

---

Agricultural Resources of Pennsylvania, c. 1700-1960

**Lancaster Plain, c. 1730-1960**

---

## Table of Contents

Lancaster Plain Historic Agricultural Region, c. 1730-1960.....	4
Location .....	9
Climate, Soils, and Topography.....	10
Historical Farming Systems.....	12
Diverse Production for Diverse Uses, c. 1730 to about 1780.....	12
Products, c 1730-1780 .....	12
Labor and Land Tenure, 1730-1780 .....	16
Buildings and Landscapes, 1730-1780 .....	17
Farm House, 1730-1780.....	17
Ancillary houses, 1730-1780 .....	19
Barns, 1730-1780.....	19
Outbuildings, c 1730-1780: .....	20
Landscape Features, c 1730-1780.....	20
Diversified Production, Intensification, and Livestock Raising, c. 1780-1865 .....	21
Products, c. 1780-1865 .....	21
Labor and Land Tenure, c. 1780-1865.....	29
Buildings and Landscapes, c 1780-1865 .....	30
Farm House, c 1780-1865.....	30
Tenant House, c 1780-1865 .....	33
Barns, c 1780-1865 .....	33
Still house, c 1780-1865 .....	38
Lime Kiln, c 1780-1865.....	39
Spring house, c 1780-1865 .....	40
Smoke house, c. 1780-1865 .....	40
Summer kitchen, c 1780-1865 .....	42
Landscape, c 1780-1865 .....	45
Crops, Livestock, and Tobacco, c 1865- about 1920.....	46
Products, 1865-about 1920 .....	46
Labor and Land Tenure, 1865-about 1920 .....	57
Buildings and Landscapes, c. 1865- about 1920.....	62
Houses, 1865-1920 .....	62
Barns, 1865-1920.....	64
Tobacco Barn, 1865-1920.....	70
Summer Kitchen, 1865-1920 .....	76
Poultry House, 1865-1920 .....	79
Machine Shed/Corn Crib, c 1865-1920 .....	83
Greenhouse, c 1865-1920 .....	85
Windmill, c 1854-1920 .....	85
Ice House, c 1865-1920 .....	86
Silo, c 1865-1920.....	87
Landscape, 1865-1920 .....	89
Livestock, Tobacco, Truck Farming, and Poultry, c 1920-1960 .....	92
Products, 1920-1960 .....	92
Labor and Land Tenure, 1920-1960 .....	105

Buildings and Landscapes, 1920-1960 .....	108
Farm House, 1920-1960.....	108
Barns, 1920-1960 .....	108
Tobacco Barn, 1920-1960.....	113
Milk House, 1920-1960 .....	113
Machine Shed, 1920-1960 .....	115
Hog House, 1920-1960 .....	117
Poultry Housing, 1920-1960.....	117
Stable, 1920-1960 .....	126
Pump House, 1920-1960.....	127
Garage, 1920-1960.....	127
Silo, 1920-1960.....	127
Greenhouse, 1920-1960 .....	129
Landscape Features, 1920-1960.....	130
Property Types and Registration Requirements – Criterion A, Agriculture.....	136
Registration Requirements for Pennsylvania as a Whole .....	136
Registration Requirements for the Lancaster Plain Historic Agricultural Region .....	142
Property Types and Registration Requirements – Criterion B, Association with the lives of Significant Persons.....	145
Property Types and Registration Requirements – Criterion C, Design and Construction.....	146
Property Types and Registration Requirements – Criterion D, Archaeology .....	153
Statement of Integrity .....	159
Bibliography.....	165
Endnotes.....	167

This document is a parallel to the official National Register MPDF narrative. The two versions are not identical, but they contain the same information differently organized. National Register policy prohibits embedded images in official documentation. These PDF versions re-integrate the images for the reader's convenience. The National Register documentation was completed and submitted piecemeal. This PDF document reflects the updates made during the process of making statewide coverage together, again for the reader's convenience.

### **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."<sup>1</sup> 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.<sup>2</sup>

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.

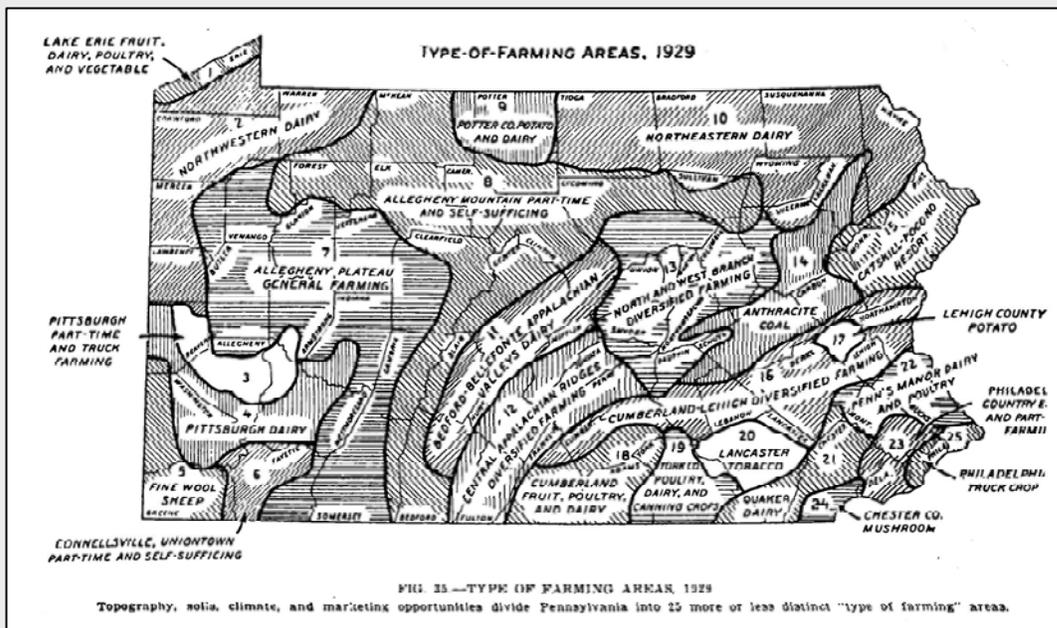
Acknowledging the historic diversity of Pennsylvania farm productions helps to clarify much, but it also raises a fundamental challenge for conceptualizing an approach that will faithfully convey Pennsylvania’s agricultural history, and make

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.

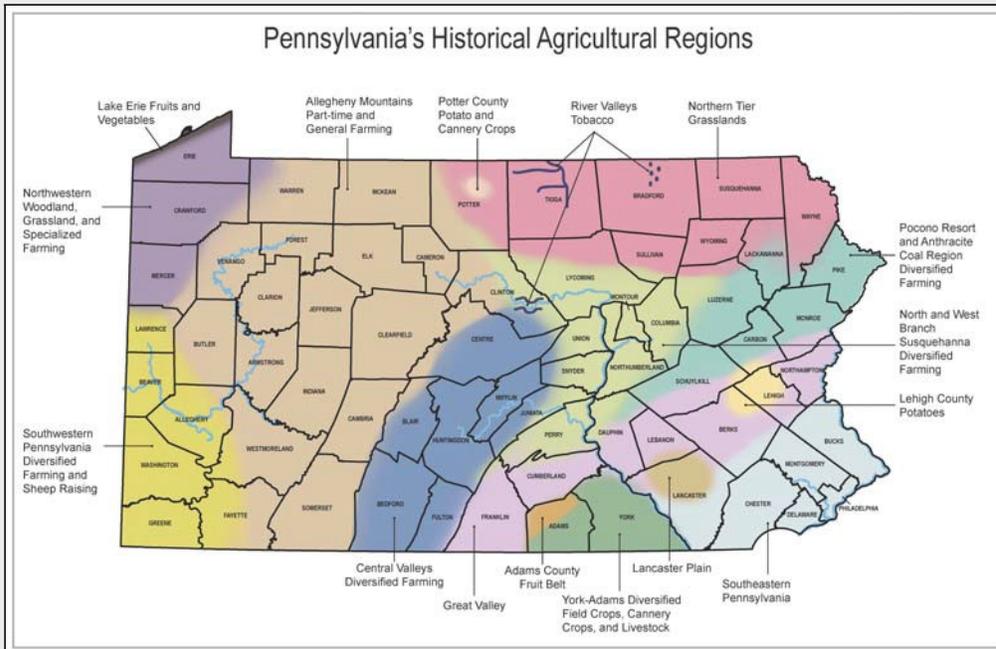
The idea of a “farming system” opens the way to a more comprehensive and accurate interpretation of the historic rural Pennsylvania landscape. For example, because the notion of a “farming system” includes land tenure and mechanization levels, we can identify a distinctive region in the heart of the 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

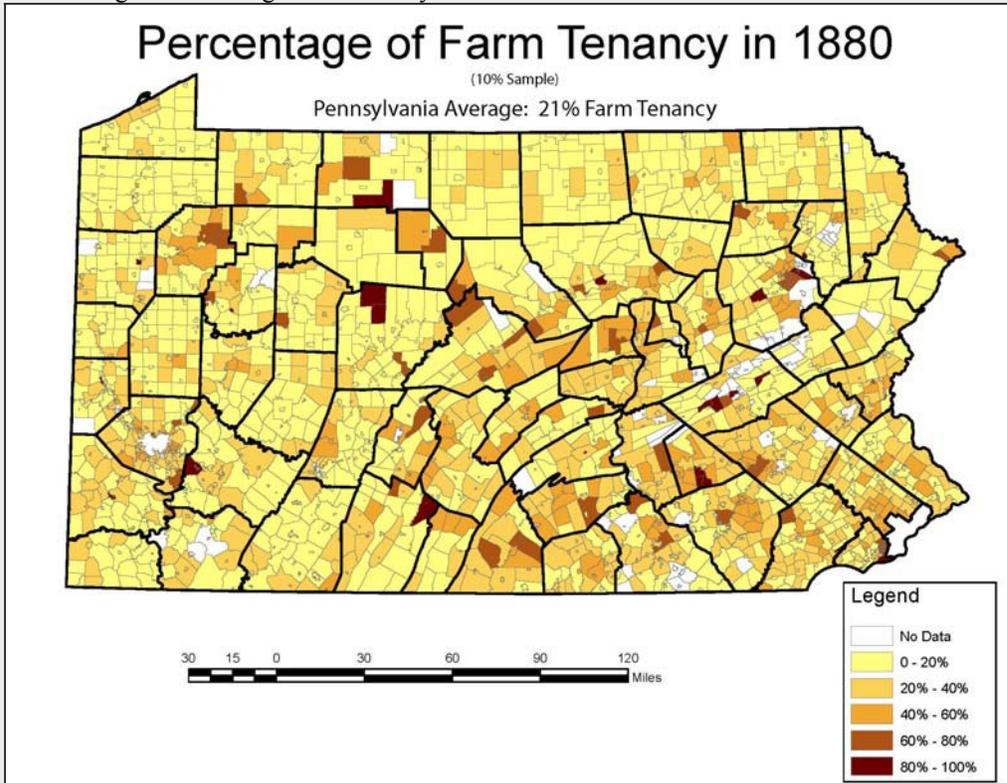
Mapping done by agricultural economists in the early 20th century identified “Types of Farming” areas based on soil types, topography, markets, climate, and production. These helped to establish clear regional boundaries to the extent that topography, climate, and soil types set basic conditions for agriculture, and they also aided in identifying 20<sup>th</sup> 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.



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



Historic Agricultural Regions of Pennsylvania.



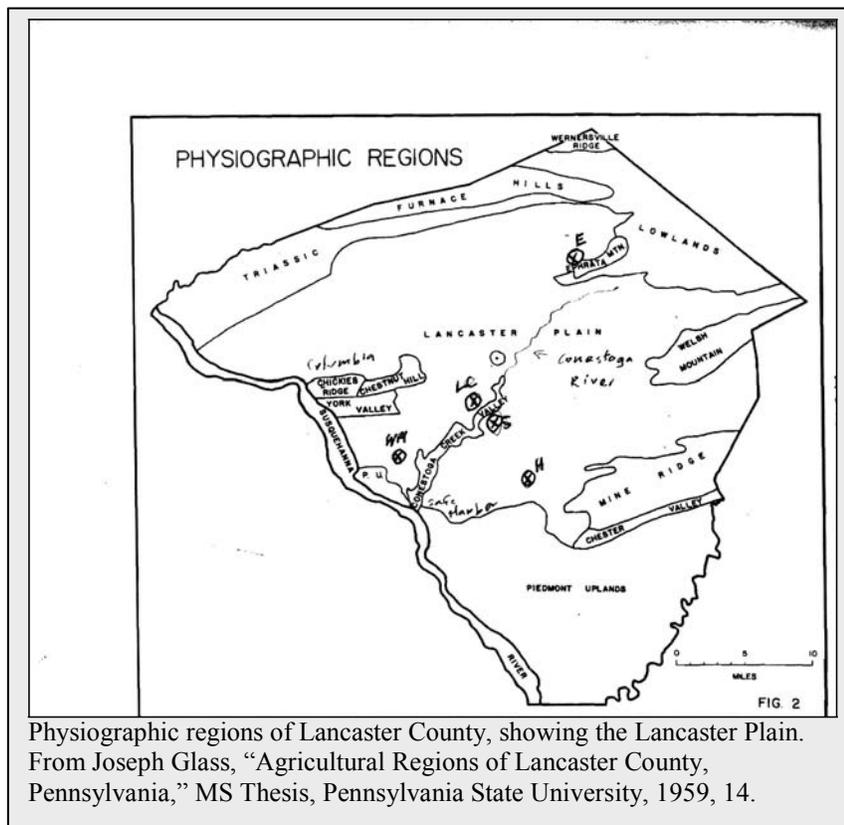
Share Tenants as a percentage of all farmers, 1880.

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 Lancaster Plain is a belt about 20 miles wide (at its widest point) and extending nearly forty miles east-to-west across the northern two-thirds of Lancaster County. It is fairly well defined by natural boundaries: mountain ridges to the north (Furnace Hills), east (Ephrata Mountain and Welsh Mountain), and southeast (Mine Ridge); the Susquehanna River, on its entire western periphery; and the Piedmont Upland, on its south. The city of Lancaster is located within it, as are other towns such as Columbia, Lititz, Ephrata, and Marietta.



Townships which lie entirely or partly in the Lancaster Plain include:

Caernavon	Lancaster	Rapho
Conestoga	Leacock	Salisbury
Earl East	Manheim	Strasbury
Donegal	Manor	Upper Leacock
East Earl	Paradise	Warwick
East Hempfield	Penn	West Earl
East Lampeter	Pequea	West Lampeter

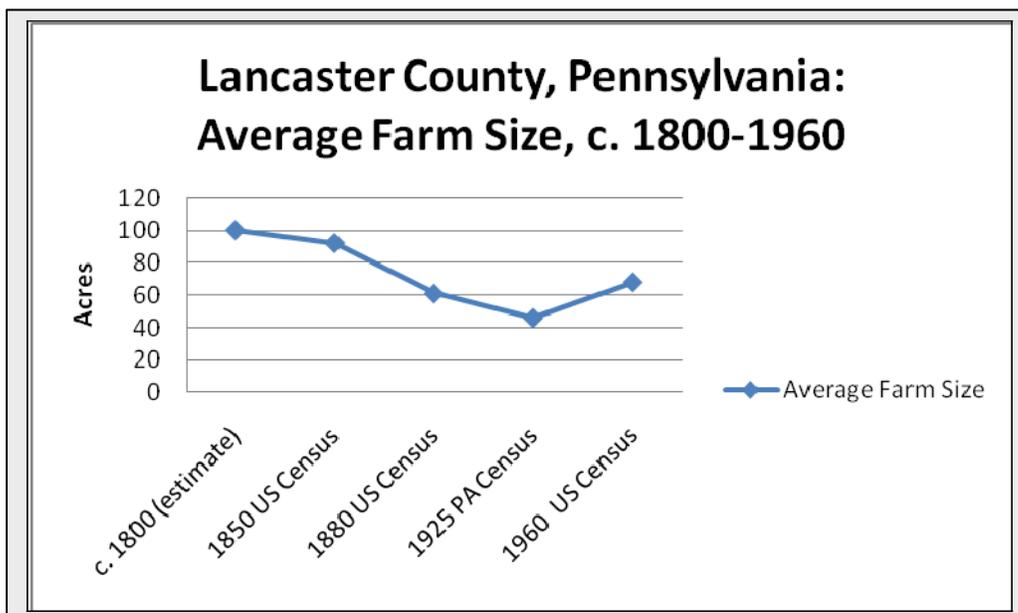
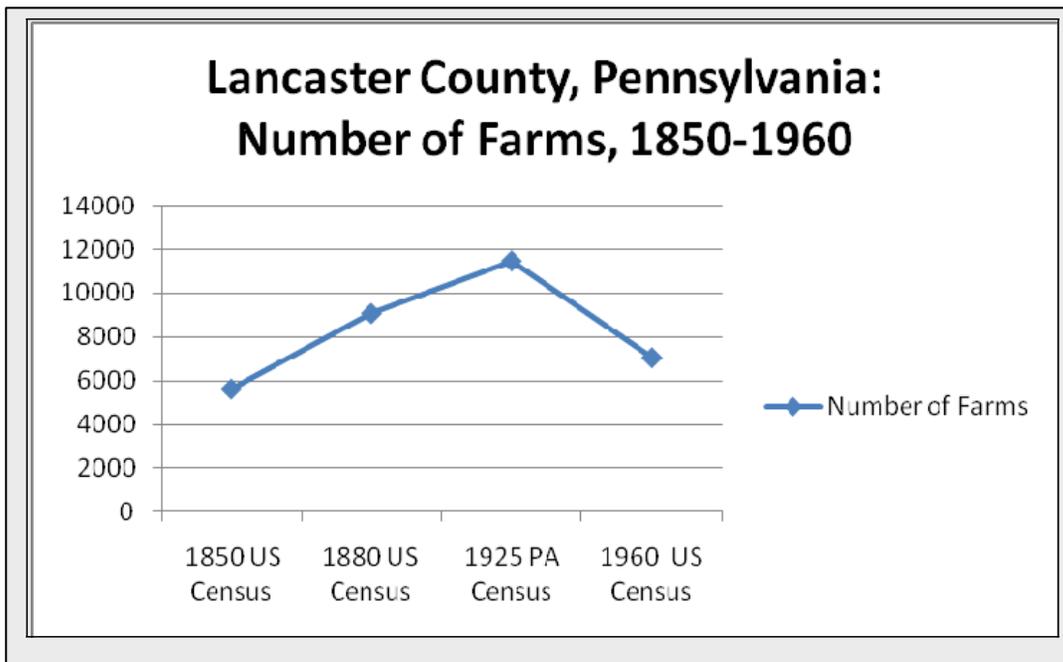
---

## Climate, Soils, and Topography

Lancaster County has some of the best agricultural conditions in the United States. The Plain has a relatively long growing season – 150 to 173 days. Its soils are prime agricultural soils in the Duffield, Edgemont, and Berks series, underlain mainly by limestone parent rock. Rainfall averages about 42 inches. Elevations are from 300 to 500 feet except along the river valleys where they are lower. The principal stream is the Conestoga River. Topography is very gently rolling with most slopes well under 12%.<sup>1</sup>

Overview: This narrative divides Lancaster Plain agricultural history into four broad periods. During the first, from about 1730 to about 1780, Lancaster Plain farm families got established and developed highly diverse production for diverse uses, but mainly focusing on crops. Between the end of the eighteenth century and the end of the Civil War, Lancaster farmers reworked the colonial-era system into a crop-and-livestock regime. Between the Civil War and about 1920, tobacco was introduced into the system, and greater emphasis was placed on poultry and dairy enterprises. Between 1920 and 1960, agricultural competition forced more Lancaster Plain farmers to make adjustments; tobacco declined, while dairy, poultry, and truck farming enterprises rose. Cash inputs increased dramatically and horse farming declined. Overall, Lancaster Plain agriculture remained small scale, highly diversified, and intensive.

Throughout nearly the entire period, farming on the Lancaster Plain was more intensive and mechanized than virtually anywhere in the state. Labor was supplied by family; by bound and later wage laborers; and by tenants, a very numerous group. The Plain Sect presence in agriculture was negligible until well into the twentieth century, and even then Plain Sect farm families were a minority. Culturally, the most notable group was the mainstream Pennsylvania Germans.



---

## Historical Farming Systems

### Diverse Production for Diverse Uses, c. 1730 to about 1780

#### Products, c 1730-1780

This context is more heavily based on secondary sources than other narratives in this series, but primary material still informs the analysis to some extent. Colonial southeastern Pennsylvania has attracted considerable attention from scholars, and a body of secondary work has accumulated which will serve well to identify important agricultural trends for the colonial and revolutionary war period. The literature diverges somewhat in historiographical interpretation, with recent work modifying earlier conclusions.

In addition, a Multiple Property Documentation Form for Lancaster County agriculture was completed in the early 1990s, and appeared in published form in 1994 as *Foundations in a Fertile Soil*, by David Schneider. The present narrative therefore builds on this work, though it differs somewhat in periodization, approach, and findings. The main difference is that this study employs an integrated “farming systems” approach, taking into account labor systems and land tenure as well as production for diverse use rather than focusing on commodity production.

Geographer James T. Lemon’s account of *The Best Poor Man’s Country* (1972) is still the place to begin for analysis of colonial Lancaster County. Lemon’s primary source base was vast, and included contemporary accounts, family papers, tax records, probate records, real estate records, and published materials. His account has held up quite well except for a few points which will be discussed below.

Land purchases were made in 1718 for the area that now includes Lancaster County; Lancaster County was created in 1729. Even then it was sparsely populated except for a few settlements south of the present Lancaster City and Warwick Township, near Lititz. But by about 1760, settlement was well along and the population in southeastern Pennsylvania (Lancaster, Chester, Berks, Bucks, Philadelphia) had exceeded 100,000. The Lancaster Plain, Lemon notes, “contained the richest medley” of immigrant groups, including Huguenots, German Dunkers, Welsh Anglicans, and Mennonites, as well as English, Germans, and Scots Irish people

representing mainstream Protestant denominations. Over time, it became more heavily German-speaking; Lemon estimates that by about 1780, two-thirds of the entire county's population was German-speaking. In 1754 Governor Pownall described the land around Pequea: "a rich landscape – farms surrounded with apple and pear trees. The farmers, proprietors, not tenants. On every farm a lime kiln, and the land adapted for the best kind of wheat. On inquiry, the finest farms are all owned by Switzers."<sup>2</sup>

By about 1740, agriculture in the Lancaster Plain was taking shape amid constant flux in population movement and makeup, land tenure arrangements, and economic development. Land prices rose, and the average size of land holdings dropped between 1730 and 1760. The tenant class grew, to about a third of taxables.

