frame, Shawver Truss, etc. Workmanship applies primarily to individual buildings.

What qualifies as significant "artistic merit"?
This is the most hard to define category of the three. It connotes skill in achieving desired aesthetic qualities. For example, careful proportions, sensitive siting, and originality of design are important components of aesthetic merit. Again, ornament is where aesthetic merit shows most clearly, for example in locally characteristic designs for hardware, weathervanes, bracketing, and the like.

Examples

Example 1: Hodge Barn, Centre County, c. 1870. This is a double-decker Pennsylvania barn with decorative ornament, double bankside bridges, and struts under the forebay, located in Centre County. This barn would qualify under Architecture because of its design features (double decker with multiple mows and floors), its workmanship (technical mastery represented in bridges, struts, and interior framing), and its artistic merit (decorative ornament).

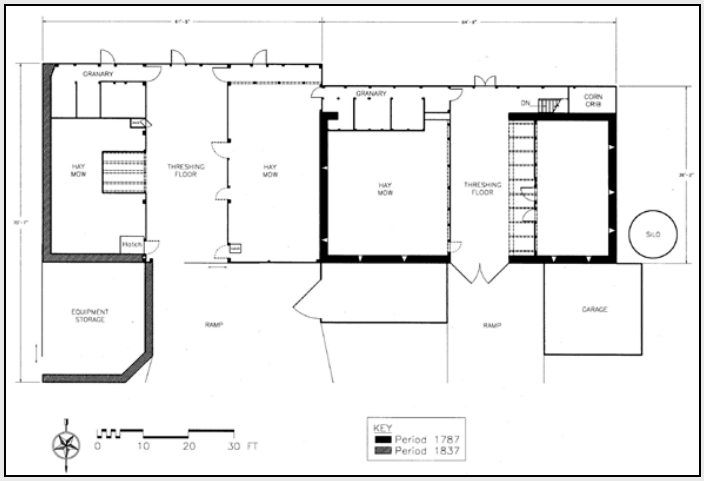
Ornament on Hodge Barn, Centre County

Hodge Barn, Centre County, struts under forebay

Hodge Barn, Centre County, struts under forebay

Example 2. The Bertolet Barn in the Oley Valley of Berks County, 1787 and 1839. This barn shows the evolution of the Pennsylvania Barn. The 1787, stone portion has a Germanic *liegender stuhl* framing system; forebay granary with bins; two mows flanking a threshing floor; and intact stable level. It is significant because of its design (the multi-level system was worked out to perfection), workmanship (the masonry and the timber framing) and artistic merit (in its proportions, materials, etc). The 1787 date is inscribed over the bankside door. The 1839 portion (also dated, thus affording a rare chronological benchmark) is significant for different reasons: it shows adaptations of framing systems, but still assembled with a high degree of skilled workmanship; it shows continuity of design and artistic merit from the earlier portion.

Bertolet Barn, Oley Valley, 1787 and 1839.



Bertolet Barn, Oley Valley, Berks County, floor plan of upper level. University of Delaware Center for Historic Architecture and Design.

Example 3: the Plank Barn in Cumberland County. This brick-end barn was built in 1853. It is significant for its design, workmanship, and artistic merit. Its significant design features clearly include attention to simple proportions. Its workmanship is important in the significant masonry technique needed to create the openwork patterns in the gable ends. Its artistic merit is represented in the diamond motifs. The datestone helps to establish chronological frameworks for these barns. The owner manufactured a local plow and the barn is evidence that he was consolidating his wealth.


Plank Barn, Cumberland County, 1853

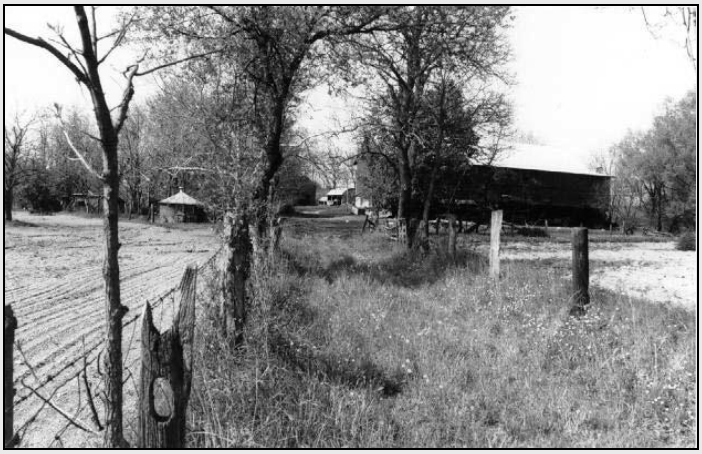
Example 4. Smokehouse, Tulpehocken Manor, Lebanon County, late 18th century. Most examples of architectural significance will likely be larger buildings such as barns, but this smokehouse (in Lebanon County) is an example of a smaller building which might qualify because of its masonry (which qualifies both under workmanship and design, because its decorative corner quoins are clearly ornamental) and the hand-wrought ironwork, which includes a bar against thieves which is inscribed with the owner's name and date. The building clearly exhibits all the characteristics of its type.


Smokehouse, Tulpehocken Manor, Lebanon County, late 18th century

Example 5: Chicken house at Landis Valley Museum, Lancaster County, early twentieth century. Although in poor condition, this chicken house, located in what is now the Landis Valley Farm Museum, embodies the character-defining features of "modern" housing recommended by the extension services and growers associations for optimum management of large flocks. The massing, proportion, and fenestration, as well as the interior arrangement maximize efficient work flow and healthy stock management.

Chicken house at Landis Valley Museum, Lancaster County, early 20th century.

Example 6: Joel Dreibelbis Farm in Berks County. Properties can be significant under Criterion C for reasons other than their architecture. The farm plan with the siting of the buildings in relation to each other and to the surrounding fields make up a carefully planned complex. The spatial organization of the buildings and the land use patterns, which include a wet meadow, reflect traditional German labor and conservation ethics.



Joel Dreibelbis Farm, Berks County, farm lane, fields, outbuildings. Pennsylvania Historic Preservation Bureau file photo.