Farming in southeastern Pennsylvania was conducted along the lines of what Lemon calls "general mixed farming and extensive use of the land." He wrote: "Farmers used their land to produce a wide range of crops and livestock for home use and for sale." By "extensive," Lemon meant that land was cropped "superficially," without high inputs of fertilizer and sophisticated techniques. Fallow land, woodlot, and meadow (hay lands, often cut from whatever plants took root without deliberate seeding) took up a relatively large proportion of land. Soil was "rested" through fallows. Livestock were few. Orchard, cropland, and gardens took more attention.<sup>3</sup>

Historians have often connected extensive farming with self-sufficing or non-market agriculture. However, colonial Pennsylvania's farms were rarely as self-sufficient as period observers such as Hector St. John de Crevecoeur claimed. Indeed, the often-made distinction between subsistence and market farming does not work well at all in the colonial Pennsylvania context. From the start, Pennsylvania farming families participated in the global commodities trade, sending products across the Atlantic and to the Caribbean. Around 1730, historian Brooke Hunter notes, population growth, war, and crop failures in Europe stimulated an "explosive growth in demand" for grain, and Pennsylvania farmers were well positioned to respond. They raised grain to sell to Philadelphia millers, who in turn exported flour. The burgeoning West Indies plantation economy soaked up all sorts of provisions including flour and meat. Pennsylvania-produced foodstuffs were also sent along the coastwise trade from New England to the Carolinas. A road connected Lancaster to Philadelphia as early as 1733, so it is clear that Lancaster farmers contributed agricultural products to those sent out from Philadelphia. The famed Conestoga draft horse and Conestoga wagon originated in Lancaster County.<sup>4</sup> Although the wheat crop has received the most attention, market strategies were highly diversified. Lemon noted a variety of farm products, evidence for which appeared in wills,

journals, travelers' accounts, and other sources. Crops included wheat, rye, barley, oats, buckwheat, Indian corn, potatoes, turnips, cabbage, apples, peaches, cherries, flax, flax seed, hemp (for which the township of Hempfield was named), and hay. Pork, beef, mutton, eggs, wool, and butter were typical animal products. Fruit and grain were processed into cider and liquor. Farmers raised and sold cattle, sheep, swine, horses, poultry, and bees.<sup>5</sup> They gathered nuts and berries, and made maple sugar from their woodlots. The Lancaster County MPDF mentions spelt as an early grain (citing 19<sup>th</sup> century county histories), and foodways writers also frequently mention this European grain, but standard histories do not mention it at all.<sup>6</sup>

Michael Kennedy, in a well-researched 2000 article, has modified some of Lemon's arguments about local markets in colonial Pennsylvania. Lemon, as a historical geographer, assumed that central places (i.e. towns) were necessary to the creation of local markets for farm produce; he was preoccupied with testing von Thünen's famous hypothesis about how distance from a central place determines the nature of agricultural production. Because of this perspective, Lemon's work left unanswered questions. There were few such population centers in mid 18<sup>th</sup> century Pennsylvania; indeed, Lemon himself noted that the colonists preferred dispersed settlement. At the same time, the percentage of non-farmers – i.e. consumers -- was growing, and clearly farmers were marketing products. So, where did they sell their wares if not in towns? Kennedy has solved this puzzle convincingly; he shows that the central place function was served not by towns but by stores located at ironworks and mills. These stores were liberally and widely distributed, and virtually every southeastern Pennsylvania household was situated near at least one. Kennedy explains not only where the markets were located physically, but also links them to the growing population of landless consumers.

Kennedy also adds to the list of products marketed. Beans, onions, wood, veal, parsnips, venison, cucumbers, molasses, greens, peas, leather, limestone, tallow, wax, straw, hops, hides, and feathers were raw farm products mentioned in mill and ironwork store records. Others included processed items such as stockings, clothing, linen, baskets, soap, thread, cheese, vinegar, shingles, charcoal, and candles. In all, Kennedy enumerated 118 different farm products traded at these outlets. Kennedy concludes that "many more Pennsylvanians produced more crops for markets than previously assumed." His work is persuasive because, unlike Lemon, he is able to document actual sales rather than needing to rely on extrapolation as Lemon often did. Kennedy also makes other important observations. His estimate for average farm acreage is significantly lower than Lemon's (88 vs. about 125 across the region); and he contends that given their limited space, a typical farm family would have less diversified production than Lemon assumed. In other words, all Lancaster Plain farms were diversified, but they didn't all produce the same mix. It was the collective total that created the overall diversification.<sup>7</sup>

For understanding the landscape, it is important to keep in mind Kennedy's observation that even though colonial Pennsylvania farms collectively produced an astonishing variety of items, typically on an individual farm agriculture took place on a quite modest scale. Arthur Lord's work is consistent with Kennedy's. Lord used Lancaster County tax records to estimate that in the mid 18<sup>th</sup> century, only about 40 acres of a typical farm in Lancaster County was cleared, out of a total acreage of 135.<sup>8</sup> Of the cleared acreage, only about 9-10 acres were sown in grain, and in those fields, wheat shared space with oats, rye, barley, and buckwheat. Meadow provided hay, and most farms had fallow land, pasture, gardens, orchards, and woodlot. Animals were few in number (2.6 horses, 4.5 cattle, and 5 sheep on average), and they often grazed in woodland. Just enough were kept as could be fed through the winter. Indeed, Lord found that the average number of cattle listed in Lancaster County tax records actually was smaller in 1772 than in 1758.

When Lancaster County is under discussion, inevitably the question arises about whether cultural background influenced agriculture. More precisely, were Germans truly more knowledgeable about land choices (taking up the good limestone land) and more careful about agricultural practices than were their "English" or "Scots-Irish" neighbors? Over the years, countless local histories and advertising blurbs have played infinite variations on this motif.<sup>9</sup> Of course, this is not only because contemporary observers voiced definite opinions about whether the Germans were good or bad farmers; it is also because an image of thrifty, productive Pennsylvania German farms has exerted a long-standing hold over popular notions of Lancaster County. This image was cultivated not only by mainstream Pennsylvania Germans, but also by twentieth-century tourism promoters who commodified Amish culture (a tiny subgroup) and conflated it with Pennsylvania German culture more generally. The whole question has become laden with preconceptions, ethnic pride, and romantic overlay.<sup>10</sup>

James Lemon and Arthur C. Lord have addressed the issue for the colonial period. (Others have tackled it for the revolutionary and early national period, and they will be discussed later.) Lemon argued strenuously that there was no correlation between agricultural practices and national origin in the colonial period. Some histories made a link between European practices and German farming in the New World, arguing that because people from Germany knew about rotations and stall feeding, that they must have brought those practices here and used them on the Lancaster Plain. But Lemon noted that initially, people from all groups abandoned European-style nucleated settlements and adopted New World crops like maize, not to mention an "extensive" agriculture. He found no evidence that German farms were either more productive or different in their crop mix from English farms. Lord thought that Germans

perhaps favored cattle and English people sheep, but beyond that he was forced to admit that “a greater difference was expected between the Anglo and Germanic farmers than was found in the data.” For the colonial period at least, the weight of evidence seems to be against substantial ethnic differences in agricultural practices. Circumstances differed too much from settled European circumstances in these early years for farmers to be able to invest in European-style labor intensive agriculture.<sup>11</sup>

### **Labor and Land Tenure, 1730-1780**

For most of the eighteenth century, agrarian families applied their energies to the basic tasks of making a farm: clearing, plowing, fencing, and planting. Farm labor was overwhelmingly performed by hand, and many workers were needed. Farm workers were typically “bound” or “unfree” in some way: some were family members, and others were un-free redemptioners, indentured servants, cottager tenants, or (infrequently) slaves. Women contributed significantly to the agricultural economy. Michael Kennedy persuasively documents that women performed a very large portion of agricultural labor, not only in tasks traditionally allocated to women (spinning, dairying, needlework) but field work as well.<sup>12</sup> So it appears that there was no hard and fast gender division of labor.

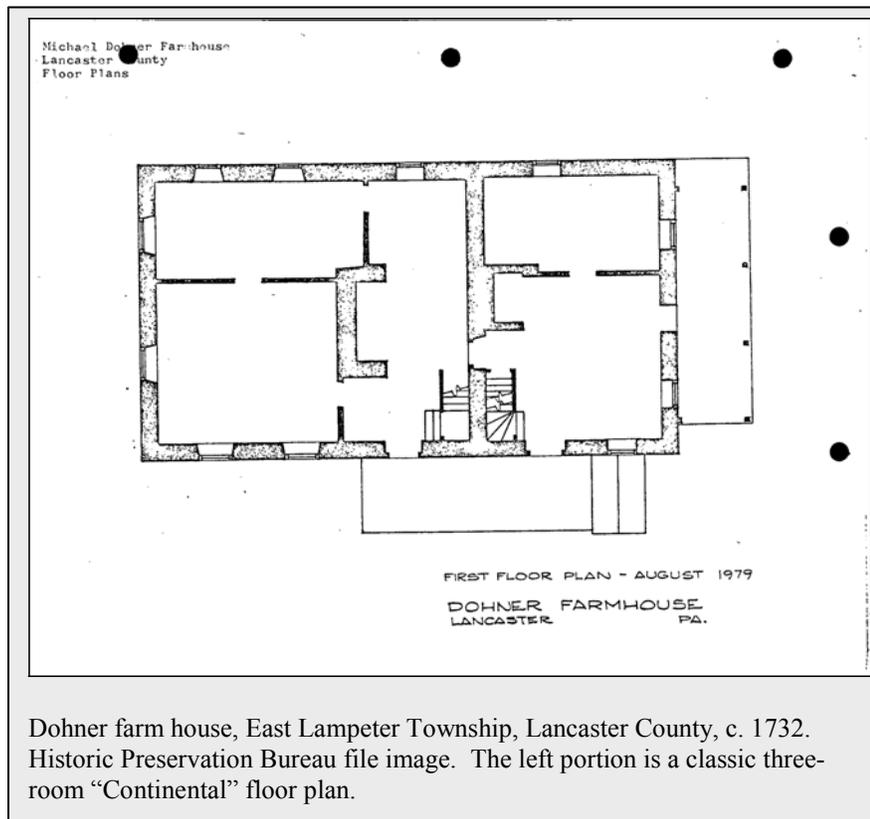
Tenancy was a pervasive institution in southeastern Pennsylvania during the colonial period. Lemon estimated that “... in 1760 and 1782 about thirty percent of Lancaster’s and Chester’s married taxpayers were landless, and about the same number of farmers fell into the tenant category, possibly half of them sharecroppers.” These figures pertain only to taxables, not representing even all household heads.<sup>13</sup> Access to land was far from broad.

A nineteenth-century county history described one sort of tenancy arrangement. The author noted that many redemptioners “seemed to claim a kind of patronage from their masters, and usually contrived to get a small house with a garden and potato patch. Their rent was so many days’ work in harvest, or other farmer’s work: many of them were tradesmen – weavers, shoemakers; and were paid for their work in grain, &c. Harvest wages were half a bushel of wheat; raising grain was not the principal object with the farmers, for there was not a market for it: hops and hemp were the sources of profit. Many of these persons were Germans...”<sup>14</sup>

## Buildings and Landscapes, 1730-1780

### *Farm House, 1730-1780*

As late as 1798, poorly lighted one story log buildings, typically measuring 30 by 24 feet, made up three-quarters of the county's housing stock. We may therefore be reasonably confident that the typical mid 18<sup>th</sup> century house was at least as small and primitive.<sup>15</sup> These modest dwellings have all but vanished from the landscape, leaving much grander and less representative extant buildings. Among these the three-room "Continental" house has received the most attention from scholars, though other types were built and do survive. Here the discussion focuses mainly on these houses as agriculturally productive spaces; their cultural and architectural significance is very well covered in other places.



Surviving “Continental” houses share some distinguishing features: the central roof-ridge chimney, asymmetrically arranged openings, steep roof pitch, banked construction, and three- or four-room interior plan. The main entrance led to the “küche” or kitchen, a long narrow room with a large walk-in hearth; another door led out the other end. In the adjoining “stube” or stove room, a five-plate stove backed up onto the hearth wall and was vented out the central chimney. Behind the “stube” an unheated “kammer” served as the primary bedroom. Few buildings were ethnically ‘pure’ in the Pennsylvania context; the Frederick White House, for example, has both “Germanic” and “Huguenot” characteristics.<sup>16</sup>

These imposing early and mid 18<sup>th</sup> century buildings served multiple agricultural purposes. Many had attic granaries where the most valuable farm product was stored before marketing.<sup>17</sup> The attic could also be organized to provide a smoke chamber -- an enclosed space surrounding an outlet built into the chimney where smoke could be released to cure meat. Moving downward, many productive activities took place in the “küche” or kitchen, especially food preservation. Finally, another major productive space often found in large Lancaster County houses of the period was the vaulted cellar. This large underground space afforded ample facilities for cool storage and dairy processing.



Vaulted cellar, Benedict Eshleman House (I), Conestoga Township, Lancaster County, 1759.

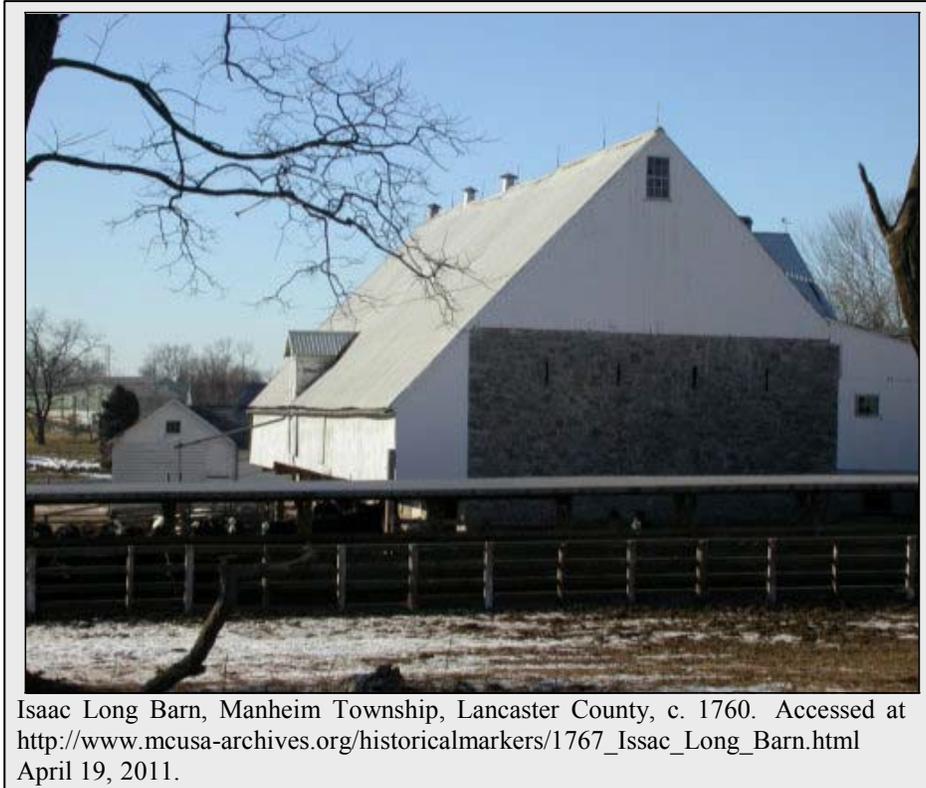
*Ancillary houses, 1730-1780*

The 1798 Direct Tax records list many small log tenant houses on properties that also had larger houses. For example, in Conestoga Township, Conrad Brown lived in an 18 by 20 log house on property owned by Henry Dietrich. Dietrich, the landlord, owned 199 acres and lived in a two story limestone house with 12 lights worth \$650. While we can't assume that the identical buildings were present fifty years earlier, secondary research confirms that tenant housing was often provided, and that there was a hierarchy. It is difficult to confirm any extant tenant houses in the Lancaster Plain from this period.

*Barns, 1730-1780*

Since oxen and cattle could subsist on hay stacked outdoors and by grazing, few farmers needed much storage space for fodder. Small corn cribs and occasionally granaries accommodated the crops.<sup>18</sup> The need for centralized barn space was minimal. Even as late as 1798, a third of Hempfield Township men explicitly identified as "farmers" lacked barns. Most barns were log, and most were small to moderate in size, roughly 300 to 1000 square feet.<sup>19</sup> Roofs were sometimes thatched. Typical Pre-Revolutionary barn forms were relatively simple. One type, the "Grundscheier," or ground barn, was a tripartite, ground-level barn with stable, threshing floor, and mow arranged crosswise to the roof ridge, and with access gained through eaves-side doors. These were made of log, frame, or stone. Nicholas Hollinger Barn in Conoy Township, c 1779, is one example.<sup>20</sup>

The distinguished student of the Pennsylvania Barn, Robert Ensminger, has suggested that the classic "Sweitzer" barn form (a two-level banked barn, recognized by its asymmetrical gable-end profile with the projecting forebay) was first developed in the Conestoga region on the Lancaster Plain; some of the earliest extant examples, one dating to 1739 (the Herman barn, a log Sweitzer), and 1754 (the Isaac Long barn), are located there. These barns anticipated developments to come and the type will be discussed more fully in the next section.



Isaac Long Barn, Manheim Township, Lancaster County, c. 1760. Accessed at [http://www.mcusa-archives.org/historicalmarkers/1767\\_Issac\\_Long\\_Barn.html](http://www.mcusa-archives.org/historicalmarkers/1767_Issac_Long_Barn.html) April 19, 2011.

### *Outbuildings, c 1730-1780*

Few outbuildings have been definitely documented to this period. There is a combination smokehouse/summer kitchen c 1780 on the Haldeman property, described in Historic Preservation Bureau files at URL [http://www.arch.state.pa.us/pdfs/H001083\\_01B.pdf](http://www.arch.state.pa.us/pdfs/H001083_01B.pdf).

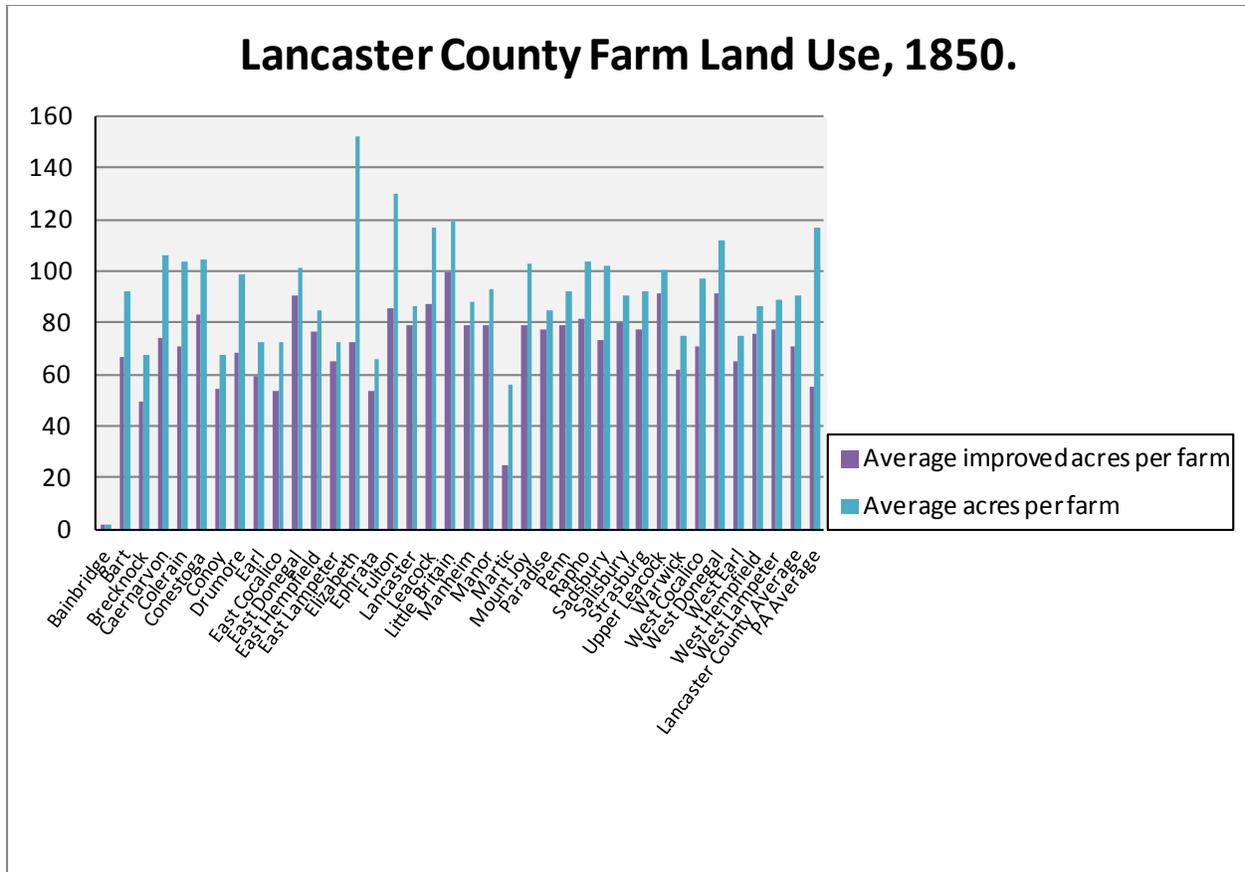
### **Landscape Features, c 1730-1780**

Few colonial landscape features will have survived. Documentary evidence (such as travelers' accounts or advertisements) suggest that Lancaster Plain farms had a patchwork of small crop fields; meadow; pasture; fallow land; woodlot; and sometimes irrigated plots as well. Irrigation was mentioned more than once in historical sources and in numerous real estate advertisements. A "Swiss" farm between Lancaster and Wright's ferry had irrigation works described thus: the method of watering meadows by cutting troughs in the side of the hill for the springs to run in. – the water would run over the sides and water the whole of the ground."<sup>21</sup> Real estate ads commonly touted "well watered meadows" and noted that more could be "made," thus emphasizing that these fields were created, not natural.<sup>22</sup>

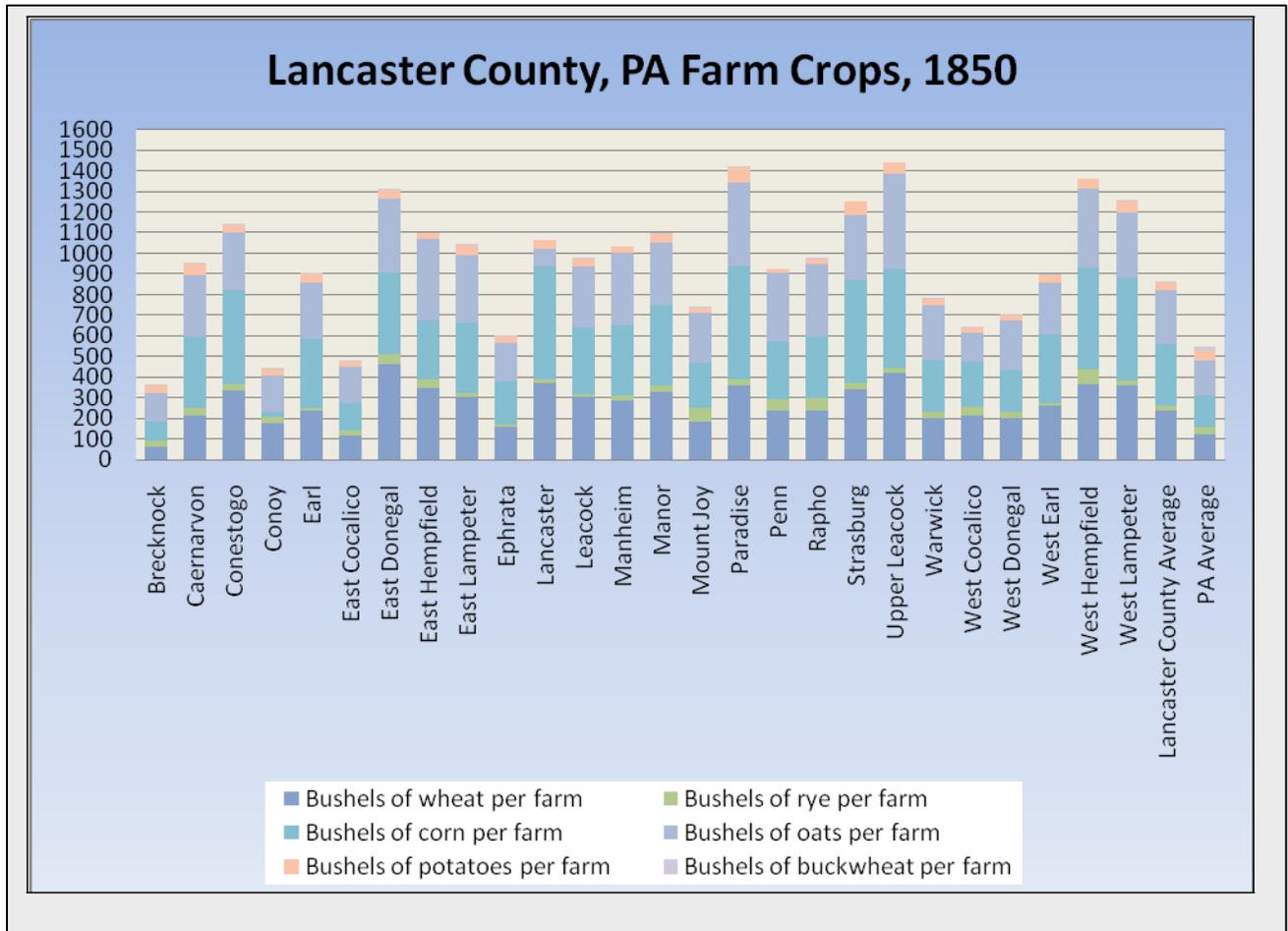
## **Diversified Production, Intensification, and Livestock Raising, c. 1780-1865**

### **Products, c. 1780-1865**

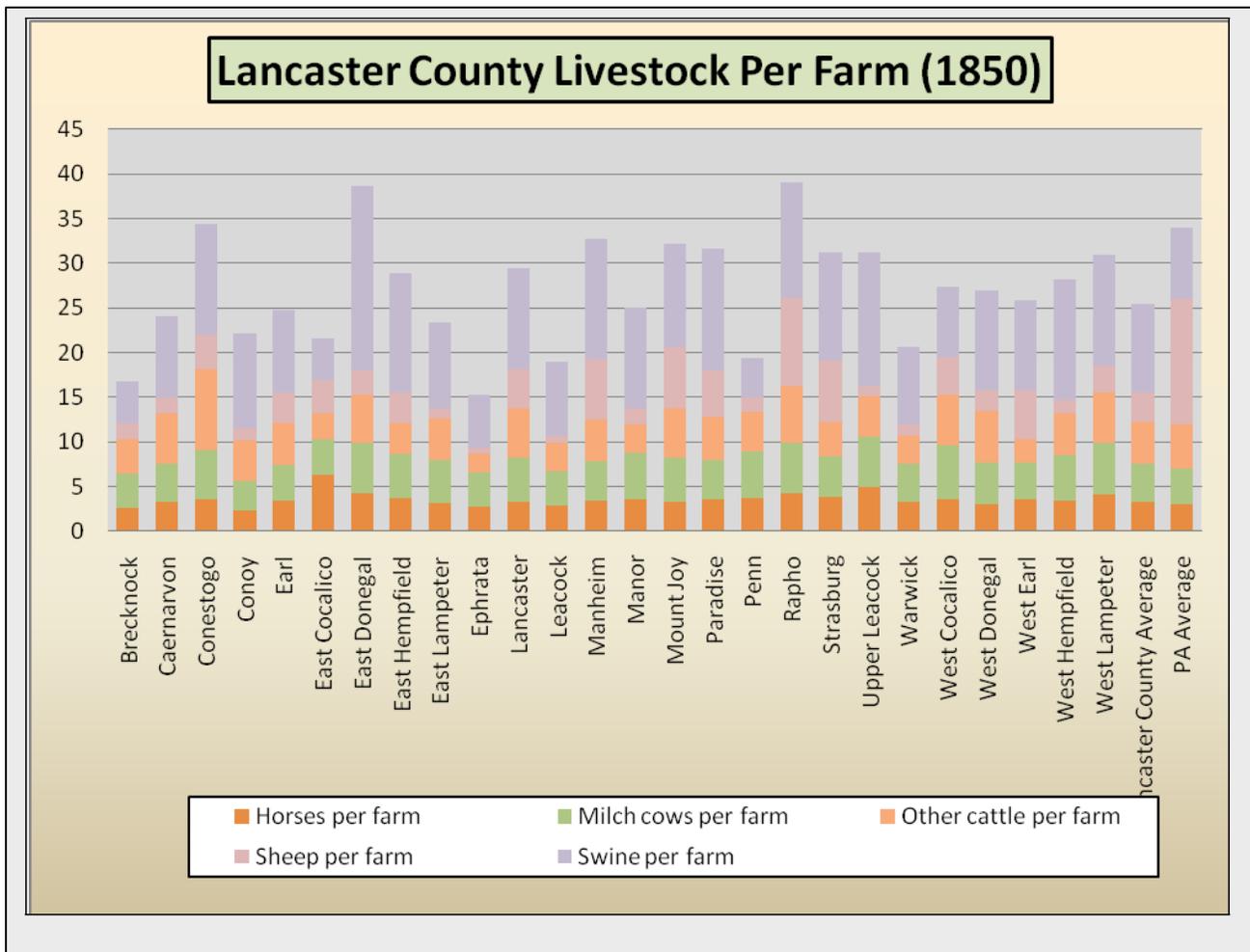
Farm land use, 1850. Lancaster County had far more improved acres, but fewer acres overall, than the average Pennsylvania farm. Hay acreage may be overstated because yields were probably higher in Lancaster County. For a list of townships in the Lancaster Plain, please refer to the section on “Location.”



Farm land use, 1850. Lancaster County had far more improved acres, but fewer acres overall, than the average Pennsylvania farm. Hay acreage may be overstated because yields were probably higher in Lancaster County. For a list of townships in the Lancaster Plain, please refer to the section on "Location."



Lancaster County Farm Crops, 1850. Smaller Lancaster County farms raised far more crops than the average Pennsylvania farm. For a list of townships in the Lancaster Plain, please refer to the section on “Location.”



Lancaster County Farm Livestock, 1850. Overall livestock numbers were smaller than on the average Pennsylvania farm. This is because sheep were so common elsewhere; if they are omitted, average Lancaster County animal numbers are higher than for the state as a whole. For a list of townships in the Lancaster Plain, please refer to the section on “Location.”

After independence and into the 19<sup>th</sup> century, the region’s agricultural production began to shift away from the system Lemon described. The essential change was a shift from an extensive, mainly crop-based system to a more intensive crop-and-livestock system. Intensive crop farming in this instance meant rotations, with less or no fallow land, use of clover and lime, and continual replenishment with manure in a continual, self-renewing cycle. The precise timing and nature of this shift are very difficult to ascertain, for local tax assessment records ceased systematically to collect agricultural data late in the 18<sup>th</sup> century, and the federal government did not begin its agricultural census effort until 1840. So there is a half-century gap in quantitative data. The

available qualitative documentation is ambiguous for the late 18<sup>th</sup> century, but there is more plentiful and less equivocal data showing that farming systems had indeed changed by about 1840.<sup>23</sup>

A few Lancaster County farmers were probably turning to intensive crop and livestock husbandry in the late eighteenth century, but available evidence suggests that the practice was not yet widespread.<sup>24</sup> Assessed livestock numbers actually fell from the 1750s to the 1780s. For a time, other options were probably more attractive. After the Revolutionary War, a resurgent demand for wheat, flour, and other foodstuffs stimulated Pennsylvania production for export, into the first decade of the new century. Since Lancaster Plain conditions lent themselves so well to crop production, farmers must have felt a strong compulsion to keep on growing wheat and corn crops while overseas demand for grain was so strong.

Yet other forces in the late eighteenth and early nineteenth centuries were combining to force farmers to reorganize agricultural production and methods. The infamous Hessian fly invaded southeastern Pennsylvania in the 1790s and caused widespread devastation, prompting farmers to reconsider their overreliance on wheat. In 1807, Thomas Jefferson's Embargo delivered another blow to grain producers. The Panic of 1819 and ensuing depression also forced readjustments. Land prices in the county plummeted for a time.<sup>25</sup> Some histories mention problems with soil exhaustion. Though painful, these disruptions were eventually overcome, because the much anticipated "home market" was becoming a reality, as the nonagricultural population in the young republic expanded. The emergence of nearby urban centers and the general affluence of American consumers helped to turn farmers' attention to producing meat, as well as bulky items that could be marketed locally. Thus hay, livestock for meat, and dairy products became attractive. An important artery leading to Philadelphia, the Lancaster Pike, was finished in 1794 and this stimulated new agricultural productions.<sup>26</sup> The Lancaster Plain soon was laced with roads and eventually with railroads, and was ideally positioned to participate fully in this economic development.

A telling account of how the Hessian fly forced changes came from a "Lancaster County Farmer" writing from Salisbury, Pennsylvania to the *American Farmer* in 1820. He described the devastation not only of wheat, but of barley crops in Lancaster County beginning in 1789, and how anxious it made farmers, because "the farmers of Lancaster County, chiefly depended upon their wheat crops as their staple at that time.... grazing not being practiced among us, were the more concerned how we should make our farms profitable."<sup>27</sup> His solution was to plant later, so that frost would kill some of the insects, but also to institute a "rotation of crops" in which Indian corn, barley, wheat, rye, and clover were rotated and treated with barn yard manure; he

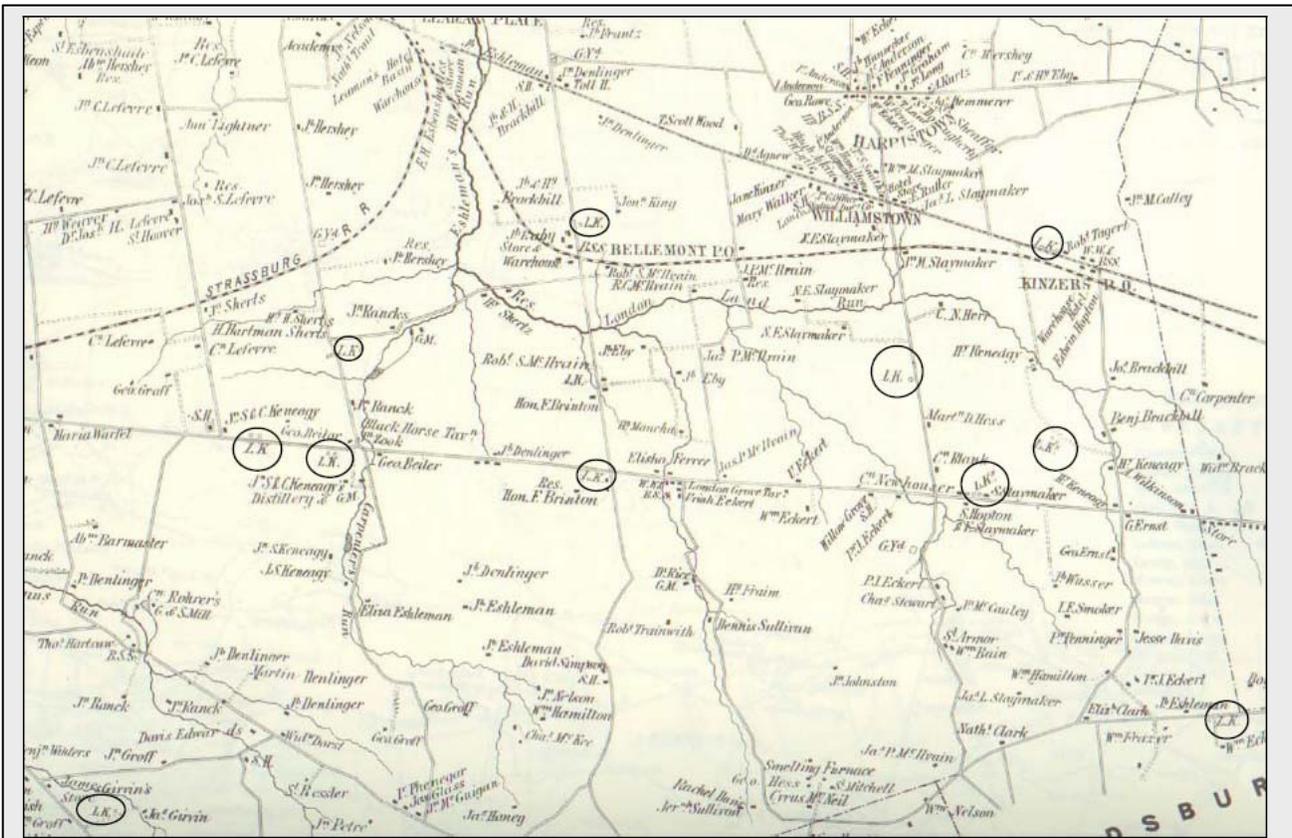
“also commenced raising sheep and grazing cattle...” He concluded proudly: “the Hessian fly, instead of being a curse, has had the contrary effect; my land is now in as productive a state as I can desire...”

The 1842 *Farmer's Register* described a very similar “cropping system” in southeastern Pennsylvania: farmers “plough a sod field, in the fall or spring, for corn, which is cut up at the ground, following crop oats or barley, then manured and put into wheat; after which it is put down to grass, generally clover, without and with timothy...” The observer added: “this system is the most laborious, hence it is uniformly adopted by the German farmers, on our best lands.” The article also noted that many farmers practiced what he called “mixed” farming, combining grass and livestock production. The same article described how cattle from Greene and Mercer Counties (in western Pennsylvania) were being driven east and “sold in Lancaster and Chester counties, to be fed off.” In 1846, another author noted that “Lancaster, York, and Dauphin are fast following the example of Chester” in fattening beef animals; this writer attributed the trend to the decline in distilling, declaring that most Lancaster County distilleries were now “defunct.” It seems that temperance was yet another factor in agricultural change.<sup>28</sup> An 1846 report to the U. S. Patent Office (precursor to the USDA) agreed: there is “a growing enterprise in raising cattle and preparing them for market, owing to the fact that by the cessation of many distilleries, the grain which was so consumed is now converted into food for stock.”

Cattle feeding was just one component of a system that was diverse and complex. Swine, for example, were quite important; by 1850 several Lancaster Plain townships averaged more than fifteen hogs per farm. Cattle, hogs, and horses complemented a very productive cropping system. As before, an immense variety of crops and products came off of Lancaster County farms. It is important to note that Lancaster was a top farming county in a state that in 1850 still was the nation's top wheat and rye producer: the county was first in Pennsylvania clover seed production, and second in oats, potatoes, hay, and buckwheat. The shift in farming meant that instead of forming the primary basis of agricultural production, grains and hay were now integrated into a crop and livestock system.

While beef stall feeding commanded the greatest attention, butter dairying also claimed a place on the Lancaster Plain farm. In several Lancaster Plain townships (Leacock for example) butter production was well above state averages. Women there made over 700 pounds of butter on average in 1850. Most of this product would have gone to market.

Lime was another important farm “product” on the Lancaster Plain. A farmer from Pequea writes to the *American Farmer* in 1823 that “every farmer is anxious to get a lime-kiln built... observing that they have too long been putting their farms in their pockets.” Lime (calcium oxide) is made by burning limestone (calcium carbonate) in a lime kiln, commonly distributed along major roadways. Wood (later coal) was used for fuel. By 1864 the county atlas shows numerous lime kilns. Lime figures in agricultural histories as an important early dressing for fields where soil acidity was too high. As well, it worked in conjunction with clover to produce high quality hay. However, generally Lancaster Plain soils have low lime requirements.<sup>29</sup> We should consider lime more broadly. Lime was a key ingredient in mortar, plaster, and whitewash. It was also used as a disinfectant in outdoor privies. Given its many uses, lime could generate income. Alan G. Keyser and Frederick Weiser write: “lime sometimes had to be hauled great distances to meet the needs of persons who lacked it on their property.”<sup>30</sup>



Paradise Township, 1864, showing lime kiln locations. The road bisecting the image from left to right is present day Route 30. Bridgens' Atlas of Lancaster County Pennsylvania (Lancaster, PA: D. S. Bare, 1864), 32. Lime kilns were situated right along the road so that the bulky and heavy product could be easily shipped out.

Improved land accounted for a disproportionately high amount of Lancaster County's nineteenth century farmlands. Seventy-seven percent of a typical 1850 Lancaster County farm was improved, which the Census defined as land "cleared and used for grazing, grass or tillage, or which is now fallow."<sup>31</sup> Lancaster County ranked twelfth in the state in this category in 1850, and by 1860 it was sixth. Wood land was correspondingly scarce. Farms were smaller than in the eighteenth century, and they were smaller than the contemporary Pennsylvania average (92 vs. 117 total acres in 1850). However, per-farm total crop production far exceeded statewide averages for corn, oats, wheat, and hay. Land productivity (that is, production per improved acre) was also higher: overall the average Lancaster County farm in 1850 produced more grain crops per improved acre than in Pennsylvania generally – about 12 bushels to 10 for the average Pennsylvania farm.

Many histories connect this high productivity to superior farming methods, but it is just as likely that it was due to naturally superior soil productivity. We know from modern soil surveys that Lancaster Plain soils are naturally more productive than most other Pennsylvania soils; indeed, the "index of relative productivity" places other Pennsylvania soils between 50 and 80 in relation to the Lancaster Plain's 100, depending on the crop and location. While the new "dunghill doctrines" likely resulted in *maintaining* soil fertility and productivity, there is insufficient evidence (despite claims to the contrary) to conclude that productivity was actually *improving* on a long-term basis. Absolute production was increasing significantly, because land was still being cleared; but in general, productivity (i.e. per-acre production) was probably static.<sup>32</sup>

Because such a high percentage of land was in crops, and because the land was so naturally fertile on the Lancaster Plain, some townships' crop production was double the state average. Upper Leacock, Paradise, and East Donegal farms averaged well over 1400 total bushels per farm (including corn, wheat, oats, rye, buckwheat, barley, and potatoes), while the average Pennsylvania farm produced around 500 total bushels. This doesn't count hay production, which also was well above average in Lancaster County, at seventeen tons per farm annually. Other products added to this diversity. With the new emphasis on rotation and clover, clover seed came into demand. A contributor to the *American Farmer* in 1820 described the "Pennsylvania mode of getting out clover seed," declaring that Chester and Lancaster Counties were "two of the first counties that became eminent in the culture of clover in the State of Pennsylvania." One "German farmer" he saw at market in Philadelphia was selling no less than 71 bushels of seed.<sup>33</sup> Turnips, flax, flax seed, honey, beeswax, and hams were other articles produced for markets. As before, families grew and processed many orchard fruits, especially apples; and tended extensive gardens.<sup>34</sup>

**Labor and Land Tenure, c. 1780-1865**

Family still supplied the most labor. This meant everyone; observers continued to note that women and girls worked in the fields.<sup>35</sup> About the same time, the transition from bound to free labor was completed. Wage workers, hired in an open labor market, were more in evidence. These extra farmhands helped provide the labor that enabled farmers to put more of their acreage into production. In Lancaster County, male farm hands could command \$10-15 a month and board except during harvest and haying time, when they made a dollar a day. Female “domestics” made only \$ 4 per month.<sup>36</sup> Farm tenancy continued to be common, though no hard quantitative figures are available before 1880.

Because Lancaster Plain farming was so intensive, mechanization levels were very high. In 1850 the average Lancaster County farm had \$171 worth of implements, as compared with Pennsylvania at \$113, on much larger farms.<sup>37</sup>

**Buildings and Landscapes, c 1780-1865***Farm House, c 1780-1865*

Farmhouse, East Hempfield Township, Lancaster County, mid 19th century. Pennsylvania Historic Preservation Bureau file photo.



Two-door farm house, East Lampeter Township, Lancaster County, 1854. Pennsylvania Historic Preservation Bureau file photo.



Three-level, two-door house, Pequea Township, Lancaster County, 1849. Pennsylvania Historic Preservation Bureau file photo.