Property Types and Registration Requirements – Criterion D, Archaeology

These requirements apply to properties in all regions. The examples below are not meant to be an exhaustive list of ways in which a farm or farmstead site could be eligible under Criterion D in Agriculture; instead, they are meant to provide a limited overview of current research into the archaeology of farms or farmsteads and of data that these excavations have yielded. Other datasets could yield significant information about agriculture. In addition, many of these research topics pertain equally well to both demolished and extant farms or farmsteads. In addition, keep in mind that archaeology can be used to support evaluation under any Criterion or area of significance.

To be eligible under Criterion D, a property must "have yielded or…be likely to yield information important in prehistory or history." For Agriculture, although farms and farmsteads may contribute other (or various types of) information to the study of Pennsylvania history important information on archaeological farm properties in Pennsylvania is information that contributes to the understanding of the major themes identified in this context either for the state or for the individual agricultural regions or for both. To recap, these themes include representation of agriculture of one time period or representation of agricultural change over time; representation of typical production, in terms of both production and use; and representation of labor patterns, land tenure, mechanization, and cultural traditions. These requirements should not be considered in a vacuum; they must be examined in the context of the cultural milieu of the historic agricultural regions developed elsewhere in this MPDF.

Based on current research in historical archaeology, the registration requirements for archaeological properties that are farmsteads in Pennsylvania are that the site provide important information on changes to landscape and the built environment over time; on the use of agricultural products; on labor and land tenure; and on cultural patterns. To be eligible under these registration requirements, a site must provide important information on the topics listed below and must also demonstrate integrity. For archaeology, integrity should be measured in light of the current state of archaeological knowledge for that region, the research questions being addressed, and the unit of analysis. For example, the standards of integrity for a region without a robust archaeological record would be less stringent than for an area that is well-documented archaeologically. In addition, a site where the significance lies in its ability to provide information about change over time

should have discrete deposits that can be directly associated with different time periods. The above are only two general examples to guide assessments of integrity.

Change Over Time

Agricultural resources may yield important information about modifications to the landscape to accommodate both farming and changes in farming. The creation of a farm obviously involves alteration of the landscape; archaeology can document this alteration. For example, Mary Beaudry (2001-2002: 137-138), working at Milton Farm in Scotland, was able to document how the landscape was altered to accommodate the creation of a farm dedicated to raising sheep. Excavations revealed the massive drainage efforts that were undertaken to turn the land from marsh into productive pastureland. Therefore, important information would document how farmers modified the landscape to begin farming as well as to keep up with changing agricultural practices in their region.

Archaeology can also provide important information on the evolution of the built environment. "The rendering of a farmstead on an atlas dating to the middle of the 19th century does not mean the site sprang from the ground full blown… (Catts 2001-2002: 145)." Often, buildings were moved or reused over time (Beaudry 2001-2002: 130). In some cases, buildings were never even documented in the historical record or the documentation is contradictory (Garrison 1996: 24, 32). These data can provide important information on how farmers responded to the larger movements and innovations in agricultural practice for their regions, documenting both the degree to which farmers followed the latest prescriptions, and the amount of time it took for these ideas to diffuse from other areas (Beaudry 2001-2002: 130; Catts 2001-2002: 145). Archaeology can also provide important information on how changing patterns of refuse disposal illustrate larger changes in farming practice. For example, archaeologists were able to tie modernization theory into their study of South Carolina farmsteads by examining refuse disposal at these sites (Cabak, Groover, and Inkrot 1999: 35). Comparing the density of artifacts at both "modern" and "traditional" farmsteads, archaeologists were able to document the ways that disposal patterns reflected modernization. In addition, useful features may be filled with refuse later on. Mary Beaudry (1986: 39) documents the filling in of water-related features, pointing out that that process can be related to "…an ongoing series of changes made in response to technological innovations, economic and social pressures…" etc. Catts (2001-2002: 148) also documents a trend of refuse disposal in specific dumping areas away from the farmstead. The timing and reasons for this change could provide important information on the evolution of agricultural practice, as well as on the degree with which innovations diffused from other areas.

Agricultural Production

In terms of production, archaeology can provide important information on agricultural production for a market economy. One of the most fruitful lines of evidence, faunal analysis, has the potential to reveal a great deal of important information regarding how market forces shaped production patterns on farms. By comparing faunal remains from both rural and urban sites in Massachusetts, archaeologists were able to document changes in rural production to meet urban demand (Bowen 1998). The percentage of calves in urban assemblages was much higher than in rural assemblages; therefore, it appears that increased production of milk for urban areas also led to increased production of veal for those same areas. Rather than spend precious resources on animals that were useless for dairying, farmers would sell male calves to urban consumers (Bowen 1998: 143).

Examination of faunal disposal patterns is most profitable when done in conjunction with oral historical or other information (Whittaker 1999: 53-54). In Iowa, for instance, archaeologists found that, in general animals that were slaughtered for farm consumption were generally either burned or discarded; rarely, they were buried. The existence of a large, rapidly filled pit, filled with more remains than would be necessary for a farm family, therefore, pointed out that slaughter for market was taking place at this site (Whittaker 1999: 53-54). These types of data could provide important information on the degree to which individual farms participated in the market system.

Labor and Land Tenure

In terms of labor and land tenure, archaeology can produce important information on the interplay between land tenure and changes over time. For example, archaeologists in Massachusetts were able to correlate changes to the landscape with specific changes in ownership in Estabrook Woods (Garman et al. 1997: 65-66). One owner clearly modified the yard to create better drainage. In addition, as ownership changed, the field layout also changed: earlier field features (mounds for corn cultivation) were incorporated into later field patterns. This type of information could be especially useful if different owners represented different ethnic groups. For example, archaeology could provide important information on the changes wrought when a Welsh family purchased a farm from a Pennsylvania German family, and how those changes are manifested in the archaeological record.