Many more Lancaster Plain farm houses survive from the first half of the nineteenth century. Even taking into account that surviving buildings usually represent wealthier families, these houses illustrate the region's prosperity. The Federal and Georgian styles are well-represented; they typically had symmetrical facades, often five bays with a central doorway. By the late nineteenth century Italianate and Victorian Gothic ornament were appearing in the county.<sup>38</sup>

The four-bay house, often with two doors, was popular for a time. This type has uncertain origins; the most thorough work so far has concluded that in York County, it represents Pennsylvania German cultural accommodation in the sense that it blended elements of "English" and "German" cultural repertoires. It does seem clear that the form was most popular in German Pennsylvania during the entire nineteenth century.

The examples included above from the Historic Preservation Bureau files illustrate how Lancaster Plain farm families made variations on the basic form. The Musser and Bassler Landis houses are both substantial brick double-pile, two-story houses with end chimneys. The Haverstick House continues the earlier custom of devoting significant space to productive areas, in this case a full basement kitchen. Numerous documented examples from the nineteenth century also had vaulted cellar storage rooms, reflecting not only an enlarged subsistence sector but probably also enhanced home dairy production for market.<sup>39</sup>



Farm house, Conestoga Township, Lancaster County, mid to late 19th century. Pennsylvania Historic Preservation Bureau file photo.

*Tenant House, c 1780-1865*

Since tenancy was so prevalent, there must have been a good many farm tenant houses. Documentary efforts haven't really focused on tenancy, so we don't know much about this. However, it is quite likely that many smaller houses probably served tenants, and that many farms had more than one house. Nineteenth-century real estate ads for farms usually mentioned tenant houses. The Historic Preservation Bureau files note several enclaves with groups of very similar small rural houses that could conceivably have served as tenant quarters.<sup>40</sup>

*Barns, c 1780-1865*

During this period, the Pennsylvania Barn became ubiquitous on the Lancaster Plain. This famous type has as its main diagnostic feature the projecting 7-8 foot forebay, or overshoot. The barn is banked, and organized such that the upper level consists of central threshing floor(s), flanked by mows for hay, straw, or unthreshed grain; and one or more granaries (sometimes in the forebay, sometimes next to a mow on the bank side). The Pennsylvania Barn almost always has a gable roof. On the lower level, stable and stalls (organized crosswise to the roof ridge, separated by alleyways for humans) housed horses, milk cows, beef cattle, and sometimes sheep or hogs.<sup>41</sup>

The Pennsylvania Barn was a highly flexible form. It ranged in size from just twenty feet long to over over a hundred. It could also accommodate features such as an "outshoot" or "outshed" that would extend back from the bank side; multiple threshing floors and haymows; a root cellar; a corncrib/machinery shed extension; a machinery bay on the lower level; or a 'horse power' on the bank side, or sometimes in the basement. The forebay might project unsupported, or it might have supporting endwalls or posts. Nomenclature for these various features varies, too. But, it is important to remember that in order to be considered a Pennsylvania Barn, a barn must have these essential features: a projecting forebay and banked construction, almost invariably with the eaves side in the bank.

The Pennsylvania Barn exemplified and facilitated the new grain-and-livestock agriculture. That is why it appeared when it did. Historian Steven Stoll has compared the Pennsylvania Barn to a cow – taking in raw materials and producing milk, meat, and manure. Indeed, the barn promoted productivity and its stable level and yard functioned to collect the valuable

manure (generated with feed stored in the upper levels) and to combine it with straw to make it the perfect dressing for crop fields. A local historian wrote that “straw, grain, corn stalks, and refuse from the stables” were “trampled under the feet of fattening cattle during the winter. The barn-yards were cleaned once a year... and this refuse was spread over the fields and plowed under the soil.... the farmer who had a large barn-yard full of manure to haul out, after harvest, was looked upon as a model.”<sup>42</sup> The barn design fit with the rising agricultural reform movement of the day, though whether it did so self-consciously is doubtful.

With its rational, centralized organization and gravity-fed multi-level arrangement, the Pennsylvania Barn also represented a response to an increased need for labor efficiency. Provision for horses reflected mechanization.

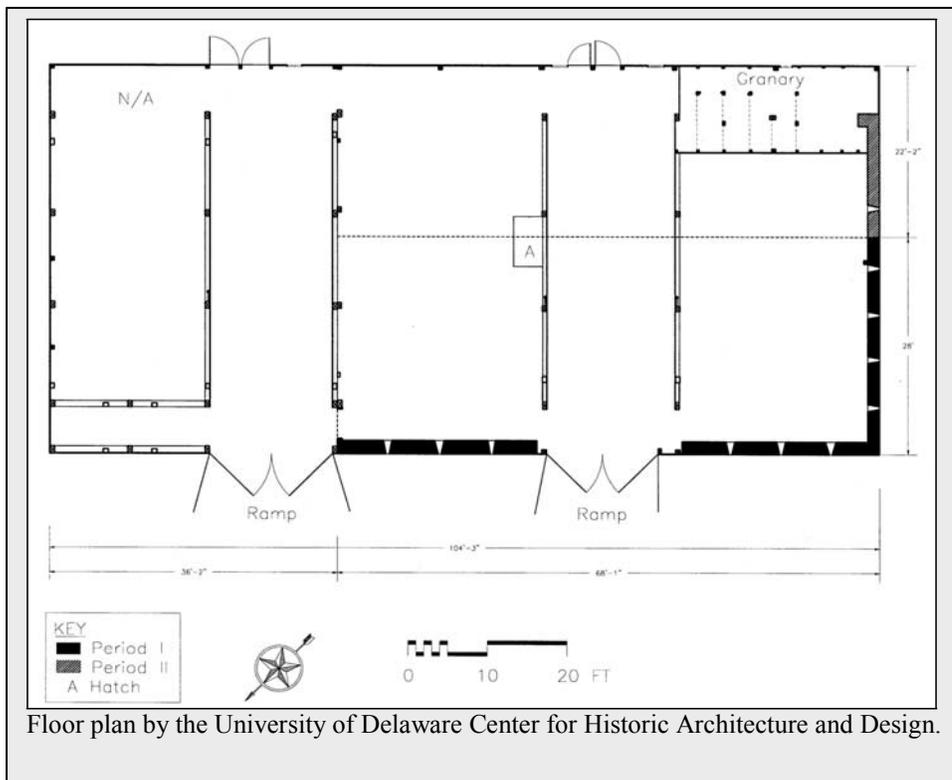


Schriner barn, Lititz vicinity, Lancaster County, 1827. Photographed by Charles H. Dornbusch in 1941. Historic American Buildings Survey, digital ID <http://hdl.loc.gov/loc.pnp/hhh.pa1488>



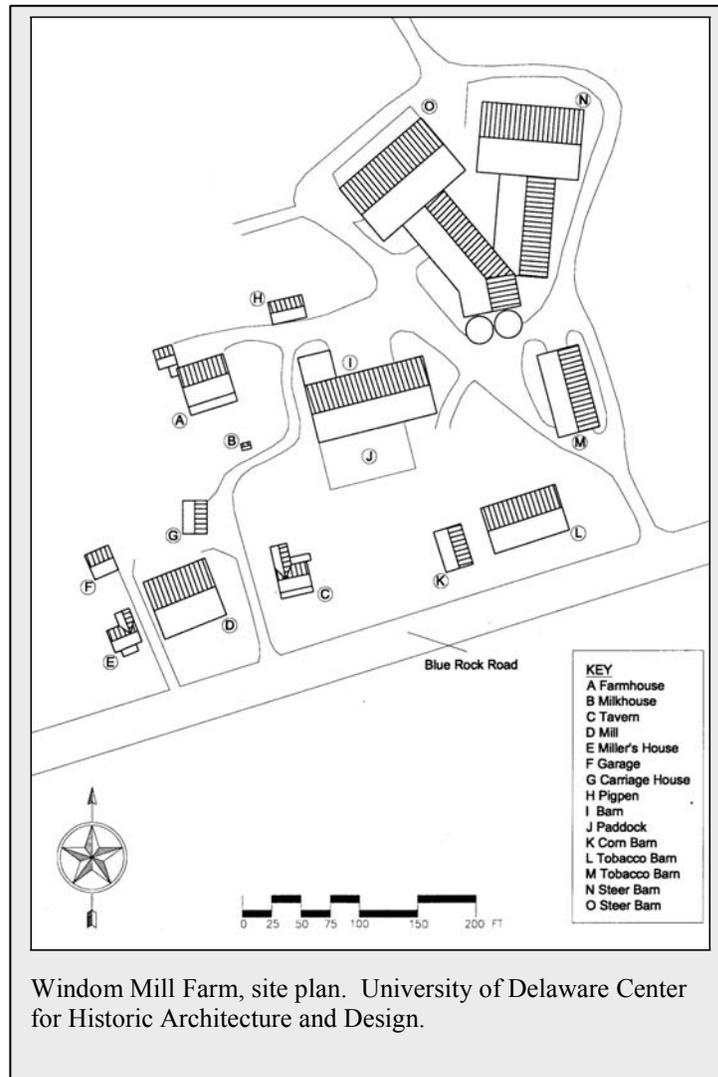
Windom Mill barn, Manor Township, Lancaster County, late 18th –mid 19th century.

Floor plan below.



Floor plan by the University of Delaware Center for Historic Architecture and Design.

Windom Mill barn floor plan, main block. The plan does not show the rear outshed or the gable-end machine shed. This barn originated as a stone barn and was enlarged twice. University of Delaware Center for Historic Architecture and Design.





Christian and Fanny Landis Barn, Lancaster vicinity, Lancaster County, 1842, photographed after 1933. Historic American Buildings Survey, digital ID <http://hdl.loc.gov/loc.pnp/hhh.pa1485>



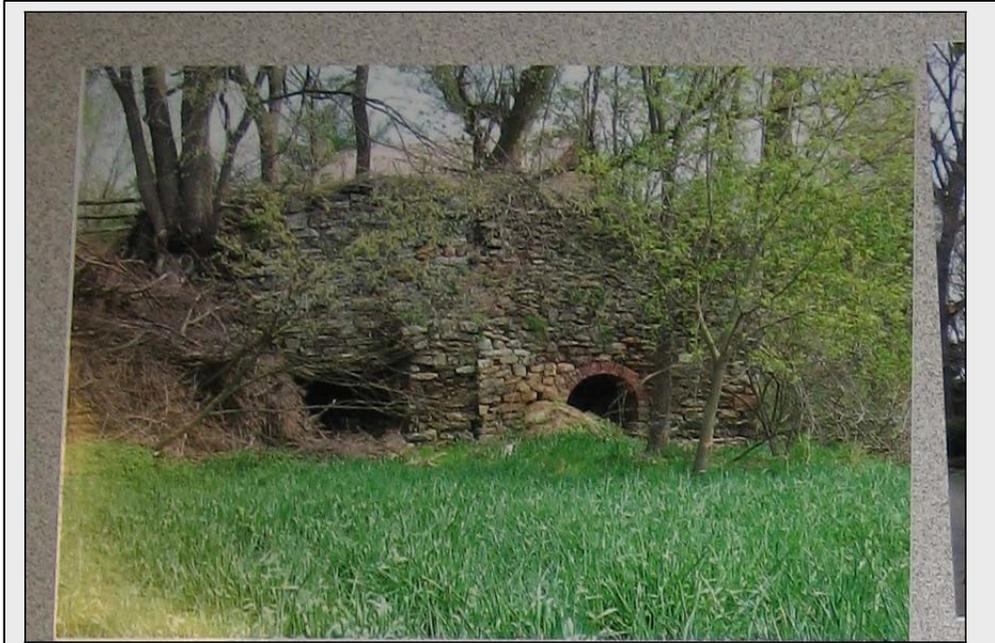
Lower level interior, Jacob and Elizabeth Miller Barn, 1804, Lancaster vicinity, Lancaster County, photographed after 1933. Historic American Buildings Survey, digital ID <http://hdl.loc.gov/loc.pnp/hhh.pa1490>

*Still House, c 1780-1865*

Still houses were apparently not uncommon in this period, but no extant examples were found in research for this document.<sup>43</sup>

*Lime Kiln, c 1780-1865*

Lime kilns were dry laid masonry structures which tapered from base to top and had openings in the base. Limestone was deposited into the stack through a hole in the top; the fire was built in the hearth below. The intense temperature caused a reaction which converted limestone (calcium carbonate) to lime (calcium oxide). After cooling, the lime was raked from the bottom. As we have seen, lime kilns were common on the Lancaster Plain and were often sited along a road.



Double lime kiln, Manheim Township, Lancaster County, 19th century. Pennsylvania Historic Preservation Bureau file photo.

*Spring house, c 1780-1865*

Spring house, David Davis Farm, Earl Township, Lancaster County, c. 1800.  
Pennsylvania Historic Preservation Bureau file photo.

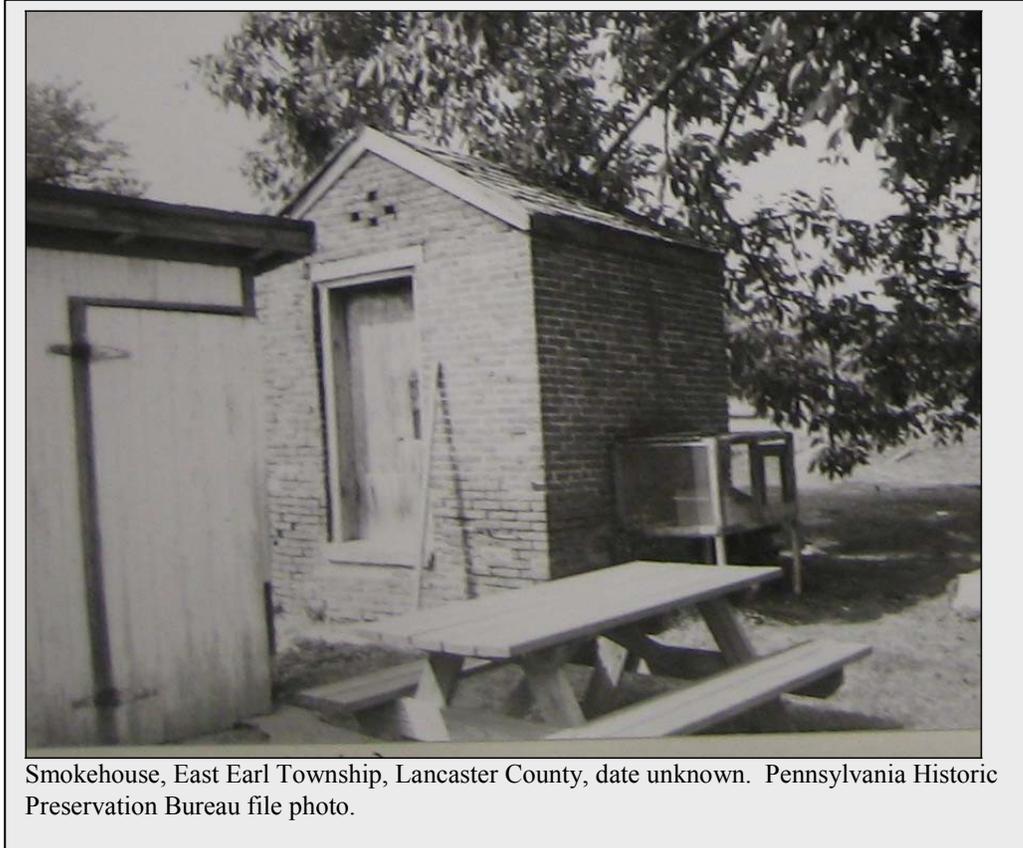
Spring houses supported home dairying and played an essential role in preserving other foods.

*Smoke house, c. 1780-1865*

By the nineteenth century, free standing smoke houses were more common than attic smoke chambers. They still served the same purpose: to provide a specialized space where meat (almost always hams and bacon) was cured using smoke. The smoke house usually was a small building with a more or less square footprint; an entry door; a gable or pyramid roof; and no openings, so the smoke would stay in the chamber. It was usually sited near the house.



Smokehouse, East Earl Township, Lancaster County, date unknown. Pennsylvania Historic Preservation Bureau file photo.



*Summer kitchen, c 1780-1865*

It is not certain how common summer kitchens were during this period, but probably by the Civil War Era their numbers were beginning to rise.



“Fry homestead, which has been in the family for seven generations.” Ephrata, Lancaster County, photographed by John Collier in 1942. FSA/OWI collection, Library of Congress, digital ID fsa 8c26497 <http://hdl.loc.gov/loc.pnp/fsa.8c26497>. The brick summer kitchen with attached bake oven may date from this period.



Summer kitchen, Hibschan Farm, Ephrata Township, Lancaster County, c. 1860-1890. Pennsylvania Historic Preservation Bureau file photo.



Summer kitchen, bake house, and smoke house, Denver Borough, Lancaster County, c. 1875-1900. Pennsylvania Historic Preservation Bureau file photo.

Real estate advertisements for the period mention many other outbuildings, including machine sheds, corn cribs, still houses, root cellars, ice houses, privies, wash houses, hay houses, cattle sheds, stables, a “Grain House,” and a “Corn Kiln.”<sup>44</sup>

### **Landscape, c 1780-1865**

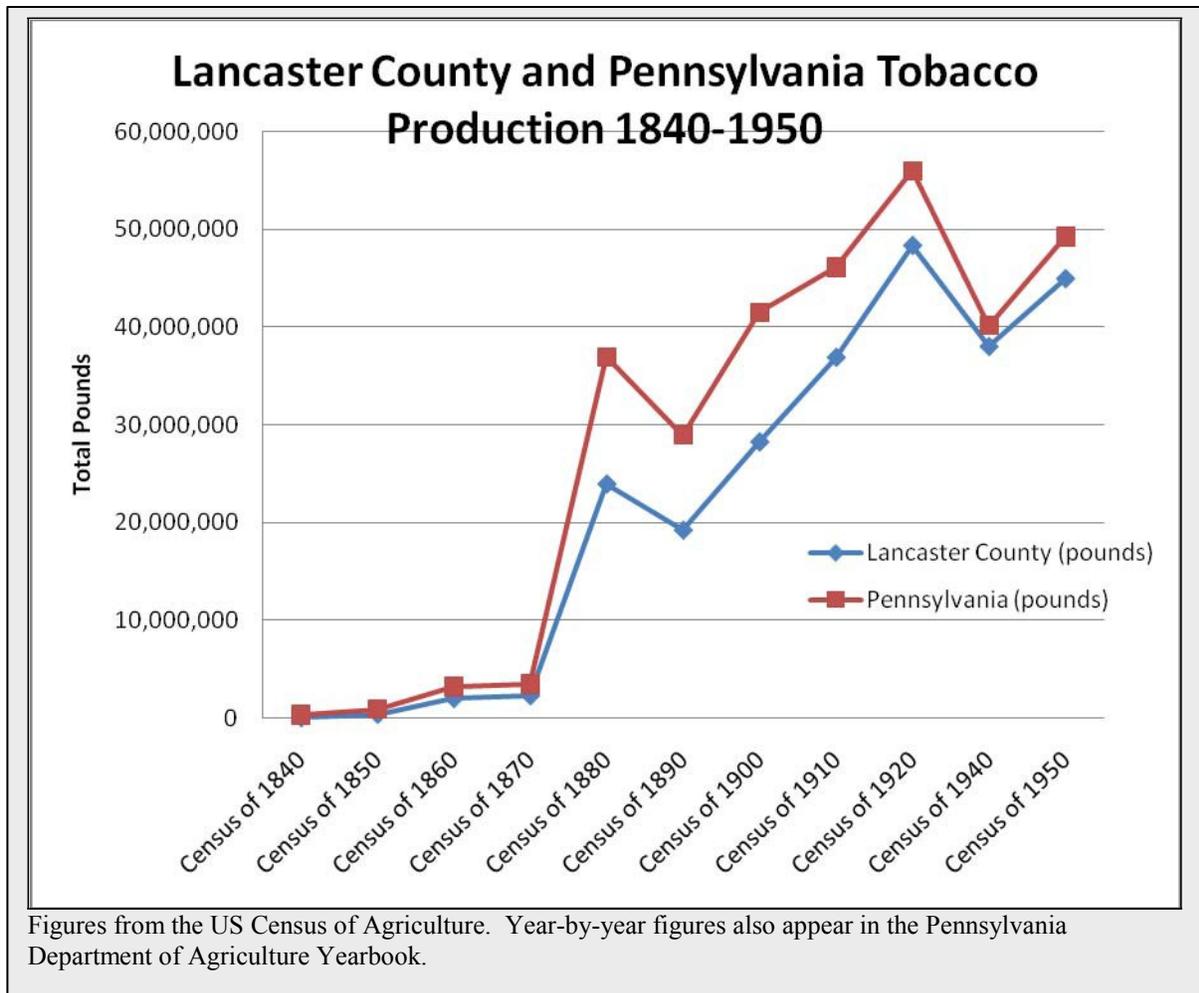
Probably few landscape features have survived from this period. Crop fields would have been relatively small and irregularly shaped, given the metes-and-bounds property system prevalent in southeastern Pennsylvania, and the small field sizes in conventional rotation. Hay meadow probably accounted for a significant chunk of the farm lands, perhaps as many as 10-15 acres.<sup>45</sup> Woodlots were small and shrinking. Farm burial grounds are mentioned and depicted in Schneider.

## **Crops, Livestock, and Tobacco, c 1865- about 1920**

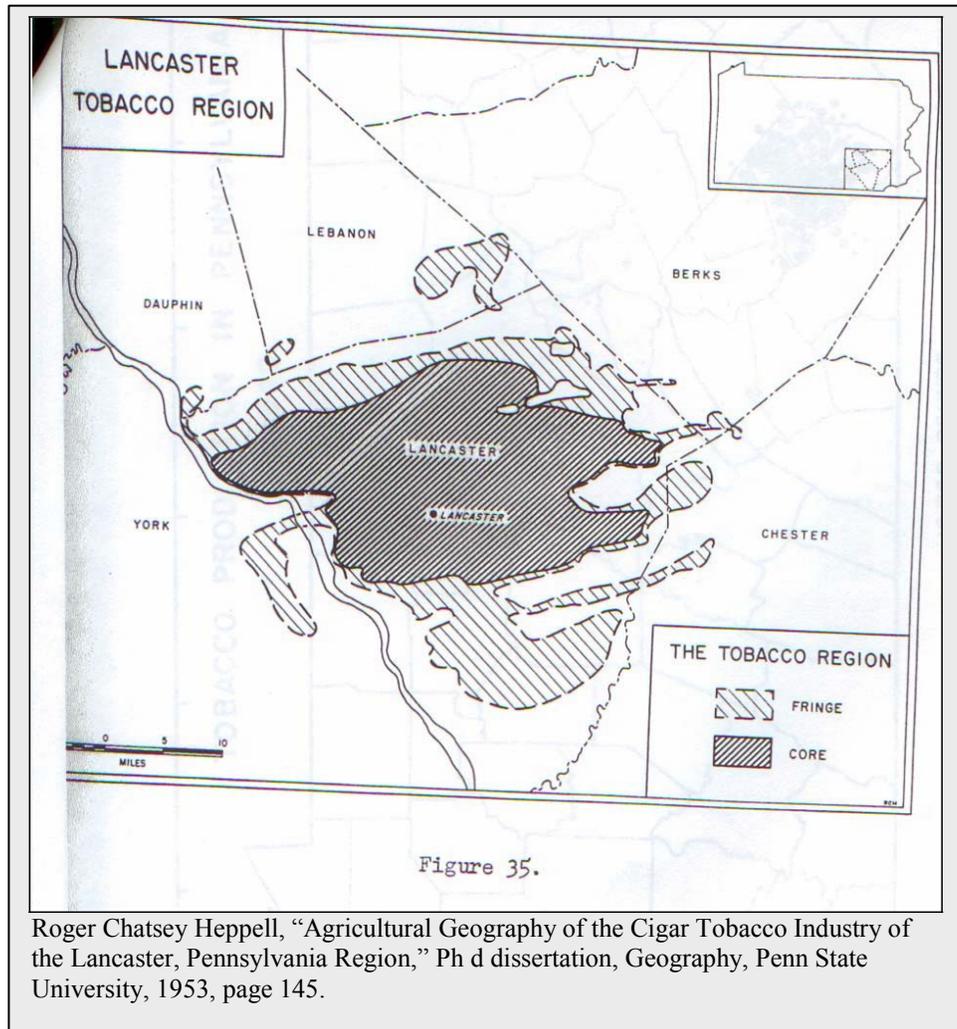
### **Products, 1865-about 1920**

The signature characteristic of this era was development. Between the post-Civil War years and the Great Depression, Lancaster County farming families added multiple layers to their agricultural system, while eliminating few. The single most important addition to the farming system was tobacco. It was smoothly integrated into the existing stall feeding and crop system in the late 19<sup>th</sup> century.<sup>46</sup> At the same time, the farm subsistence base was diversified and elaborated; farm families added new fruits, vegetables, and processed foods to the traditional favorites. Beginning around 1900, Lancaster County farm families expanded fluid milk dairying and simultaneously curtailed home butter production. At the same time they significantly enlarged their poultry business. The net result was an even more intensified, diversified and productive farming system than before.

The crop and livestock regime enriched many a Lancaster County farm family in the antebellum years and on through the Civil War, when feeding the Union Army became a pressing concern. The war also set a tobacco boom in motion, because the supply from the Southern states was disrupted.<sup>47</sup> At war's end, development in the west posed stiff competitive challenges; cheap wheat, corn, pork, and beef flooded eastern markets and made it difficult for Eastern farmers to hold their own. Panic (1873) and agricultural depression worsened the situation. Surprising though it might be from today's perspective, Lancaster County farmers worried about falling land values.<sup>48</sup> Farm numbers grew, and farm size shrank. For some eastern Pennsylvania farm families, urban growth provided a way out of the crisis through opportunities in dairying, market gardening, and hay sales. Lancaster County farm people did all these things, and more. To be sure, as before, Lancaster Plain farms continued their diverse crop and livestock production. But the key crop – the one that really made the Lancaster Plain distinctive – was tobacco.



Tobacco production in Lancaster County – and indeed in Pennsylvania -- was concentrated in the Lancaster Plain. While the 2 million pounds of 1850 and the nearly 3 million of 1860 were not trifling, the decade between 1870 and 1880 dwarfed earlier production levels. It was a period of astounding growth in Lancaster County tobacco production. By 1880 Pennsylvania, led by Lancaster County, had become the nation's third-ranking tobacco state, having increased production from about 3.5 million pounds in 1870 to 37 million pounds in 1880. By 1919 Lancaster County alone accounted for 50 million pounds. Thereafter, production dropped because the county produced exclusively cigar tobacco, and cigarettes were eclipsing cigars in popularity. Ironically, though, cheaper cigar brands -- made from domestic leaf -- weathered the challenge more successfully than the more expensive imported cigars, allowing the industry to hang on in Pennsylvania. In 2002, almost 900 Lancaster County farms raised 9.6 million pounds.<sup>49</sup>



The Lancaster tobacco region temporarily overreached the county's borders, but as this map shows, by the mid 20<sup>th</sup> century it essentially coincided with the Lancaster Plain.

Why did farm families on the Lancaster Plain turn to tobacco? A 1982 article in *Pennsylvania History* by Daniel B. Good addressed "The Localization of Tobacco Production in Lancaster County Pennsylvania." Good argued that the "complex of cultural characteristics of Amish and Mennonite tobacco growing families" accounted for tobacco's "localization." Plain Sect families, he reasoned, valued tobacco culture as a way to keep all family members occupied year-round in hand labor. Productive, non-mechanized family labor fit in well with Plain Sect commitments to simplicity, community, and agrarian life.<sup>50</sup>

However, Good's conclusions are erroneous. Simple demography makes it impossible that Plain Sect people accounted for most Lancaster County tobacco production before about the mid twentieth century. The eminent scholar Donald Kraybill estimates that the Amish population in Lancaster County around 1890 was only about 800. The total county population that year was nearly 150,000, and there were over 9,400 farms in the county, thousands of which were producing tobacco. Even adding other Plain Sect groups like the Mennonites and Dunkards would not account for a fraction of the tobacco growers. Good made a common mistake; he conflated "Pennsylvania German" with "Plain Sect." In fact, most Pennsylvania Germans -- about ninety percent by most estimates -- belonged to the "church" groups, Lutheran and German Reformed. They account for most of the people growing tobacco on the Lancaster Plain in the nineteenth and early twentieth centuries. As well, other, Anglo-American social groups farmed in the county. A 1935 Penn State Agricultural Experiment Station Bulletin estimated that there were 7,000 tobacco growers in the county.<sup>51</sup> It is clear that the original choice to grow tobacco cannot have been motivated solely by Plain Sect values or group members.

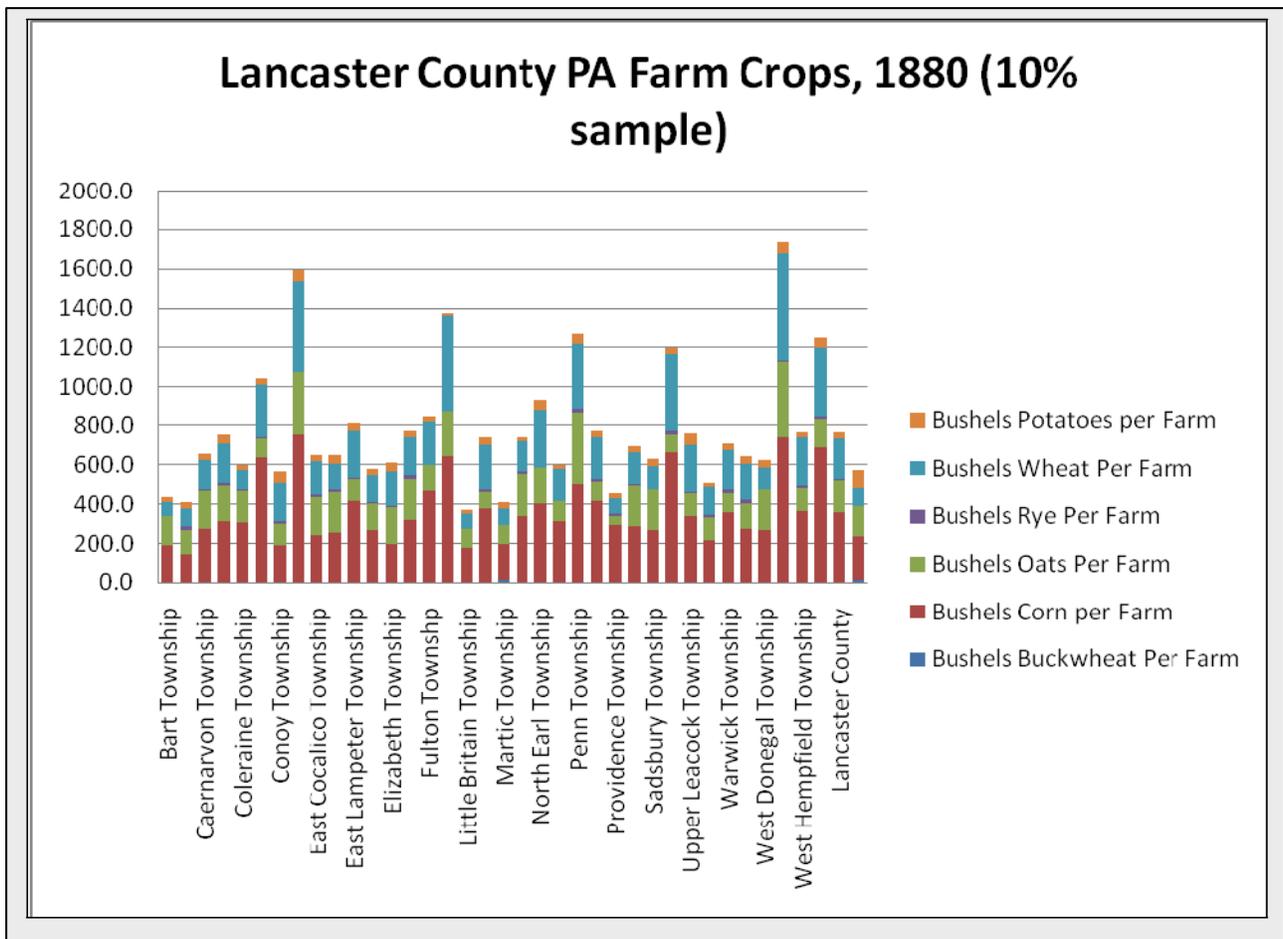
Roger Heppell, in a 1953 Penn State thesis, attributed the Lancaster Plain localization to supposed cultural attributes, namely a broader Pennsylvania German "rugged individualism and brotherly love."<sup>52</sup> However, geographic patterns call into question even a historical connection between "mainstream" Pennsylvania German ethnicity and tobacco growing in Pennsylvania. During the cigar heyday, tobacco was quite extensively grown in river-bottom areas in the heavily Yankee Northern Tier counties, and of course the Connecticut River Valley was another important tobacco growing region in New England. Conversely, there was little tobacco grown in heavily Pennsylvania German counties like Lehigh and Berks. The geographic distribution suggests that soil conditions, local topography, and local economies had as much to do with tobacco raising as ethnicity.

The confusion has persisted because by the late twentieth century, probably most Lancaster County tobacco *was* indeed grown by Plain Sect families. Hard data is scarce, but a 1942 study by sociologist Walter Kollmorgen suggested that Plain Sect families raised tobacco because it was remunerative, and because it still required hand labor and thus did not pose religious issues. Non-Amish families gradually abandoned tobacco production, supposedly because of labor issues. The historiographical problem arose when scholars extrapolated contemporary conditions backward into historical time.<sup>53</sup>

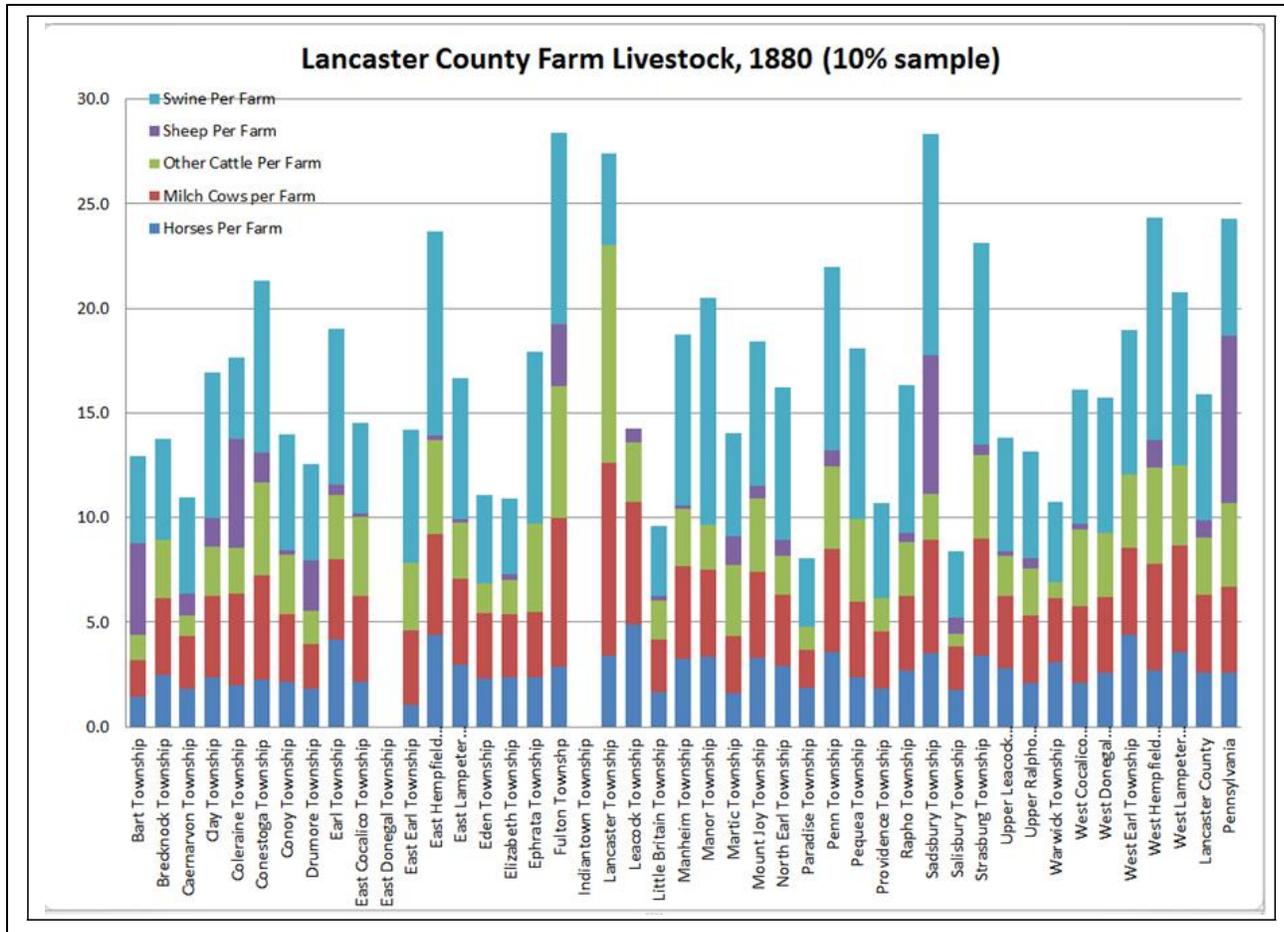
Tobacco growing probably was initially chosen in Lancaster County for several reasons. The tobacco plant grew well in the fertile soils of the Lancaster Plain; Penn State agricultural scientists believed that the soils on the Plain produced superior leaf.<sup>54</sup> Tobacco does best on land with low-relief topography, which is abundant on the Lancaster Plain. Though it was probably not a determining factor, the climate on the Lancaster Plain was well suited to tobacco.<sup>55</sup> Tobacco fit very well within the existing crop and livestock system. Not least, tobacco was a very lucrative crop on a per-acre basis. Frank R. Diffenderffer of Lancaster wrote in 1879 that "Taking the average realized per acre during the past twenty years, there can be little doubt but that it has been twice as great as from any other crop Pennsylvania is accustomed to grow."<sup>56</sup> High per-acre profitability was especially important because Lancaster County farms were shrinking. By 1880 the average Lancaster County farm was 61 acres, sixth lowest in the state; there were many farms of twenty acres and even less.<sup>57</sup> Farm size declined steadily to 51 acres in 1910 – the smallest Pennsylvania farm size except for Philadelphia County. The number of farms increased by over a thousand between 1880 and 1910, even as the total farm acreage declined; so farmers really needed a crop that paid well on a small acreage. Though tobacco plantings were typically under five acres, they were crucial to financial viability on these ever-smaller Lancaster County farms. Lancaster County historian Horace Barnes estimated that in 1880 only 1/25 of the arable land was in tobacco, but that tobacco accounted for 1/5 of total crop receipts.<sup>58</sup> It was therefore not surprising that by 1880 in some townships (East Hempfield, for example), nearly 100 percent of farms produced tobacco.

The tobacco growing boom in Lancaster County was fueled by the mania for the "cheap five-cent cigar." After the Civil War, cigar smoking became immensely popular, and cigar manufacturing became a major industry in Pennsylvania. Indeed, the term "stogie" derives from a Lancaster region-- the Conestoga watershed, where tobacco was grown early on. Some cigar tobacco, of course, was imported, but local growers furnished cigar leaf usually destined for cheap cigars, while the imported leaf went into the more expensive product. Lancaster County leaf was filler or binder leaf – the cigar's interior. Names for the seed were numerous, but generally, over time Lancaster Plain farmers adopted what they called the "Pennsylvania seed leaf" and eventually the U. S. Government labeled it "Type 41." Short lived experiments with wrapper leaf came to nought.<sup>59</sup>

Tobacco was added to traditional field crops, rather than substituting for any of them. By 1880 the typical Lancaster Plain farm had over eighty percent of its acreage in crops. This would include a small plot for tobacco, along with corn, oats, wheat, and hay. Various rotations were practiced, but they all involved wheat, grass, corn, and tobacco.<sup>60</sup> Corn production had actually increased on a per-farm basis since 1850, though other output decreased as farm size also dropped. Wheat production still exceeded Pennsylvania averages on a per-farm basis, so taking into account the small size of Lancaster farms, corn and wheat production was still disproportionately high. Buckwheat, potatoes, rye, and barley were raised in smaller quantities. The corn, oats, hay, and straw produced on the farm were mainly used for animal feed and bedding and rarely sold off the farm.<sup>61</sup> Wheat, however, probably went to market; Lancaster County averaged over 200 bushels per farm in 1880, and many Lancaster Plain farms grew even more, despite Western competition.



The typical 1880 Lancaster County farm livestock consisted of about 2.6 horses, 3.8 milch cows, 2.8 “other” cattle, six swine, and 36 barnyard fowl. These numbers were near or even below state averages. All were below 1850 averages for the county. In understanding them, we must take into account the small (and ever declining) size of Lancaster County farms and the attention devoted to crops, yet also note that Lancaster Plain townships generally had somewhat higher numbers. A few farmers raised draft horses for sale, also likely a few at a time.<sup>62</sup>



In sum, Lancaster Plain farming in the late 19<sup>th</sup> century was intensive (both as regards land and labor) and complex, but small scale.

Stall feeding continued to hold a key place in the Lancaster Plain farm economy, despite competition from the West. The manure was critical to maintaining soil fertility where so much depended on heavy feeding crops like tobacco and wheat.<sup>63</sup> The 1880 US Census “Report on the Culture and Curing of Tobacco in the US” noted that “if the farmer only realizes a fair price for the corn fed [to steers] he looks for no other profit for his trouble, well aware that the

increased size of his manure pile will make him ample amends, and that the fertility of his farm will be maintained.”<sup>64</sup> The agricultural census manuscripts show that typically farmers would keep one beef animal to slaughter, and sell the rest live. A 1910 observer claimed that 30,000 steers were fattened each year in the county; twenty years later, the USDA put the estimate at between 65,000 and 80,000. One account also mentioned that each year five to ten thousand steers were purchased and grass-fed, rather than stall-fed.<sup>65</sup>

During the late nineteenth century, some observers thought that artificial fertilizers were unpopular in Lancaster County. However, by the mid 1920s, the US Census published estimates indicating that Lancaster County farmers spent nearly \$900,000 on fertilizer. Moreover, local boosters noted businesses such as the Lancaster Chemical Company, maker and importer of agricultural chemicals and fertilizers.<sup>66</sup>

Where livestock pursuits were concerned, dairying took a back seat to cattle feeding in 1880. A few Lancaster Plain townships wholly in the Plain (notably West Lampeter) had notable dairy production, but the most productive dairy townships in the county were partially or wholly outside the Plain. Dairying competed for labor with tobacco.<sup>67</sup> The 1880 manuscript agriculture census shows that except for Warwick and Strasburg Townships, almost 100 percent of milk was made into butter on the farm. An 1883 report from the county estimated that half of this butter was sent to markets outside the county, mainly Philadelphia and Baltimore. Lancaster City also consumed farm butter from its neighborhood.<sup>68</sup> Soon, however, dairy production shifted toward fluid-milk sales, and farm-made butter declined as a proportion of the total milk production.

There were two main reasons for the change. Centralized “creameries” appeared; these took milk or cream from farms and manufactured it into butter. By the early twentieth century most Lancaster County municipalities had at least one creamery.<sup>69</sup>

At the same time, the refrigerated rail car combined with rapid urbanization and transport expansion to create a huge market for fluid milk, mostly for direct consumption. Rather than make milk into butter on the farm or send milk to creameries, farm families began to send fluid milk to population centers. The so-called “milk shed” (the catchment area from which a municipality received its milk supply) widened as rail networks penetrated further into the countryside. In 1914 the county agricultural extension agent noted that “the production of market milk in the vicinity of Lancaster is fast becoming greater than the local raw milk market is demanding,” so “arrangements were effected with a Philadelphia firm to accept all surplus milk at desirable rates and to provide a \$10000 cooling station. He wrote that this scheme “will advance milk prices generally for the milkmen.”<sup>70</sup>





Creamery, Lititz, Lancaster County. The creamery was sited by a stream and had its own “milk house.” 1898 Sanborn Map, Sheet 5.