Aside from providing important information on individual farms and individual ownership, archaeology can provide important information on the effects of larger events on the farming culture. For example, during the Napoleonic Wars in Europe, European

demand for American goods (including agricultural products) rose dramatically. With this in mind, archaeology can document the effects of this heightened demand on agricultural production and practice in each agricultural region in Pennsylvania (Garman et al. 1985: 73). In addition, the Civil War was another event that had a dramatic impact on agricultural society. Besides raids, forage, and simply the movement of large bodies of troops across the agricultural landscape, this event occasioned a tremendous loss of life and shortage of manpower after the war. In the southern United States, this loss of manpower hastened the mechanization of many farms. Archaeology could demonstrate how this loss of manpower was manifested in the landscape and material culture of Pennsylvania's agricultural regions (Catts 2001-2002: 149).

Labor and land tenure also ties into several major research themes within historical archaeology, including status (e.g. Miller 1980), class (e.g. McGuire and Walker 1999), and ethnicity (e.g. Stine 1990). In terms of status, the archaeology of Pennsylvania farms can provide important information about the ways in which farmers displayed their status. For instance, investigations in New Jersey suggest that farmers chose to display their status by improving their agricultural holdings, as opposed to participating in the consumer culture (Friedlander 1991: 27). Ceramic and glass artifacts indicated a status position that was not in keeping with the farmer's status as derived from the historic record. Tenant farmers, on the other hand, may have more fully embraced consumer culture since there was little use in improving structures and land that they did not own (Rotman and Nassaney 1997: 56). Archaeology within Pennsylvania's agricultural regions could provide important information on the general applicability of these findings.

Status, in combination with ethnicity and role (owner, tenant, etc.), has the potential to yield important information on the social hierarchy of agriculture. For example, statistical analyses in North Carolina found that the material remains of African American landowners were more similar to those of white tenants than to those of either African American tenants, or white owners (Stine 1990: 40). African American and white tenants, on the other hand, were nearly impossible to distinguish. Overall, ethnicity played a role in the ranking of landholding farmers; however, economics appears to have played a more important role than ethnicity in the rank of tenant farmers. Investigations in Pennsylvania could test this model across regional lines.

Closely related to the above themes of ethnicity, status, and role, is the concept of class. Class has variously been defined as "the relationship of a social group to the means of production" (McGwire and Walker 1999: 160), as a description of a fixed position in

society, and as a relative measure of the relationships between different social groups (Wurst and Fitts 1999: 1). According to some archaeologists, however, regardless of the definition of class, its role has not been sufficiently examined in the archaeological record; the historical archaeology of class has been "meager." (Wurst and Fitts, 1999). Therefore, this concept may yield important information for the study of Pennsylvania agriculture. For example, in New York state, archaeologists examined the manifestations of class between servants and their employers in Binghamton and found that artifact types and locations can represent different classes within the same property and that mixed assemblages may be the result of different class structures on the same property (Wurst 1999: 17). In agricultural regions of Pennsylvania where migrant labor was important, this type of study could produce important information on the differences between the owners and the workers. In addition, Wurst (1999: 13) demonstrated how, at a rural tannery, the owners minimized the material cultural differences between themselves and the workers.

Cultural Patterns

In terms of cultural patterns, archaeology can provide important information about the degree of cultural exchange that took place in agricultural communities (i.e. assimilation and acculturation). In some areas of New Jersey, for example, English and Scottish farmers borrowed certain architectural elements from their Dutch neighbors; archaeology may be able to document this exchange in other areas, such as land use and other material culture. In addition, the historical record indicates that the Dutch maintained many of their ethnic ties, including language; however, other aspects of material culture, such as ceramics, indicate that some cultural exchange was taking place (Scharfenberger and Veit 2001-2002: 68). For Pennsylvania, archaeology can provide important information on assimilation within the cultural milieu of the agricultural regions discussed within this MPDF.

Archaeology can also provide important information about cultural patterns, as manifested in religion and religious practice. For example, in Arkansas, archaeology, in conjunction with the documentary record, was able to document the degree to which one family maintained its Jewish heritage, despite being isolated from any large Jewish congregation. The faunal assemblage demonstrated that this family did not observe kosher law; however, the documentary record points out that the family was active in establishing a synagogue in New Orleans and was still a participant in the larger Jewish world. It appears, therefore, that the family's location in an isolated, non-Jewish area led to certain changes (e.g. not keeping Kosher law), but did not break all of their ties to the Jewish community (Stewart-Abernathy and Ruff 1989: 97 and 105). In Pennsylvania,

archaeological investigations at a Quaker-owned farmstead in Chester County were able to provide important information on the interplay (and contradictions) between Quaker belief and Quaker participation in the larger market system (Bailey et al. 2004:131).

Faunal Studies

Although not one of the overarching themes in Pennsylvania agriculture, faunal analyses have the potential to provide a great deal of important information about the above themes. For example, past archaeological studies have used faunal analyses to examine the use of the landscape and change over time, as well as status. By combining oral history with faunal analysis, archaeologists in Missouri were able to provide information on different processing methods and disposal of fauna (Price 1985: 46-47). For example, smaller animals, such as squirrels, would have been processed in the yard, leaving some bones there. Other bones, however, would have been discarded at the margins of the yard after the meal. Larger animals, such as pigs, would have been slaughtered near the smokehouse (Price 1985: 48). In areas without standing remains, or where spatial relationships are not clear, this data could provide important information on the layout of agricultural properties through time. Also, the use of wild animals in the diet can point out the status of the site's inhabitants. Both higher status and lower status farmers would likely have a larger percentage of wild animals in their diet, either through conscious choice, or due to economics (Scharfenberger and Veit 2001-2002: 64).

Conclusion

The registration requirements for archaeological properties that are farmsteads in Pennsylvania are that they must provide important information on the themes developed in this MPDF. It is important that the important information relate not only to the themes, but also to the themes as they are manifested in each agricultural region. Broadly, these themes are change over time, agricultural production, labor and land tenure, and cultural patterns. In addition, a separate category, faunal analysis, has the potential to yield important information on several of the themes identified in the MPDF. Aside from significance, as represented by the potential to yield important information, farmsteads must also display integrity. The assessment of integrity should be based on the archaeological record of a particular region, as well as the research questions and the unit of analysis.

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Statement of Integrity

This Statement of Integrity discusses the seven categories of integrity as defined by the National Register, for each of the three Property Types (farmstead, farm, historic agricultural district) defined in this context. This statement applies to properties in all regions.