Poultry raising expanded significantly. In 1880, Lancaster County farms had about three dozen fowl, right around the state average. But poultry numbers subsequently took off; by 1910, on much smaller farms, Lancaster County averaged 76 chickens, well above the state average. In total poultry numbers (over 800,000), Lancaster County far outstripped any other county in the state. Numbers continued to climb as poultry raising for meat and eggs assumed a central place in Lancaster Plain agriculture. Poultry raising was well adapted not only to market conditions but to small farm size.

As before, a great many farm products did not make it into the Census accounting. The butchering process, for example, resulted in sausage, scrapple, lard, ham, bacon, and fresh meat. A large vegetable patch provided edibles like cabbage, carrots, greens, turnips, rutabagas, radishes, onions, squashes, peppers, corn, beans, beets, broccoli, cucumbers, tomatoes, and celery. These all had to be processed or stored in one way or another. Virtually every farm had an orchard, dominated by apple trees. Popular local varieties included Smokehouse, Fallawader, and Red Astrachan.<sup>74</sup> The fruits went into apple butter, cider, schnitz, vinegar, and sauce. Pears, cherries, and peaches were also grown. Raspberries, strawberries, gooseberries, asparagus, and rhubarb were popular. The farm wife kept busy making pickles, sauerkraut, preserves, and jams, as well as drying beans, apples, and corn.

Food processing possibilities expanded in the late 19<sup>th</sup> and early 20<sup>th</sup> century. Cheap sugar made jams and preserves affordable. Canning supplies and techniques also improved, as did stoves used in performing this work. Thus canned goods and preserves joined foods processed in traditional ways.

Truck farming expanded during this period. The city of Lancaster had several market houses throughout the city, fed by rail and trolley lines from the countryside. "In manifold ways," a local booster proclaimed, "the traction or trolley system has brought town and country together." Other urban facilities processed truck garden produce; for example, in Manheim there was a corn drying facility in 1912, probably for drying sweet corn. Quantitative data for truck farming don't exist for this period, but anecdotal evidence suggests that Lancaster County's sobriquet "Garden Spot" was well earned. In 1908, for example, an observer noted "many private gardens" that sold locally, along present day Route 30 in Greenland, East Lampeter Township. Indeed, truck farming took place at many points between Lancaster and Christiana. Smaller municipalities also supported truck farming. Sanborn maps show produce warehouses along town railroad sidings in Manheim in 1886. By the early 20<sup>th</sup> century, nurserymen and florists were opening large greenhouses on town peripheries. For example, in Manheim in 1912, three people with the surname Hostetter (Monroe, E. P., and P. S.) owned large greenhouses, some extending a full block. In Lititz, florist H. H. Garvin operated three large greenhouses at the corner of Spruce and West 2<sup>nd</sup> Street in 1927.<sup>75</sup> These businesses likely produced plants for local truck farmers, as well as flowers and other ornamentals. Related firms like the Park Seed Company also originated in Lancaster County.

So, even as they stepped up tobacco production, continued stall feeding beef cattle, and followed intensive crop farming, Lancaster County farming families were also getting into dairying more seriously; raising many more chickens; and raising, processing, and selling more garden produce.

### Labor and Land Tenure, 1865-about 1920

It is no wonder then that despite their small size, Lancaster Plain farms were heavily mechanized. The typical 1880 Lancaster County farm had \$250 worth of machinery, and in the heart of the Lancaster Plain, average machinery value reached as high as \$500. Horse powered plows, reapers, mowers, threshers, grain drills, harrows, and many other implements were common sights. Many farms had a team of mules, too. As late as 1925, 39 percent of Lancaster County farms had mules, and 88 percent had horses. The horse power era had not yet passed, by any means.

Transport, however, was revolutionized by the combustion gasoline engine; close to 100 percent of Lancaster County farms had an automobile by 1925. A third of farms had electricity, and twenty percent had tractors. About a quarter had running water. All of these numbers were above state averages, some well above. The figures remind us that Lancaster County agriculture at this point was not by any means synonymous with Plain Sect technology choices.



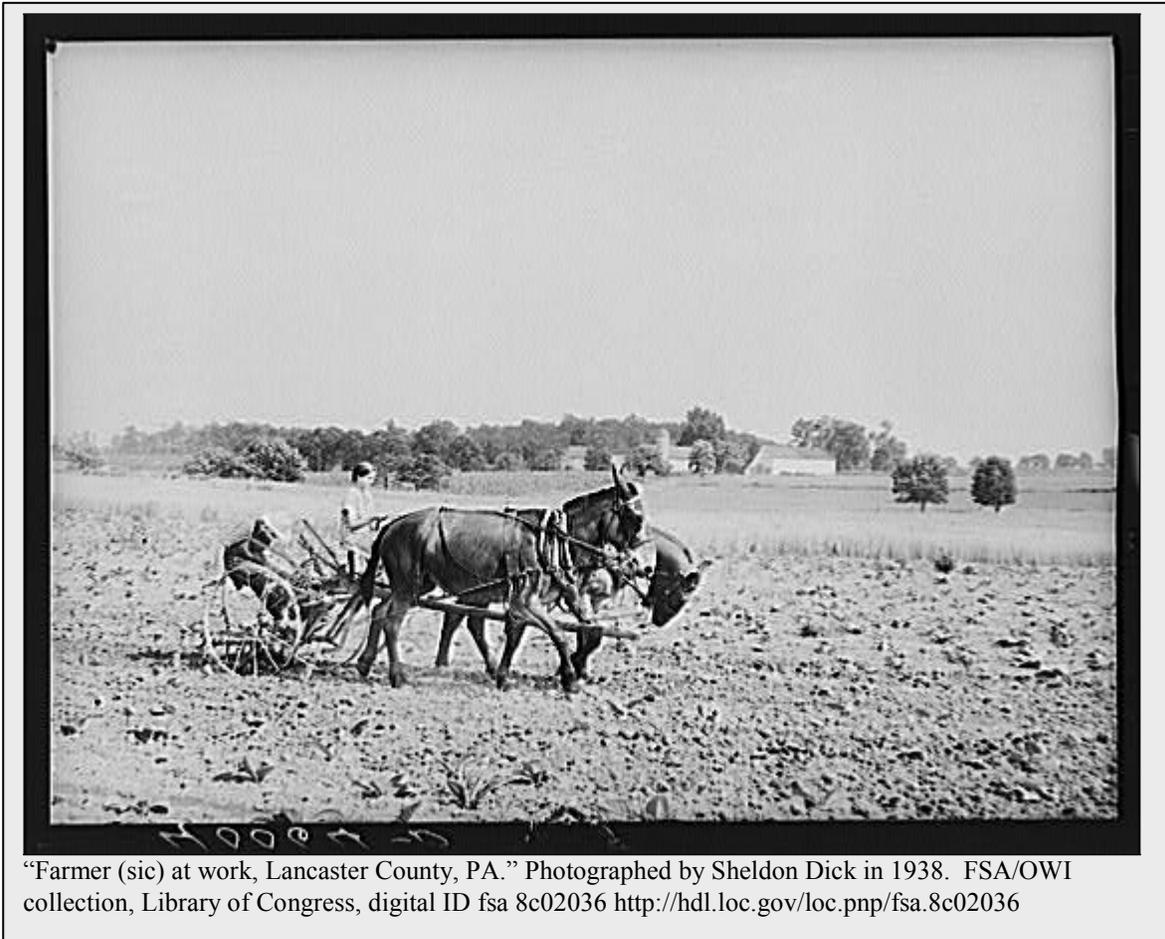
Men and women working together in a Lancaster County tobacco field, late 19th century. Philadelphia Commercial Museum Photo Collection, Manuscript Group 219, Box 11, #9975 n. a. 2506. Pennsylvania State Archives.

Despite heavy mechanization, much hand labor was still required on Lancaster County farms, particularly because tobacco culture demanded year-round labor. It began with sterilizing the seed bed, followed by carefully planting the tiny seeds, watering the seedlings, thinning, transplanting, weeding, cultivating, topping, suckering, de-worming, harvesting, storing, and finally stripping. Spraying for pests, cleaning seed, and steaming seed beds (for sterilization) joined other tasks by the early twentieth century. Preparation for market took a lot of work. One observer noted that the Lancaster County tobacco grower, “unlike his brethren elsewhere, prepares his tobacco in the shapes that make it easy to be handled by the dealer, sorting the leaves according to size and packing them together in neat bundles.”<sup>76</sup> Soon after the warehouseman collected one year’s crop, preparation began for the next season. Tobacco work was not significantly mechanized in the 19th century. A few innovations appeared, such as the horse drawn transplanter,<sup>77</sup> but it is not clear how many people invested in such implements when their acreage was so small.

Farm labor for raising tobacco and tending to the other myriad farm tasks was assembled from family, hired wage workers, and tenants. The discussion below takes each of these in turn, though it must be noted that often all of these types of labor were used simultaneously. Moreover, not infrequently, tenants or hired hands were also family members.

Family members supplied most labor on the Lancaster Plain farm. As elsewhere in Pennsylvania, a loose gender and age division of labor prevailed; men performed field work and handled large animals while women tended poultry and hogs, cooked, cared for children, gardened, and processed foodstuffs. Children were assigned chores. Yet, it is important to note that these lines were seldom hard and fast. There was a good deal of crossover.

Men, women and children worked in tobacco culture. For example, the 1879 *Lancaster Farmer* noted that “country girls from Lancaster and other counties” worked at setting out plants and weeding, for 75 cents a day.<sup>78</sup> Period photographs show women harvesting, planting, and weeding tobacco. During the winter, entire families stripped the leaves from the stalk, sized and graded them, and collected them into “hands” for market. This work usually occurred in the tobacco barn “stripping room.” One writer worried that children spent too much time stripping tobacco and not enough time in school.<sup>79</sup>



No comprehensive study of Lancaster Plain farm labor has been made, but a sampling of James Frey’s collations for Earl Township in 1880 suggests that averaged sized farms combined family and hired labor. Eli Martin, for example, owned a 61-acre farm; besides his immediate family, two apparently unrelated teenage workers lived in the household: Annie Shirk, servant; and Samuel Eaby, farmhand. Levi Weaver owned 37 1/4 acres and employed servant Clara Gear. M. Peter Zimmerman owned 100 acres and raised 10,500 pounds of tobacco; when the census taker came to his farm, residing there were Zimmerman, his wife, five daughters aged six to eighteen, plus 23 year old farmhand Jesse Ludwig. More often than not, Earl Township farm households contained servants or farmhands, some as young as nine years old. Others did not list farmhands in the household, but nonetheless paid wages.<sup>80</sup> For example, Daniel Symons had a young family and rented 82 acres; he hired 52 weeks’ worth of farm labor.

Hired labor frequently was obtained from neighbors or kin. In 1910 A. G. Seyfert of Lancaster County reminisced about his days as a hired boy, back in the 1860s. At ten he was hired out to a neighbor for ten dollars a year. He felt “practically as one of the family.” For a decade he served, working for several different households. “The unwritten law of the farm was that the hired man was never his own master, and often had to work long days during the busy season of the year... I was supposed to do the morning, noon, and night feeding of the stock [on Sunday] the same as on any other day.” Yet he “always had a comfortable home, plenty to eat and no cares to worry about.” Farmhands didn’t always get paid in cash. Though one employer offered Seyfert forty dollars a year, “all I got out of it in real cash was two dollars for spending money.”<sup>81</sup> Seyfert remembered his farmhand days fondly, yet ambivalence tinged his memories as well.

In addition to live-in hired farmhands and “servants,” day laborers filled out the farm wage labor force. They came from the country neighborhood (or sometimes from the city or town) and worked on an irregular basis. By the early twentieth century the trolley system connecting Lancaster with its hinterland served to move farm and factory workers back and forth.

Another common means of organizing labor in the tobacco region was tenancy. Tenant farming was already a well established part of Lancaster County agriculture, but tobacco culture brought renewed emphasis. In the county as a whole, tenancy was above average (28 percent versus 21 percent) in 1880. In the heart of the Lancaster Plain, several townships (Earl, Leacock, and Ephrata for example) had still higher rates. Tenancy rose steadily during the tobacco boom. An 1894 article by Dr. George Groff used tax records to conclude that there are “18,494 resident freeholders, 16,343 male tenants and 1,107 tenant women” in the county. Some of these were city people, but nonetheless the figures show that farm tenancy was a significant institution. Farm tenancy reached 41% in 1925, highest in the entire state.<sup>82</sup> Some observers thought that tobacco offered new opportunities to get established in farming, but the figures suggest that if anything the opposite was true. The number of farms in Lancaster County certainly increased during the tobacco boom, but so did the tenancy rate. Rising land values, high cost of equipment and stock, partible inheritance, and low outmigration probably combined to make land ownership an ever more elusive goal. Possibly kinship-based share tenancy was a mitigating factor, since these tenants actually were part of the owner’s family.

Several different types of tenancy arrangement evolved. In one, the tenant farmer rented land “solely for the growing of tobacco.” The tenant furnished labor, plants, and paper and twine for baling. The owner furnished horses, equipment, curing-shed space, and manure, and he prepared the seed bed.<sup>83</sup> These tenants were called “croppers.”<sup>84</sup> They usually received a share of the crop as payment, but essentially they were laborers rather than farmers. So were their families. The 1880 US Census report on Pennsylvania tobacco said of croppers: “the labor being light, much of it is performed by the women and children of the family; so that there is really little or no expenditure in cash on the part of the cropper.” This statement reveals much about patriarchal control of labor in tobacco farming, and also about perceptions of whether labor was light or heavy.<sup>85</sup>

In another variation on share tenancy, a landowner rented out a complete farm. The lease gave incentives to keep livestock and even prohibited tenants from “selling any hay, straw, or stover from the farm.”<sup>86</sup> Tenants either paid money rent or received a share of all the crops (usually half) and often furnished fertilizer as well as labor. Quite often, tenants and landlords were related by blood or marriage. Pennsylvania German families commonly practiced kinship-based share tenancy, which derived from an Old World custom called the “Altenteil,” or “old people’s part.” Younger family members worked land in return for a share of the crops, often splitting the shares with a widowed mother or with a father who had retired from active farming. Patriarchal control characterized the system: as father, uncle, or father-in-law, the landowner exerted considerable control over the tenant. Knowing this context helps us interpret the census. For example, in Earl Township in 1880, George Zimmerman, a 27 year old sharecropper, had a wife and infant son; they lived with George’s father, Christian. Three of George’s siblings, 24 to 32 years old, completed the household. It is very likely that George was renting on shares from Christian. Share tenant Aaron Hoover, 35, lived in a household headed by Isaac Hoover, a 66-year old retired farmer. Likely Aaron was renting from Isaac.<sup>87</sup>

**Buildings and Landscapes, c. 1865- about 1920***Houses, 1865-1920*

Abraham and Anna Herr House, Pequea Township, Lancaster County, dated 1877. Pennsylvania Historic Preservation Bureau file photo.



Four over four farmhouse with two doors, Pequea Township, Lancaster County, c. 1875-90. Pennsylvania Historic Preservation Bureau file photo.

The two-door house continued in popularity during this period.<sup>88</sup> More often they were executed in frame, and incorporated period styles. An essential conservatism marked farmhouse architecture in this period. The 1877 Abraham and Anna Herr House, for example, has a facade with five bays on the lower level and four, separated by a date stone, on the upper level. Its minimal ornamentation typifies the period. To be sure, a few families adopted current styles like the Colonial Revival, but in general, Pennsylvania Germans made conservative architectural choices in their houses. This tendency was by no means confined to Plain Sect members.

*Barns, 1865-1920*

The vaunted Pennsylvania Barn continued to be by far the predominant type in the Lancaster Plain. Late nineteenth and early twentieth century versions combined new with older features. The basic barn design did not change: above, a ramp led to one or more threshing floors, flanked by mows. Granaries were built into the forebay or sometimes on the bank side. Below, stalls and stables accommodated horses, cattle, and sometimes other animals. Most barns were now wood sided. The timber frames were mainly heavy post and beam structures; log was passé. Timbers were more frequently machine sawn rather than hand-hewn, and the joinery was simpler. Covering consisted usually of vertical board, increasingly produced using circular saws.



This barn is a good example of a late 19<sup>th</sup> or early 20<sup>th</sup> century barn. To the right, a shed-roof gable-end addition combines machinery bay, corn crib, and (to the rear of the corn crib) tobacco storage. The windows in the second story and at left suggest possible modifications for poultry. The chimney might be either for a stripping room or for warming baby chicks. Modern metal ventilators and lightning rods line the roof ridge.

The newer features of the Pennsylvania barn reflected agricultural changes of the day. For example, many now incorporated a machinery bay on a gable end, or integrated within the main structure. Mechanization was also reflected in a “horse power” shed, located on the bankside or sometimes in a basement. Provision for tobacco might appear as a dedicated wing, or as improvised tiers of lath in the main barn. Integral gable-end corn cribs were also sometimes incorporated into the barn structure.

The Stoner Barn in West Lampeter Township illustrates the important trends of its day. It was built in the early 1870s, and its relatively small size reflects the shrinking size of Lancaster County farms. Yet for all its diminutive scale, it also incorporated mechanization and current diversified strategies. An integrated machinery bay on the ground level provided for storage, and a horse-power extension on the upper bankside housed the motive power for machines used inside the barn. Tobacco cleats in the framing accommodated this important cash crop without a dedicated building, thus centralizing agricultural functions, and an integrated corn crib did the same thing. Neither was aesthetics ignored; the forebay side was decorated with round louvered ventilators.

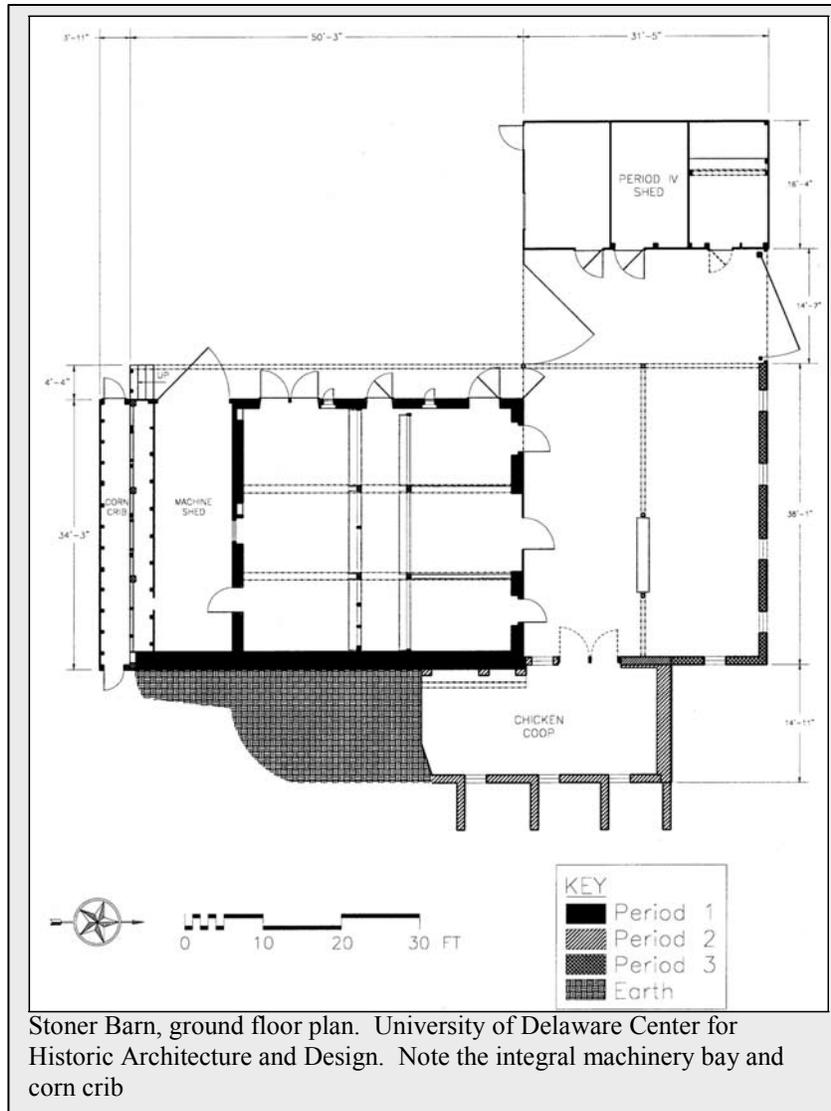


Stoner Barn, West Lampeter Township, Lancaster County, c. 1870

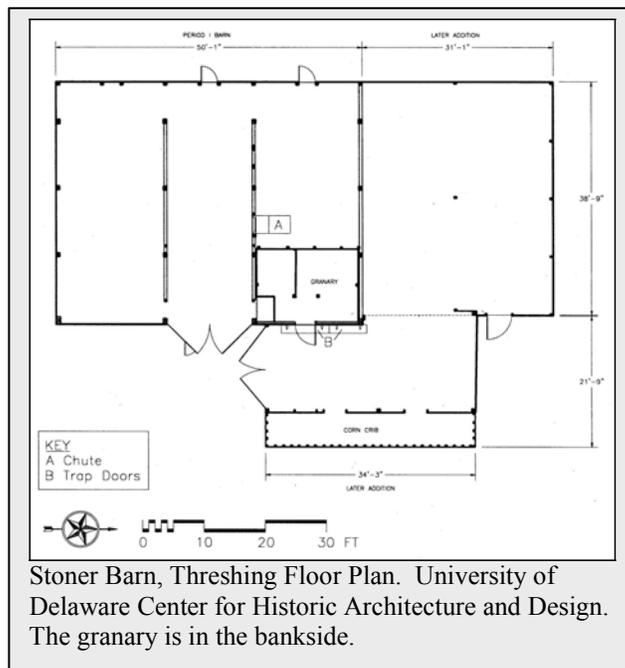
This Pennsylvania Barn incorporates an integral machinery bay; chicken coop; horse power shed; tobacco lath; and corn crib.