Location:

Integrity of Location refers to the requirement that buildings and landscape elements remain in their original location. Normally, a building loses eligibility if it has been moved. However, where a farmstead is concerned, farm buildings present a challenge to the normally straightforward rule. Historically it has been very common to move and reuse farm buildings. Some, like poultry houses, were actually designed to be easily moved. Other types of smaller farm buildings were frequently rearranged. The New England Connected Farm complex, for example, resulted from moving buildings. Therefore, if an agricultural building has been moved, and the change in location can be interpreted as a reflection of changing agricultural patterns, integrity of location has not been compromised. If a farm building has been moved or reused after the period it is supposed to represent, integrity of location is not present.

Integrity of Location for a farm is well defined by the SR 30 context, which says "an agricultural property must be located either where it was constructed or where important trends or patterns in agriculture occurred…. Siting with respect to natural features and topography, use of local and indigenous materials, relationship to roadways, the presence of native species… and other responses to the natural environment all add to integrity of location."[82]

Integrity of Location by definition is present in a historic agricultural district, as it is unlikely that an entire area would be relocated.

Design:
To quote the Georgia agricultural context, design is the "combination of natural and cultural elements that create the form, plan, style, and spatial organization of a property."[83]

For individual farmstead buildings, design includes such elements as siting, orientation, form, massing, proportion, fenestration, location of doors, roof types, and ornament. Integrity of Design applies to both exterior and interior elements. For houses, interior integrity is well established elsewhere; for barns and outbuildings, interior integrity of design refers to the presence of significant plan elements characteristic of a given barn type. So, for example, an English Barn should retain the characteristic one-level, three-bay layout with mow, threshing floor, and stables arranged crosswise to the roof ridge. A Pennsylvania Barn should exhibit the characteristic multi-level work-flow arrangement, and the diagnostic features of the type (forebay, banked construction, and so forth.) Another aspect of interior design would be framing systems; while these are covered under Workmanship, they also fall under Design because often they were assembled to permit hay tracks, expand storage space, and delineate spatial divisions both vertically and horizontally. Barn and outbuilding interior alterations that show significant agricultural changes in a region do not compromise integrity, because they can contribute to significance based on change over time. However, if they postdate the period of significance and/or obliterate historical fabric, then integrity is not present. For example, a Pennsylvania Barn whose lower level was cemented and fitted with stanchions for dairy cows in the 1930s could retain integrity because it illustrates changes within a period of significance, but if its entire lower level was gutted, expanded, cemented, with new partitions in the 1980s, it would likely not retain integrity.
Farmstead layout and the relationship of buildings to topography are important elements in Integrity of Design. Farm layout should retain integrity with respect to farm labor patterns for the period of significance in the region where the farmstead is located. In most cases, this means spatial organization to facilitate family and neighborhood labor. So, for most pre-1930 farms, a poultry house, detached dairy house, or hog facility should show a siting relationship to both house and barn, usually being situated between house and barn, or in a clear relationship to the house's dooryard (as in the Yankee Northern Tier) or *vorhof* (more common in German Pennsylvania), or in an arrangement where all buildings are closely clustered. Integrity of farmstead design also can apply to characteristic cultural or regional patterns. In the Northern Tier, for example, it was common for a road to bisect the farmstead, whereas in German Pennsylvania, a linear or court-yard organization was more prevalent.

For farmstead landscape elements, Integrity of Design applies to whether the farmstead retains traces of the fabric and location of boundaries, lawns, fences, ponds, circulation elements (paths, drives), gardens, farm lanes, orchards, and ornamental plantings. It would be rare for these to survive in their entirety, but some vestiges should be present.

Integrity of Design also applies to the collection of buildings on a farmstead. Most farmsteads will contain a mix of contributing and noncontributing buildings and structures. A determination must be made as to whether there is too high a presence of noncontributing elements. In such cases, it is important that the farmstead adequately reflect the composite patterns of the relevant agricultural region and period. For example, a farmstead might have an early wood-stave silo, a c. 1940 concrete stave silo, and a c. 1975 Harvestore silo all clustered together, next to a barn complex that includes a c. 1900 Northern Basement barn, a milk house, and a c. 1950 cow shed. In this context, the noncontributing Harvestore silo does not detract from Integrity of Design, because its scale and siting relate to the historical fabric. On the other hand, a farmstead may have a Pennsylvania Barn surrounded by a 1990s livestock loafing shed twice its size, and a 1980s manure lagoon. If modern livestock-handling facilities dwarf the historic building in scale, or if they are sited so close as to overshadow the historic fabric, then Integrity of Design is doubtful. However, it should be noted that in many cases, modern livestock handling facilities are sited away from older buildings, and in these cases (especially if the modern facilities are all concentrated in one place), Integrity of Design may still be present. Scale and location should be considered in determining Integrity of Design in cases like these.

At the farm scale, Integrity of Design is present only when a significant proportion of acreage remains. It is desirable, though not an absolute requirement, if continuity of use is present – ie crop production, pasture, livestock raising, and so on. In addition, a farm's Integrity of Design depends on the extent to which it retains traces of field divisions, fields (such as small fields or historic strip cropping) property boundaries, treelines, hedgerows, fencing, woodlots, circulation paths, and the like. If continuity of use is present, it is unlikely that all historic landscape features will have survived intact, because of the needs of modern farming; but at least some traces should be evident. If large-scale monocropping resulted in the removal of field boundaries, woodlots, treelines, fencing, and circulation paths in the 1990s, Integrity of Design may have been lost.

A historic agricultural district retains Integrity of Design when its constituent farms have an acceptable level of integrity collectively. Since contributing resources are counted

individually (so, each resource, even within a farmstead, would be counted), this must be determined with respect to whether and how the sum total of contributing resources creates a coherent whole. For example, there may be cases in which one or two farms are included because they have one outstanding building, even though its other resources are not exceptional. But overall, there should be a consistent presence of contributing resources on farms that make up the district. Also, elements of the historic transportation routes, waterways, etc. that connected the farms in the district should remain.