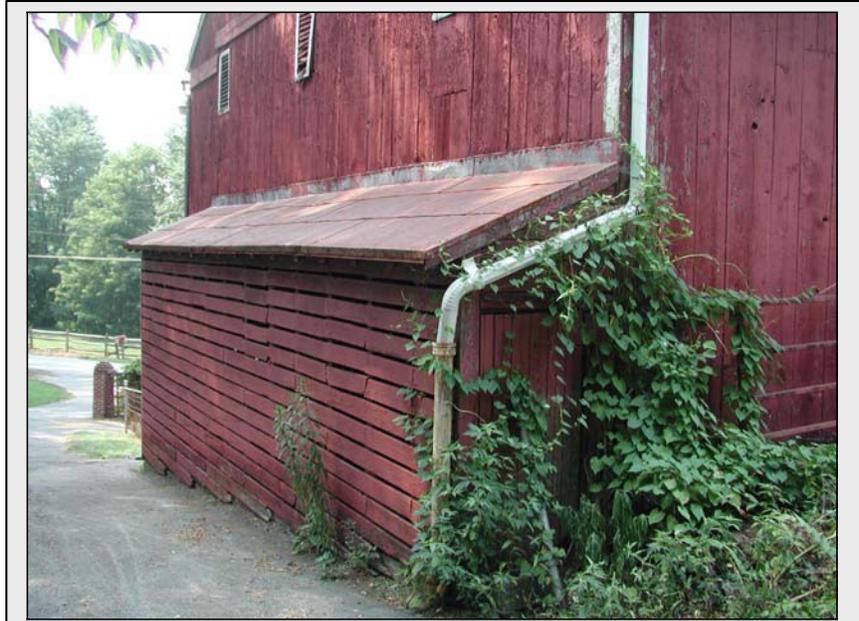
Horse Power Shed, Stoner Barn



Stoner Barn, ground floor plan. University of Delaware Center for Historic Architecture and Design. Note the integral machinery bay and corn crib



Stoner Barn, Threshing Floor Plan. University of Delaware Center for Historic Architecture and Design. The granary is in the bankside.



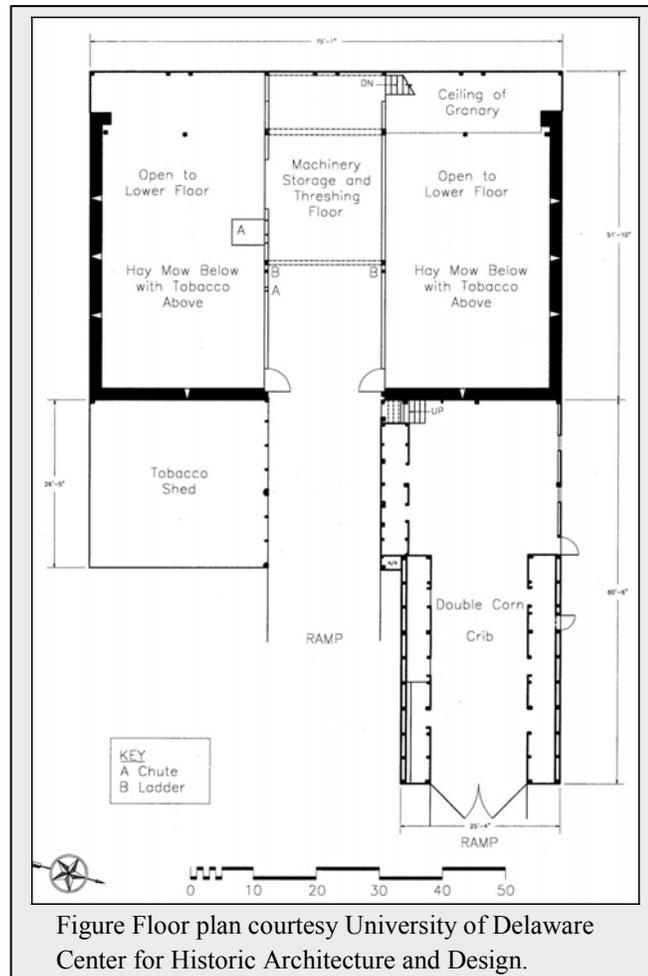
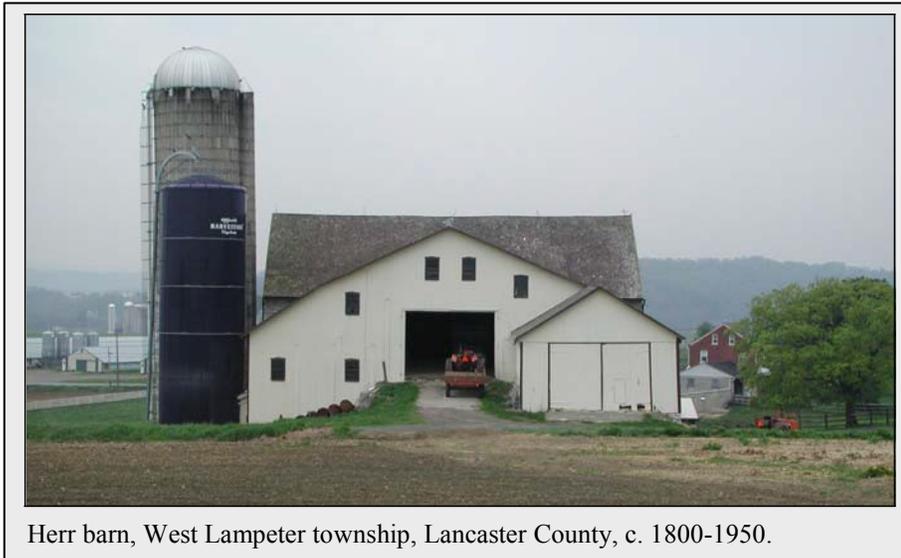
Stoner Barn, corn crib.

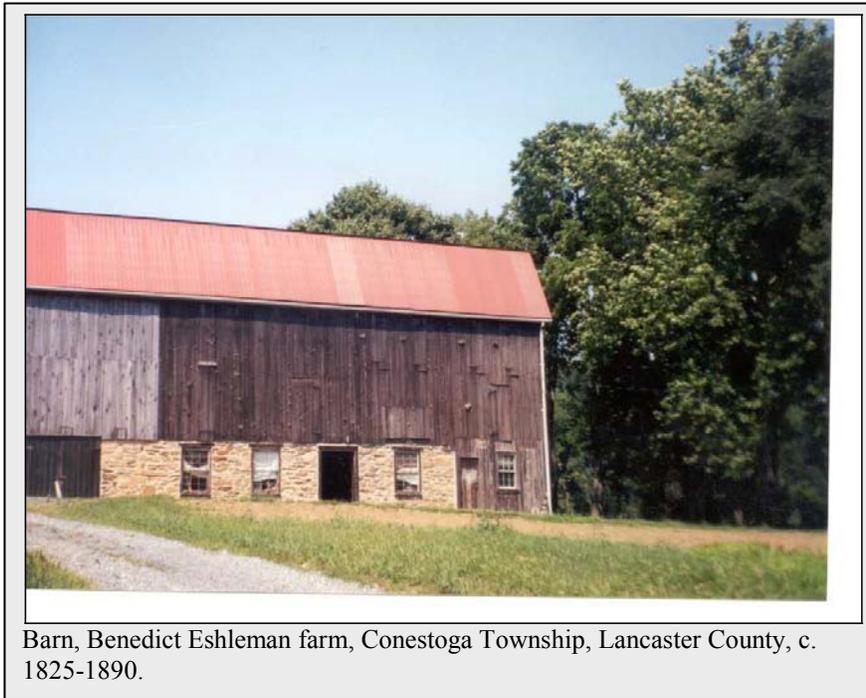


Stoner Barn, rails and cleats for tobacco hanging in the main barn.

Though separate tobacco barns were common, some farmers adapted their main barns. They might add onto one end of a larger barn, or mount "cleats" on threshing floor level framing members to receive tobacco rails.<sup>89</sup>

Below: Herr barn, West Lampeter Township, Lancaster County, c. 1800-1950. Floor plan and upper level bankside view showing accommodation for tobacco within the main barn. The earliest portion of the barn (a “double decker”) dates to the about 1800, with rear additions in the twentieth century.





The image shows how a Pennsylvania Barn was modified with a tobacco section extending from the gable end.

### *Tobacco Barn, 1865-1920*

The most notable addition to the Lancaster Plain farming landscape during this era was the specialized tobacco barn. Thousands of these distinctive structures were erected during the tobacco boom, and many are still standing. These are overwhelmingly frame structures, with stone or cement block basements. Pennsylvania cigar filler and binder leaf requires air-curing. Therefore the most conspicuous feature of any Pennsylvania tobacco barn is that its cladding can be opened and closed to regulate ventilation. Rather than being nailed tight to the frame, the exterior covering boards are hinged. When tobacco is curing in the barn, these slats are opened up. Vertical siding is hinged at the top or along the vertical edges, and held securely when closed by metal latches. Horizontal siding is hinged along the long side of the board, and sometimes a vertical bar connects all the boards so they could be opened simultaneously.

The barns usually have evenly-spaced roof-ridge ventilators, or sometimes monitor-style vents that run almost the length of the roof ridge. On the interior, between structural framing members, lighter "rails" are arranged crosswise in tiers, nearly to the gable peak. These rails are generally about 4-5 feet apart. The lower rails are often not permanently attached to the frame but suspended in cleats, so they can be removed to admit wagons or to permit filling the upper tiers. Short (4-5 foot) "laths" laden with tobacco leaves are laid across the rails about eight inches apart. The tiers are filled from the top down. Frequently, hatches in the upper floor lead to a basement dampening room, a humid, below-ground space, where the brittle cured leaves can regain their suppleness before being stripped, and where baled tobacco can be stored before being sent to market. Another key feature of the Pennsylvania tobacco barn is the stripping room. This is a space, usually heated by a stove (hence these barns often have chimneys or stovepipes) and lighted by windows, where workers would detach the cured leaves from the stalk during the winter months.<sup>90</sup> Usually it is achieved through banked construction. Multi-level tobacco barns could have either gable end banks or eaves-side banks, and the stripping room also could occupy either the gable end or eaves side. Lancaster County style tobacco barns are visually and spatially an integral part of the farmstead. They are near the house and main barn and are often painted to match other buildings.

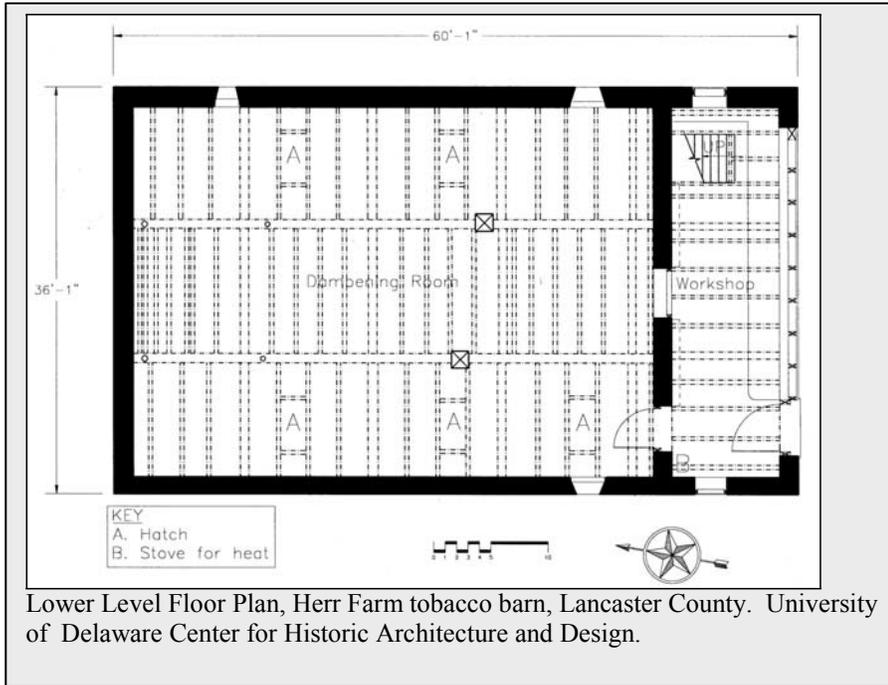
Since tobacco hung curing in the barn only a short time in the year, some tobacco barns were designed to serve other purposes in the off-season.<sup>91</sup> At Windom Mill Farm in Manor Township, for example, one of two tobacco barns contained a horse-power which was designed to be connected to a neighboring corn barn by a belt.



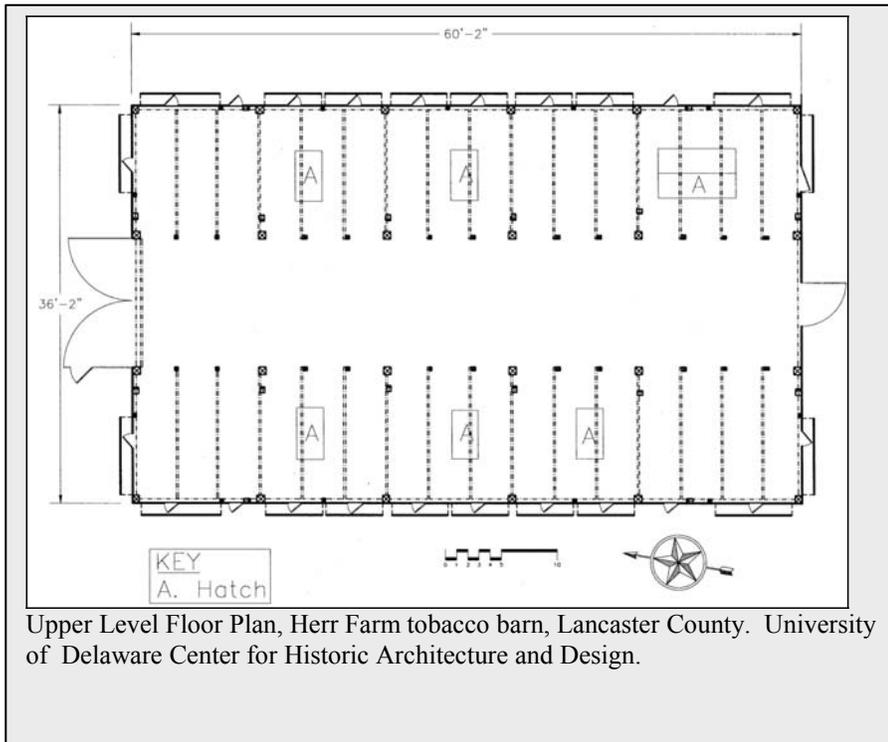


Herr tobacco barn, West Lampeter Township, Lancaster County, 1907

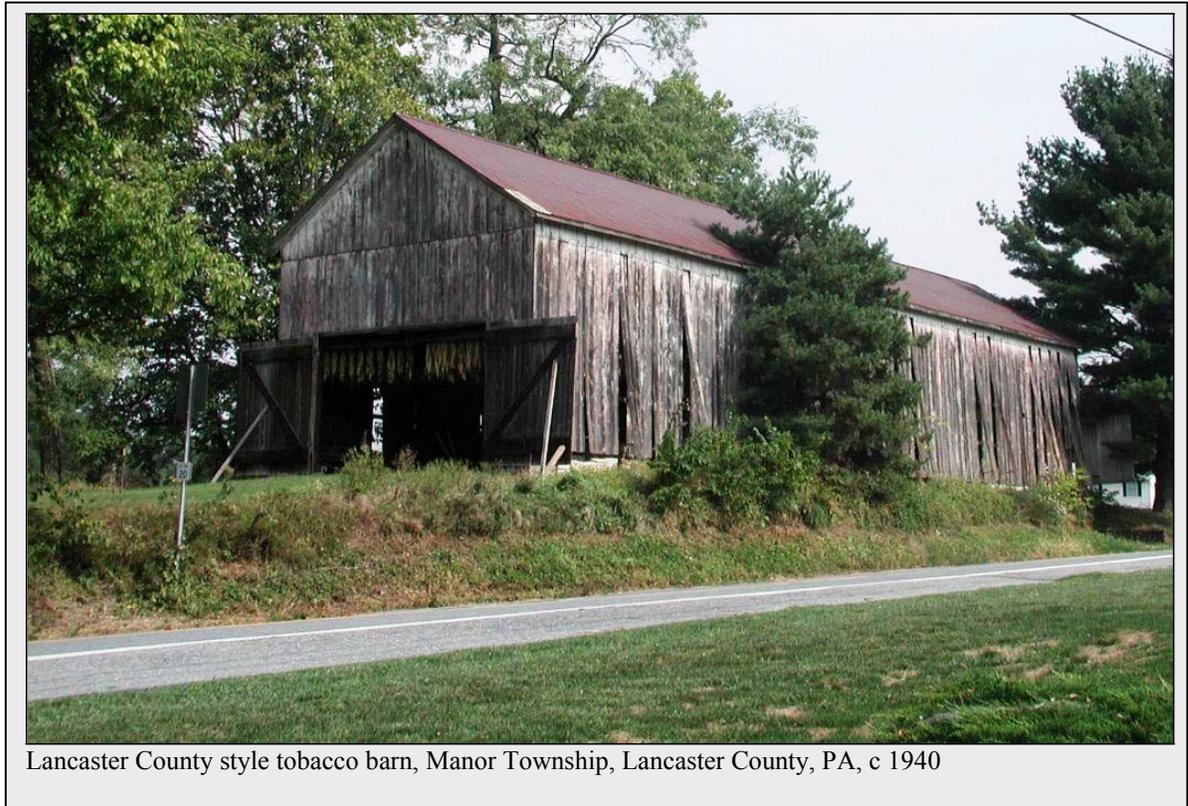
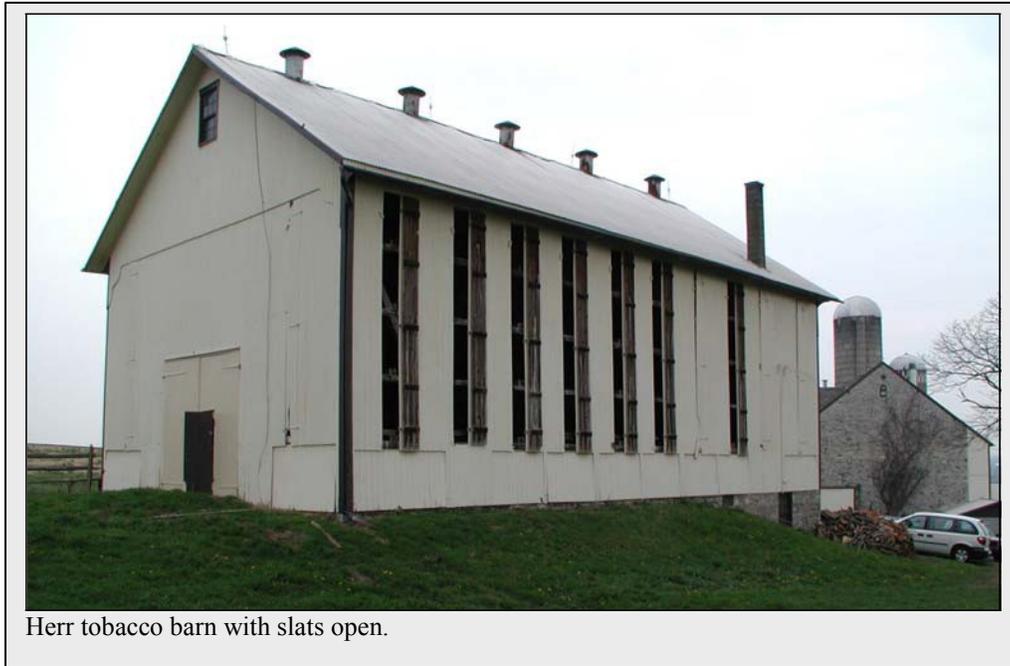
This barn has vertical slats, metal ventilators, and a gable-end stripping room. The vents are closed in this photo.



Lower Level Floor Plan, Herr Farm tobacco barn, Lancaster County. University of Delaware Center for Historic Architecture and Design.



Upper Level Floor Plan, Herr Farm tobacco barn, Lancaster County. University of Delaware Center for Historic Architecture and Design.



The vertical slats are open and the tobacco can be seen hanging just inside the door. The stripping room is in the far gable end.



Tobacco hanging inside a Lancaster County tobacco barn, 2003

Note the rails suspended in cleats; the extra laths; open slats; and the tiers of leaves.

### *Summer Kitchen, 1865-1920*

Throughout Pennsylvania in the late nineteenth and early twentieth centuries, farm families elaborated and diversified their diets. Of course rural people had long possessed numerous and subtle skills relating to food preparation and processing; but now newly available supplies and technologies reworked the possibilities. Orchards matured, garden patches expanded, products from far away became available, and to the old staples of corn mush, meat, and sauerkraut, farm families added more cakes, pies, preserves; made more poultry dishes; and slowly shifted away from pork to beef. There were several key ingredients to this change. One was the cook stove. Reliable, affordable coal-burning cook stoves were now far more widely available, just as the wood supply for traditional outdoor ovens diminished. As the cook stove replaced the open hearth and the outdoor bake oven, two important consequences followed. Cook stoves generated intense heat in the farm kitchen, so summertime cooking became difficult. Second, food preparation changed. More separate dishes could be prepared simultaneously. Expectations rose for dietary variety.

Another important change was in the increased availability of cheap sugar, produced on Caribbean and Latin American sugar plantations, and later US possessions in Puerto Rico and the Philippines. Consumption rose and the repertoire of jams, jellies, preserves, cakes, and puddings expanded.<sup>92</sup> Tropical fruits became available too. A recipe in the *Lancaster Farmer* for 1884, for example, explained how to make a "Cream Cake":

One teacup cream, two teacups sugar, three well-beaten eggs, teaspoon saleratus, dissolved in wineglass of milk, butter size half an egg, flour to make as thick as pound cake; add raisins and spice to taste; wine and brandy if you like.<sup>93</sup>

It is impossible to know how many people actually made "cream cake," but the instructions in themselves are revealing for what they assume about ingredients the farm wife might have on hand.

To accommodate the intensified subsistence activity, and to get the hot summertime cooking out of the house kitchen, more summer kitchens appeared. The summer kitchen was not a new building type, but it became more common in this period. The typical Lancaster County summer kitchen would be a small detached building, usually gabled and made of frame. It would have ample windows for light, at least one door for access, a stove, and sometimes a set-kettle for heavy work. It was usually very close to the main kitchen. Often a decorative cupola with dinner bell sat on the roof ridge. The summer kitchen facilitated increasingly complex and demanding women's productive work. The work was productive because it resulted in tangible articles to consume, sell, or trade. The summer kitchen's siting near the main house reflects its preeminence as primarily a women's space.



Summer kitchen, Rapho Township, Lancaster County, late 19th century. Pennsylvania Historic Preservation Bureau file photo.