A historic agricultural district's integrity of design depends very much upon landscape features. Intact historic field patterns, treelines, ponds, disposition of pasture and woodlot, etc. should count heavily in an assessment of integrity in a district. Consider also that since farm fields, waterways, and woodlots are such crucial components of an agricultural district, their integrity should weigh equally with architectural integrity of buildings. So for example, a district might contain buildings where there has been some impairment to integrity, but if many landscape features are clearly intact, the overall district's integrity would still meet National Register standards. Another example would be a situation where small patches of modern development are interspersed within the boundaries of a historic agricultural district. In a case like this, the total number of noncontributing resources might be relatively high, but overall integrity would still meet National Register standards because the land area occupied by the intrusions would be minimal compared with the total area taken up by the district.

Setting:
Integrity of Setting with respect to a farmstead has two dimensions. Integrity of Setting can be present with respect to the farmstead's interior organization, for example if it retains its original relationships among buildings, natural features, and landscape elements that make up the farmstead. Integrity of Setting also applies to the farmstead's surroundings, so at least part of a farmstead (one or two sides at least) should border on open space, woodland, or agricultural land. If a literal spatial buffer is not present, Integrity of Setting may still be present if the farmstead retains visual buffers. For example, what if a farmstead lacks much original acreage, and abuts on a modern subdivision? It may retain Integrity of Setting if it is visually set off from the subdivision through such means as topographical features. However, if not, the farmstead probably does not retain Integrity of Setting.

Integrity of Setting with respect to a farm normally involves continuity of use. There may, however, be cases where continued farming with modern methods has all but wiped out historic farm landscape elements such as patterns of crop rotation and field

organization, hedgerows, treelines, shade trees, rock piles, fencelines, fences, and the like. In extreme instances, Integrity of Setting may be compromised by continuous farming. An example would be if 1930s aerial photographs showed all of these features, and a present-day site visit showed that a large monocropped field had supplanted these earlier farm landscape features. Integrity of Setting for a farm is also present if a farm abuts open land, woodland, and/or historic transportation corridors.
Integrity of Setting with respect to a historic agricultural district can be reckoned with respect to internal relationships among buildings, landscapes, natural features, and transportation corridors. So for example a district along a historic canal corridor should include canal features like locks, masonry lining, and the like; a district in a sharecropping region should include a number of farms that were historically and thus architecturally interrelated. A historic agricultural district possesses Integrity of Setting if its external surroundings continue to reflect general historic patterns and use.

Materials:
Integrity of Materials refers to the presence of "key exterior materials from the period of significance"[84] Integrity of Materials is well covered for houses elsewhere. For the other buildings of the farmstead, barns and outbuildings often are constructed, or reconstructed, of recycled materials, and integrity of materials is present as long as the recycling can be interpreted as contributing to significance for agriculture. On a farm property, some materials may be organic – such as a fenceline made of rubble, trees, and spontaneous growth. (However, the original vegetative material of crops, or the original fence, does not need to be present.). A historic agricultural district retains Integrity of Materials if its constituent properties possess Integrity of Materials collectively. As well, in districts Integrity of Materials can refer to the presence of key materials across property boundaries, or along shared property boundaries. Remnants of irrigation systems would be an example.

Workmanship:
Integrity of Workmanship refers to the retention of traditional or historic craftsmanship. These include such familiar skills as wood joinery (log, plank, post and beam framing), masonry (stone and brick), but also skills more closely related to agriculture such as fence building, contour plowing, windbreak planting, crop rotation, garden construction, farm pond construction, or farm planning. Workmanship can also refer to the skilled use of technologies that are not necessarily hand-tool derived. For example, the Shawver Truss, a barn framing system popular c. 1900, combined artisan skill with industrial technologies. Evidence of recycling or reuse may contribute, as long as it is part of a pattern or historic trend. Integrity of Workmanship applies mainly to the farmstead

buildings and landscape features. However, collectively Workmanship could conceivably have an impact on the overall appearance of a historic agricultural district in some instances, for example, if in a district a group of farms collectively exhibits particularly adroit arrangement of contour strips.

Feeling:

Integrity of Feeling refers to the "Ability to evoke the aesthetic sense of a particular time and place."[85] This is an intangible quality, which depends to some extent on integrity of design, setting, materials, and workmanship. If the farmstead, farm, historic agricultural district, or the general area continues under agricultural use, integrity of feeling is enhanced. Integrity of Feeling also is present if a property retains a sense of scale characteristic for its period; the interrelationship of the human and natural that is so important in agriculture; if there are many vantage points from which agricultural activity or evidence of agricultural activity are vividly apparent.

Association:

Integrity of Association refers to the "direct link between the property and the… events and persons that shaped it."[86] For significance with respect to agriculture, a farmstead or farm must have contributed to a working farm for its period of significance. The presence of historic landscape features related to agriculture is a key aspect of Integrity of Association. Close attention should be paid to identifying intact or remnant features. For example, are crop field size, scale, shape, and patterns are retained from the pre-contour stripping era? Are there remnants of early woodlots or sugar bushes? Is there evidence of land use such as pasturing? A majority of farms in a historic agricultural district should have a continued association with agriculture for the period of significance. To ensure Integrity of Association, the inevitable "intrusions" should be kept to a minimum. However, a historic agricultural district could conceivably have a high percentage of noncontributing properties relative to an urban district. For example, a concentrated 25-acre subdivision with 50 noncontributing houses might be contained within a 1,000-acre historic agricultural district with fifty contributing farms. Even though technically, the subdivision elevates the percentage of noncontributing properties, it does not reduce Integrity of Association, because it is such a small percentage relative to the continuously farmed (and contributing) acreage in the remainder of the district land area.

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Endnotes

[1] Franklin Menges, *Soils of Pennsylvania* (Harrisburg: W.S. Ray, 1914), page 48 facing.
[2] Jerome Pasto and Pritam S. Dhillon. "Farm Production Trends in Pennsylvania to 1960," Pennsylvania State Agricultural Experiment Station Bulletin # 693, 1962, 33.
[3] E. Willard Miller, *A Geography of Pennsylvania*, (University Park, Pennsylvania: Pennsylvania State University Press, 1995), 53, 72, map page 69.

[4] Answers to Interrogatories, Pennsylvania State Archives, Record Group 28; Treasury Department, Box 1, Board of Revenue Commissioners 1845-1863, Folder 4, 1845. See also the U. S. Patent Office Report, 1851, 259. A contributor from Montrose, Susquehanna County, notes that a great deal of butter and cheese is sent out via rail and that cattle are driven out. Also, the 1855 Annual Report of the State Board of Agriculture letter from Susquehanna County, 243, notes that butter in firkins is shipped to the New York market. The Annual Report for the State Board of Agriculture from Tioga County, 300, notes this is "the first quality of butter-land."
[5] This estimate is based on the assumption that Pennsylvania hay yields were consistently around one ton per acre almost everywhere in the state at least until the late 19th century. Evidence from many sources suggests this. Of course there were pockets of intensive treatment of meadows, and exceptional years in either an upward or downward direction, but the consistency is quite apparent.
[6] Evidence for this shift is scarce, but the manuscript census for 1850 shows that oxen weren't uncommon, while by 1880 they had disappeared.
[7] *National Stockman and Farmer*, February 12, 1891, 1030.
[8] Clement Ferdinand Heverly, *History and Geography of Bradford County, Pennsylvania, 1615–1924* (Towanda, Pennsylvania: Bradford County Historical Society, 1926).
[9] Richard Edwards, *Industries of Pennsylvania… Statistical and Trade Review* (Philadelphia, 1882), 61.
[10] Edward Glover, *Centennial History of Knoxville Tioga County Pennsylvania* (Elkland, PA, 1951).
[11] David Craft, *History of Bradford County, Pennsylvania: With Illustrations and Biographical*
Sketches of Some of its Prominent Men and Pioneers (Philadelphia: L.H. Everts & Co., 1878), 258; Alfred
Mathews, *History of Wayne, Pike and Monroe Counties, Pennsylvania* (Philadelphia: R. T. Peck & Co., 1886), 325-329.
[12] Alfred Mathews, *History of Wayne…,* 257. The Wayne County Agricultural Extension Agent's Report for 1920 also says apples are an important cash crop.
[13] See River Valleys Diversified Farming and Tobacco narrative for more discussion.
[14] *Nonpopulation Census of Pennsylvania, Agriculture. 1880*. Tons Hay divided by Acres Mown. In Susquehanna and Bradford Counties, hay per acre ranged from .6 ton to

1.3 ton, with most right around one ton per acre. More testimony as to the dairy and grassland nature of local agriculture is found in John Franklin Meginness**,** *History of Tioga County, Pennsylvania…* (Harrisburg: R.C. Brown, 1897) 117; *History of Tioga County, Pennsylvania*, 1883, 61-2.

[15] William Egle, *History of the Commonwealth of Pennsylvania* (Philadelphia: E. M. Gardner, 1883), 408, 1088; *Harford Township, Susquehanna County, Pennsylvania*. (Harford, Pennsylvania: Harford Sesqui-Centennial Committee, 1940), 350; See also *Pennsylvania Historical Review: Gazetteer, Post-Office, Express and Telegraph Guide/ City of Philadelphia: Leading Merchants and Manufacturers* (New York: Historical Pub. Co., 1886), 41 and 50; Annual Report, State Board of Agriculture, 1889, Bradford County notes; Glover, *Centennial History of Knoxville*, 61.

[16] The manuscript census shows this clearly. Very few farms listed milk sold. The Annual Report of the Pennsylvania Board of Agriculture for 1883, 30-31, lists the results of a survey of correspondents about dairying. Wyoming, Susquehanna, Tioga, and Potter Counties sold most of their butter out of the county, to New York state and the oil and anthracite regions. None of these counties declared more than 10 percent of its milk sold outside the county.

[17] *National Stockman and Farmer,* February 12, 1891, 1030; and June 9, 1892, 181.

[18] And of course the content of "competency" changed over time. One family's competency was another's poverty, and so forth.

[19] Henry Bradsby, *History of Bradford County*, *Pennsylvania*… (Chicago: S.B. Nelson & Co., 1891), 2, extolled the county as a place where there were "no powerful land barons…with their swarms of attendant serfs and poverty."

[20] While the milking season did become more extended during this period, in general, dairying was still seasonal. See Sally Ann McMurry, *Transforming Rural Life: Dairying Families and Agricultural Change, 1820–1885* (Baltimore: Johns Hopkins University Press, 1995).

[21] Ada M. Warner, *Diary of Ada M.Warner of Bradford County, Pennsylvania*, 1873–1886 (The Pennsylvania State University's Special Collections Library).

[22] In the Craft history of Bradford County, see the following illustrations: William H. Bates (wing behind main house); Henry McKinney (wing behind main house and freestanding structure); George Lyon; A. E. Smith; Chandler Canfield; Joseph Towner; John McKean; E. R. Vaughan. Henry Glassie, *Pattern in the Material Folk Culture of the Eastern United States* (Philadelphia: University of Pennsylvania Press, 1971), 132-3, illustrates some of these types.

[23] As discussed by Thomas Hubka in his *Big House, Little House, Back House, Barn: The Connected Farm Buildings of New England*. 2nd ed. (Hanover, New Hampshire: University Press of New England, 2004).

[24] See for example images of the Joseph McKinney property, Athens Township; Ezra Rutty property, North Towanda Township; S. W. Elliott property, Rome Township. In

Barns (New York: W.W. Norton, 2003), 31, J.M. Vlach shows a 1900 three-bay, log barn at Coudersport, Potter Co., drawn by HABS in 1936.

[25] Henry Glassie, "The Variation of Concepts Within Tradition: Barn Building in Otsego County, New York," in *Geoscience and Man* 5 (June 10, 1974): 177–235, 185. See also Allen G. Noble, *Wood, Brick, and Stone* (volume 2), 39-43.

[26] Illustrations appear in Craft's 1878 engravings of farms owned by William H. Bates, George W. Griffin, Stephen Evans, Silas Mills, H. B. Chaffee, Chandler Canfield, John Salisbury, John McKean, Benjamin Lyon, M. Coleman, Henry Gibbs, J. V. Ballard, and Bascom Taylor.

[27] Possible ice house illustrations (from the 1878 David Craft county history of Bradford): Barker Brown; George Lyon, H. B. Chaffee; Mrs. A. E. Smith, Joseph Towner, E. R. Vaughan; G. W. Brown.

[28] Thomas Visser, *Field Guide to New England Barns and Farm Buildings* (Hanover, New Hampshire: University Press of New England, 1997), 125-128.

[29] Visser, *Field Guide,* 145.

[30] Rutland Township Directory (Tri-Counties Genealogy and History Website) at http://www.rootsweb.com/~srgp/director/1899p421.htm.

[31] Charles Bump, *Down the Historic Susquehanna: A Summer's Jaunt from Otsego to the Chesapeake* (Baltimore: Sun Printing, 1899), 76. J. Trowbridge is being quoted here. See also *Tioga County Centennial Celebration, 1804–1904* (Wellsboro, Pennsylvania: Tioga County Centennial Commission, By Authority of the Centennial Commission, 1905), 151-2, where Edward B. Dorsett notes that the hemlock and pine is mostly cleared, and that many farms still have "stumps and stones" in their fields.

[32] Pennsylvania State Board of Agriculture Annual Report, 1882, 262-3.

[33] Gerald L. Pocius, "Walls and Fences in Susquehanna County, Pennsylvania," *Pennsylvania Folklife* Spring 1977: 9-20. See also *The Settler,* November 1956, 166.

[34] F.W. Beers, *Atlas of Bradford County, Pennsylvania… Assisted by Geo. P. Sanford & others*. New York: F.W. Beers, A. D. Ellis & G.G. Soule, 1869; F.W. Beers, *Atlas of Susquehanna Co., Pennsylvania, From Actual Surveys…*(New York: Pomeroy and Co., 1872).

[35] Ralph Watts, *Rural Pennsylvania* (New York: The Macmillan Co., 1925), 136, notes that Susquehanna, Bradford, Tioga, and Wayne led the state in declines of rural population after 1880. See also Alfred M. Paxton, "The Incidence and Influence of Socialization Factors in Tioga County, PA," Penn State MA thesis, Rural Sociology, 1928, which contains many pictures of abandoned farms and notes other community changes.

[36] See for example "Rural Organization of Bradford County," Penn State Agricultural Experiment Station Bulletin # 524, 1950; Edmund de S. Brunner, *Village Communities* (New York: George H. Doran & Co., 1927), whose 1927 description of "Alford" described the neighborhood of Wyalusing in Bradford County. Also, the Community Program Studies, The Pennsylvania State University Department of Agricultural

Economics and Rural Sociology, survey materials for Troy, Bradford County give a sense of population characteristics.

[37] See Paul K. Conkin, *A Revolution Down on the Farm* (Lexington: University of Kentucky Press, 2009.)

[38]Norman C. Dale, "Agriculture in Susquehanna County Pennsylvania," MS Thesis, Penn State Department of Agricultural Economics, 1932, 22-30, says that Susquehanna County shifted from home dairy to fluid milk within a decade, from 1880 to 1890, and that 80% of the cattle were purebred when he wrote, and that dairy accounted for more than 50% of farm income. The average dairy herd had about 14 cows. Northern Tier figures: Bradford, 1884: 15.7 million gallons milk X 14 lbs/gallon = 220.5 million pounds total; 4.7 million pound butter made, time 20 (pounds milk to make a pound of butter) = 94 million pounds of milk made into farm butter, divided by 220.5 = 46 percent of farm milk made into butter – almost 10% below the state average for 1890.
Susquehanna County, 1884: 12.4 million gallons milk times 14 = 173.6 pounds; 3 million lbs butter made, time 20 lbs milk:1 lb butter = 60 million lbs, divided by 173.6 = only 34 percent of milk converted to farm made butter
Tioga County: 1884 – 10 millions gallons milk times 14 = 140 million pounds milk; 2.7 million pounds butter made on farms, times 20 = 54 million pounds milk made into butter on farms divided by 140 = 38 percent of milk converted to farm made butter. Wayne County, 1884: 7.5 million lbs milk times 14 = 105 million pounds milk produced on farms; 1.7 million pounds butter produced on farm X 20 = 34 millions; 34/105 = 32 percent of farm produced milk converted to butter.

[39]Emil Rauchenstein and F. P. Weaver, "Types of Farming in Pennsylvania," Pennsylvania Agricultural Experiment Station Bulletin # 305, 1934, 54.

[40] Susquehanna County Agricultural Extension Agent Annual Report, 1936.

[41] Both the extension agent report and McCord's farm management survey of Tioga County estimate that herds were only 10 percent purebreds. J. E. McCord, "Farm Management Survey of Tioga County PA," Penn State University Agricultural Experiment Station Bulletin # 282, 1932.

[42] "Milkshed" is a term used to indicate the area from which a major urban area imports milk – the imaginary equivalent to a watershed. It changes with transportation; New York City's milkshed extended just a few miles from the city center in the mid 19th century, and well into Northern Pennsylvania by the late nineteenth and early twentieth century, and into Central Pennsylvania by about 1930.

[43] Susquehanna County Agricultural Extension Agent Report, 1922.

[44] Rauchenstein and Weaver, "Types of Farming," 54.

[45] Bradford County Agricultural Extension Agent Annual Report, 1940.

[46] Rauchenstein and Weaver, "Types of Farming," 54-6.

[47] See also *Historical, Industrial, Commercial and Agricultural Review of Pennsylvania*, 1917 (Chicago: George F. Cram Co., 1917), 13, says Bradford County has 3,898 bee colonies. For buckwheat in Tioga, see *National Stockman and Farmer* June 9, 1892: 181.

[48] Bradford County Agricultural Extension Agent Report, 1941.
[49] Agricultural Extension Agent Reports: Bradford County, 1921; Potter County, 1916; Susquehanna County, 1921. See also Hal Barron, *Mixed Harvest, the Great Transformation in the Rural North 1870-1930* (Chapel Hill, N.C.: University of North Carolina Press, 1997), especially chapter three.
[50] Tioga County Soil Survey 1929, 7.
[51] Glenn Trewartha, "Some Regional Characteristics of American Farmsteads," *Annals of the Association of American Geographers* 38, No. 3 (September 1948): 169–225. He did not analyze housing according to age.
[52] Hall, I. F. "An Economic Study of Farm Buildings in New York," Cornell University Agricultural Experiment Station Bulletin # 478, May 1929, 39, 54-5, 75, 42.
[53] M. C. Betts and M. A. R. Kelley, "Suggestions for the Improvement of old Bank Dairy Barns," USDA Circular 166 (Washington, D. C., June 1931.
[54] H. J. Barre and L. L. Sammet, *Farm Structures* (New York: Wiley, 1950), chapter on "Dairy Buildings;" "Loose Housing or Stanchion Type Barns for Dairy Cattle," University of Wisconsin College of Agriculture Bulletin, June 1953.
[55] Roger Grout, "Construction of Pole-Type Buildings," Penn State Agricultural Extension Circular # 437, 1954; William Gilman, "A Barn They Drive Miles to See," *Farm Journal,* July 1952: 32-33 (this describes a New York State open stall dairy barn setup).
[56] Dale, "Agriculture in Susquehanna County," 9.
[57] I.F. Hall, "An Economic Study… 60.
[58] S. I. Bechdel, "Suggestions for Selecting and Building a Silo," Pennsylvania State College Agricultural Extension Circular # 72, February 1918.
[59] See Allen Noble, *Wood, Brick, and Stone*…
[60] The New York City "Dairy Report Card" is reproduced in I. F. Hall, "An Economic Study of Farm Buildings in New York," Cornell University Agricultural Experiment Station Bulletin #478, 1929, pp. 29-34.
[61] Stevenson W. Fletcher, *Pennsylvania Agriculture and Country Life.* Two volumes. (Harrisburg: Pennsylvania Historical and Museum Commission, 1950–1955), Volume 2, 217-219.
[62] Plans referred to are from *Farm Building and Equipment Plans and Information Series.*
[63]For illustrations, see advertisements, *Farm Journal*, March 1922 and January 1922.
[64] C. S. Platt, "Battery Brooding," *Farm Journal*, January 1930, 22.
[65] D. Kennard, "A New Deal for Chickens," *Farm Journal*, July 1933, 5.
[66] Platt, "Battery Brooding."
[67] C. S. Platt, "Four Weeks in Batteries," *Farm Journal* December 1930, 11; on continuation of free range practice, see ads in *Farm Journal*, September 1951, 92; D. C. Kennard, "Revolution in Hen-Coops," *Farm Journal* March 1932, 14; Nathan Koenig, "Henhouses from Left-Overs," *Farm Journal*, June 1930, 31-32.

[68] On new construction techniques, almost any issue of *Farm Journal* for 1958 and 1959 contains ads illustrating them. See also "New pre-fab poultry houses," Buildings column, *Farm Journal,* May 1957.

[69] The Bradford County Agricultural Extension Agent's Report for 1941 mentions BradCo's role in supplying building plans.

[70] Setups for producing eggs for hatching differed yet again – these were geared to breeding pullets and feeding them up so they would produce healthy hatchable eggs, then selling the fertile eggs to hatcheries, which then hatched them to sell to poultry people. See C. O. Dossin, "Hatching Egg Production in Pennsylvania," *Pennsylvania State College Agricultural Extension Circular #361*, April 1950. This shows the pullets who will lay these eggs on a free range in which they are let out on Ladino or clover range, and have low gable-roof shelters and open air nesting boxes. We found none of these.

[71] These machines were mentioned in the Simmons, Charles Shaffer, *Soil Survey of Wayne County, Pennsylvania* (Washington, D.C.: The Service, 1938), 10.

[72] H. B. Josephson, et al, "A Farm Machinery Survey of Selected Districts in Pennsylvania," Pennsylvania Agricultural Experiment Station Bulletin #237, 1929**.**

[73] "Pole-Type Buildings … From STEEL," *Farm Journal*, October 1957. See also "New Frameless Building," *Farm Journal*, April 1959: 76.

[74] For illustration, *Farm Journal*, July 1957.

[75] Ivy M. Howard, "Crazy Patch Fields," *Farm Journal,* August 1935, 26.

[76] Potter County Agricultural Extension Agent's Report 1948, 24.

[77] Note that while the *buildings* represent an identifiable cultural tradition, the *owners or occupants* may not have necessarily share the same cultural heritage over the entire history of the property. People borrowed, reused, and adapted. For example, an "English" farmer in southeastern Pennsylvania may have built a Sweitzer barn because it best suited the diversified farming of the region.

[78] In some places, only some farmers owned machinery, and it was shared around, so some farms would have lots of machinery buildings and others would have few. This was not true in the regions researched for this context.

[79] NR Bulletin 15, *How to Apply the National Register Criteria for Evaluation*, (2002), 2.

[80] *Historic Farming Resources of Lancaster County*, MPDF, 1994.

[81] In addition see the discussion of the regional architecture of farm buildings in the MPDFs *Farms in Berks County* (1992) and *Historic Farming Resources of Lancaster County* (1994).

[82] "Corridor Improvement Study, Reconnaissance Survey and Historic Contexts Report.. SR 0030, Section S01, East Lampeter, Leacock, Strasburg, Paradise, Salisbury, and Sadsbury Townships, Lancaster County., Pennsylvania." 2 Volumes. Prepared by A.D. Marble Company; 2004, Volume I, page 175. The SR 30 study involved an exhaustive survey of all resources in the multi-township area of Lancaster County and preparation of contexts for agriculture, industry, and several other themes. For agriculture the study identified character-defining features for both English and Plain Sect farms.

[83] "Tilling the Earth: Georgia's Historic Agricultural Heritage, A Context." Prepared for the Georgia Department of Natural Resources, Historic Preservation Division, by Denise P. Messick, J. W. Joseph, and Natalie P. Adams, New South Associates, Inc. 2001. http://hpd.dnr.state.ga.us/assets/documents/tilling_the_earth.pdf

[84] Ibid.

[85] Ibid.

[86] Ibid.