“View of Enos Royer's farm with home garden in the foreground.”  
 Photographed by Sheldon Dick in 1938. The summer kitchen is strategically located between house and farm garden. FSA/OWI collection, Library of Congress. Digital ID fsa 8c02303 <http://>

*Poultry House, 1865-1920*

Small poultry house, Rapho Township, Lancaster County, c. 1920-1940.  
Pennsylvania Historic Preservation Bureau file photo.

The larger Lancaster Plain flocks required dedicated poultry housing. Lancaster County poultry houses from this period would still be modest in scale, but tailored to poultry raising and sometimes specialized to life cycle stage or type. Construction material would almost always be frame. Functionally, an early 20<sup>th</sup> century poultry house had some characteristic features. Usually it had either a shed roof or a gable roof. Windows across one eaves side afforded the light essential to chicken health. Small, hinged access doors, and ramps, allowed fowl to move in and out. Access doors for humans were placed either in the eaves side or in the gable end. Siting was usually between house and barn, especially for earlier structures; over time, poultry housing moved further from the house as men became more involved in the poultry business. It is important to note that farm families often improvised poultry housing, most notably by converting other buildings, usually by adding levels for nesting and perching, and cutting windows into previously solid walls. Smaller houses were frequently built on skids so that they could be moved.

The type of housing depended on the purpose. From the exterior, it is hard to tell a house intended for laying hens (layer house) from one where the occupants were destined to become meat (broiler house), so here, both types are treated together as generic “poultry houses.” Inside, a layer house would have perches and nesting boxes, but a broiler house would dispense with the nesting boxes, and thus be able to crowd more birds in the same square foot area. The influence of Penn State Extension and other elements of the agricultural establishment was notable.



Small poultry house, Christian and Emma Herr farm, West Lampeter Township, Lancaster County, date unknown.

CONSTRUCTION OF FARM BUILDINGS 195

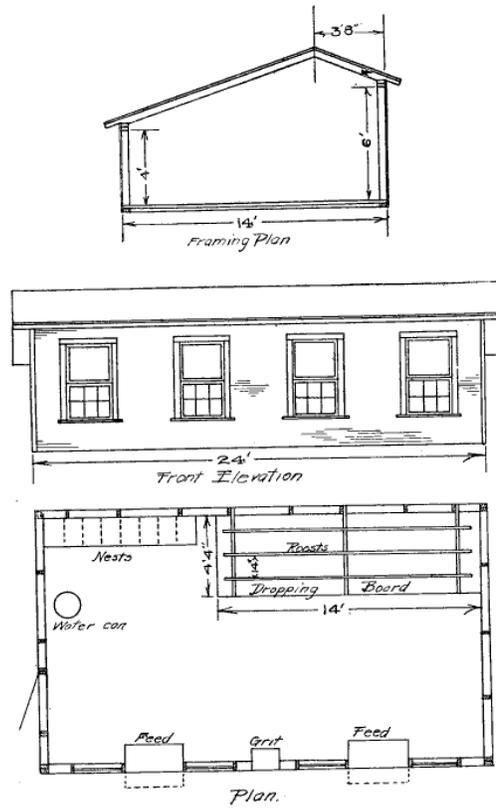


FIG. 89.—A poultry house for the average farm.

“Poultry House for the Average Farm.” Karl Ekblaw, Farm Structures, 1914, page 195.



“Lancaster County Pennsylvania rural scene.” This small Pennsylvania Barn has been turned into a poultry house. Photographed by Sheldon Dick in May 1938. FSA/OWI Collection, Library of Congress, Digital ID cph 3c37398 <http://hdl.loc.gov/loc.pnp/cph>.



“Rich Farmland, Lancaster County, PA.” Photographed by Marion Post Wolcott in 1939. FSA/OWI Collection, Library of Congress. Digital ID fsa 8c10444 <http://hdl.loc.gov/loc.pnp/fsa.8c10444> Probably the three-story building in center is a post 1920 poultry house, but the low shed roof one across the lane may be earlier.



“Barnyard on the farm of C.F. Minnich,” Lititz vicinity, Lancaster County. Photographed by Sheldon Dick in 1938. FSA/OWI Collection, Library of Congress. Digital ID fsa 8c02113 <http://hdl.loc.gov/loc.pnp/fsa.8c02113> It appears that the upper story is for chickens and the lower for hogs.

### *Machine Shed/Corn Crib, c 1865-1920*

Machine sheds housed farm equipment. In the heavily mechanized Lancaster Plain, they were numerous and substantial. Most were rectangular, some quite elongated. They could be enclosed, with large gable ends or eaves side doors to admit machinery; or they might be open on one eave side and enclosed on the other three sides. A machine shed might be combined with a corn crib, so that a drive-through roofed-over space was created between two corn cribs. In Lancaster and Lebanon Counties, machine sheds often had two levels; a lower, stone level housed machinery, and the upper level housed more machinery and ear corn. Machine sheds were most commonly built of light frame, covered over with horizontal or vertical board. They were sited nearer the barn than the house.



Corn barn with machine shed, Manor Township, Lancaster County late 19th century.



Drive through corncrib/machinery storage, Manheim Township, Lancaster County, c. 1880. Pennsylvania Historic Preservation Bureau file photo.



Drive through corn crib, New Holland Boro, Lancaster County, c. 1910-1940. Pennsylvania Historic Preservation Bureau file photo.

### *Greenhouse, c 1865-1920*

In the city and immediately adjacent to it, large greenhouses served truck farmers, and provided plants and flowers for ornamental use.<sup>94</sup>

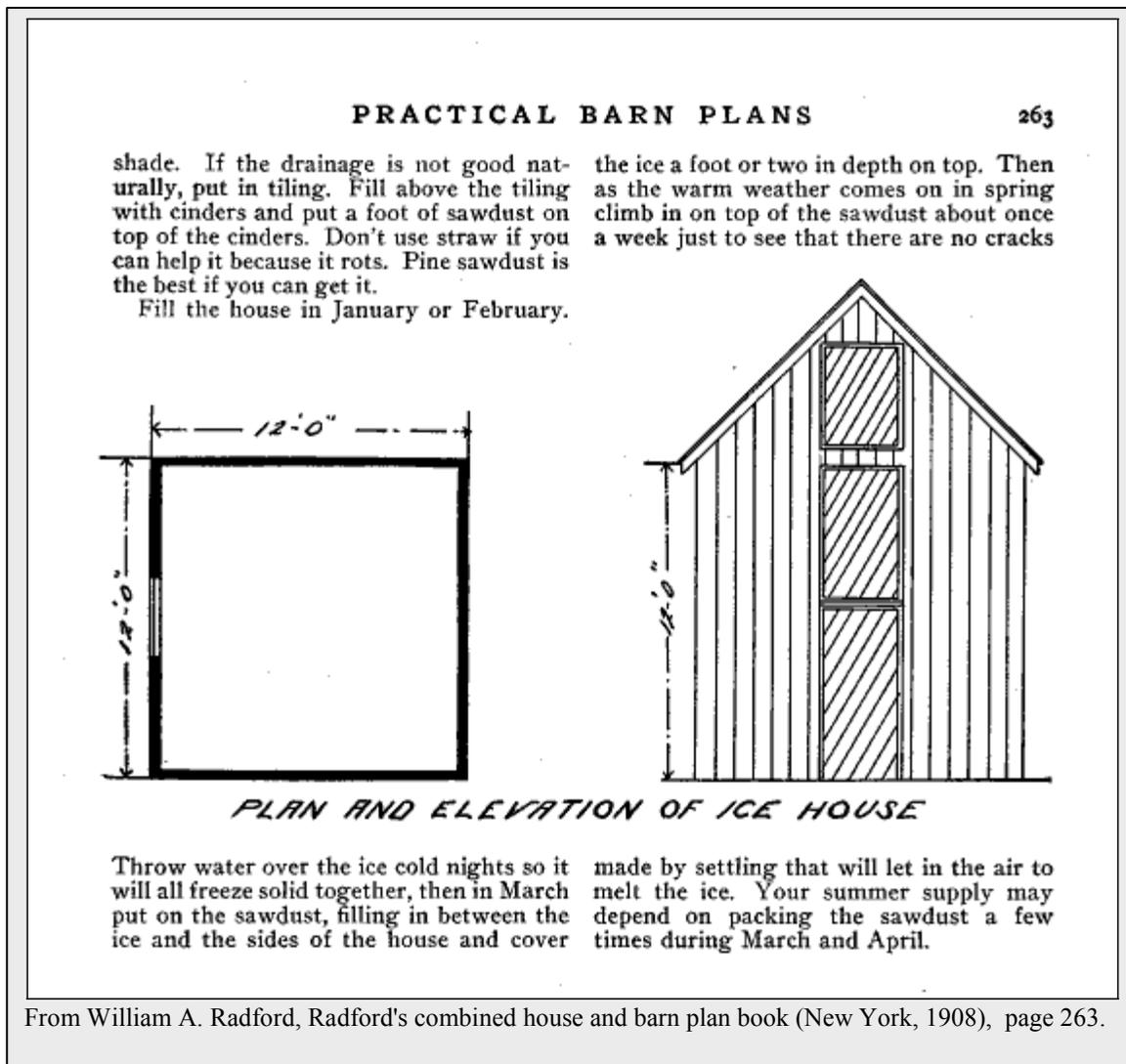
### *Windmill, c 1854-1920*

Farm windmills were principally used to pump water for livestock and for human use as well. They could also be connected to machinery that would grind animal feed, shell corn, cut straw, thresh grain, or saw boards. A number of companies (both local and out of state) made windmills in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. Most designs involved a three- or four-post tower surmounted with a wind-wheel and rudder assembly which turned as winds shifted, and which was connected to shafts to transfer energy to machinery. The height of the tower

determined the amount of power available. Windmills were sited near the barn or house, or in a pasture, or even protruding directly through a building roof. A turn of the century Lancaster County soil survey mentioned farm windmills; today they can sometimes be seen on Plain Sect farms.<sup>95</sup>

*Ice House, c 1865-1920*

Farm ice houses were useful conveniences in the era before mechanical refrigeration. H. M. Engle of Lancaster County wrote in 1882 that his ice house was constructed so it extended seven feet below ground level, and was insulated by sawdust. He noted that his ice house had “not been empty of ice in the last five or six years, and not in twenty years, except when we failed to get a supply for filling...” Ice was obtained in the winter by cutting from a pond.<sup>96</sup>



*Silo, c 1865-1920*

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 and palatable 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 19<sup>th</sup> century when the results of experiments in Europe became known. However, it did not become widespread until dairying was taken up more seriously.

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 (usually from a tier of doors from which silage was thrown down an exterior chute, which contained a ladder for access to the doors). Because masonry is inexpensive, durable, and clean, it became the norm; materials included concrete, special curved brick, and hollow glazed tile bricks. Metal (galvanized iron) was also used. Cement staves came into use after about 1910 and concrete in one form or another was the most popular until the advent of Harvestore silos in the later 20<sup>th</sup> century. Early silos were filled using conveyor belts; silo filling was a community activity. They were originally unloaded by hand, from the top. Later, Archimedes screw systems conveyed silage into the barn.

As Lancaster Plain farmers increased dairying activity, silos became more common. The Penn State agricultural extension agent reported in 1913 that "Quite a number of silos have been built this summer" on farms that raise both dairy and "fat cattle." The agent promoted ensilage enthusiastically and proudly noted by 1918 that more and more farmers were building them. By the mid 1920s Lancaster County did boast a higher than average percentage of farms with silos, though even then in only one township (Upper Leacock) did more than half the farms have one. On the Lancaster Plain, about a third of farms had silos.<sup>97</sup> Statewide, under twenty percent of farms had silos.



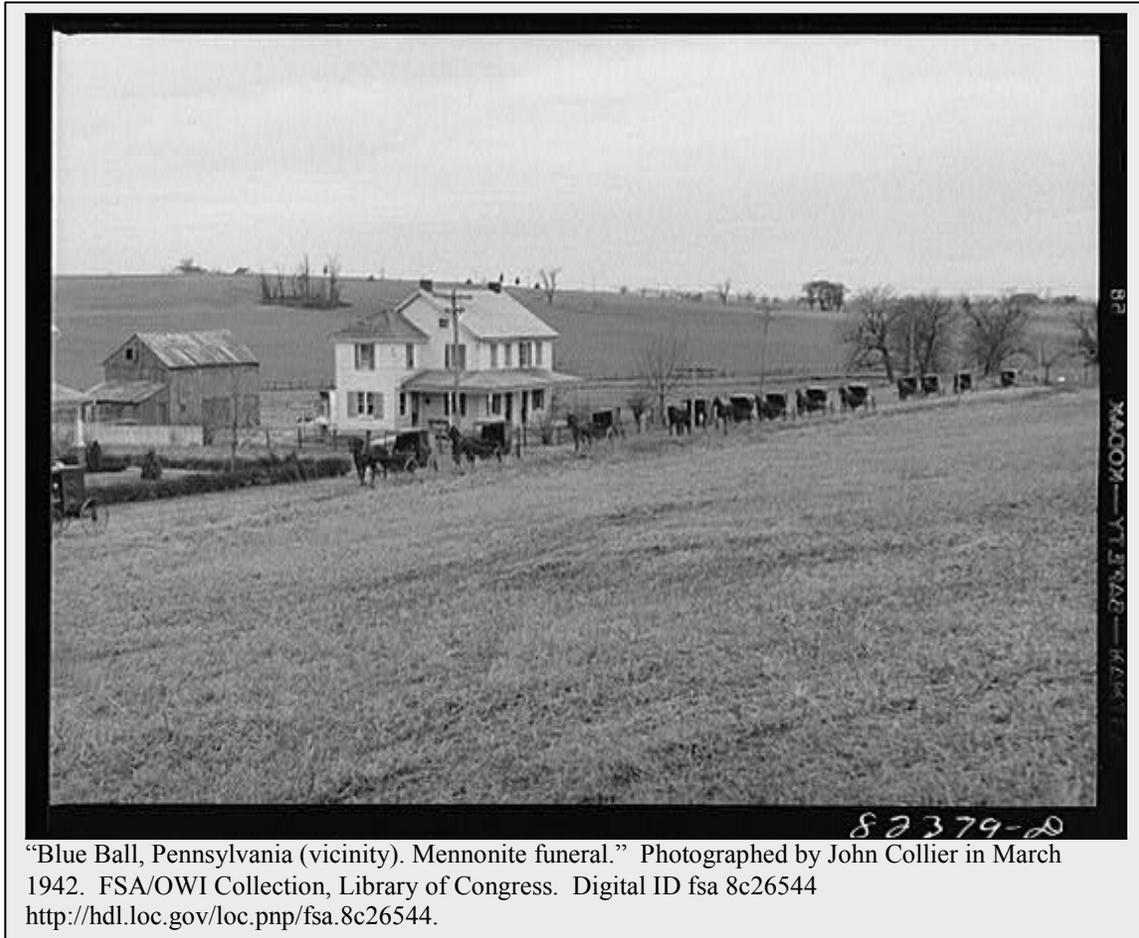
"Barn and Concrete Stave Silo of C. F. Minnich." Photographed by Sheldon Dick in 1938. FSA/OWI Collection, Library of Congress. Digital ID fsa 8c02111 <http://hdl.loc.gov/loc.pnp/fsa.8c02111>



### Landscape, 1865-1920

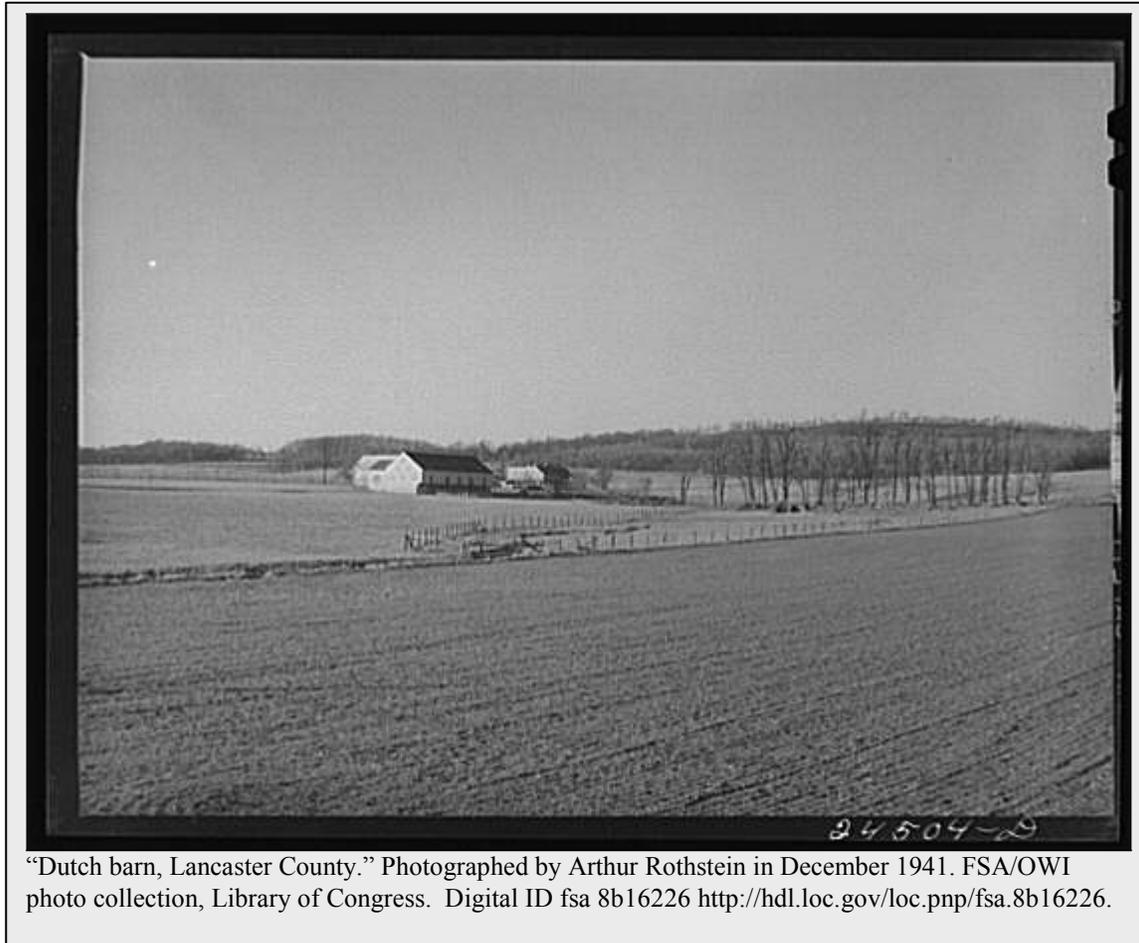
Even more than before, the Lancaster Plain had a wide-open character. Little land area was left un-exploited. One commentator found in 1894 a tidy landscape with “no weeds or bushes... all waste places are drained... nothing is left out in the weather to waste...” Early twentieth century observers remarked how pervasive were productive spaces-- farms stretched from fencerow to fencerow. While cropland still predominated, fenced pasture also was integral to the landscape. Barbed-wire fencing was in use by the early twentieth century; a local chronicler reminisced

about a hired man complaining that “a wire fence is no place for a hard-working hired man to be resting.”<sup>98</sup> The walled barnyard enclosure remained on many farms. Forest was disappearing, and this raised concerns about erosion and wind protection.<sup>99</sup>



“Blue Ball, Pennsylvania (vicinity). Mennonite funeral.” Photographed by John Collier in March 1942. FSA/OWI Collection, Library of Congress. Digital ID fsa 8c26544  
<http://hdl.loc.gov/loc.pnp/fsa.8c26544>.

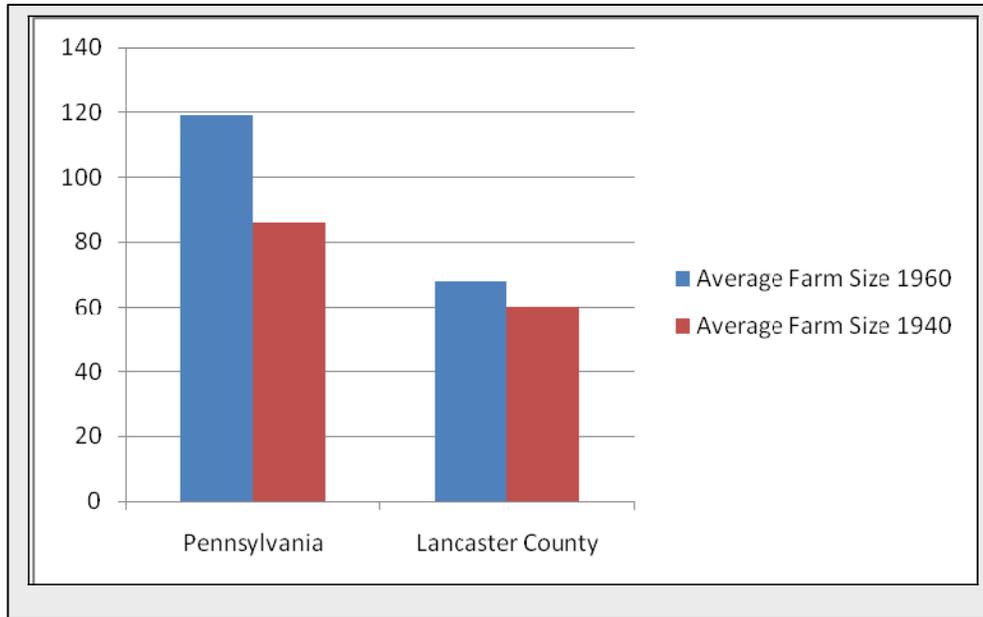
The image shows several notable landscape features. The hedge just visible at left probably post dates 1920, but c. 1914 images show utility poles, and the landscape would have had this same open character in the early 20<sup>th</sup> century.



“Dutch barn, Lancaster County.” Photographed by Arthur Rothstein in December 1941. FSA/OWI photo collection, Library of Congress. Digital ID fsa 8b16226 <http://hdl.loc.gov/loc.pnp/fsa.8b16226>.

This photo shows a treeline, and a fence (probably barbed wire) enclosing a pasture and stream.

## Livestock, Tobacco, Truck Farming, and Poultry, c 1920-1960



Even the “banner county” was susceptible to agricultural depression. The number of farms in the county peaked sometime around 1925, when the census recorded 11,457 farms; but after that, every census year showed a decline. By 1950 there were 7,952 farms in the county, a loss of 3,500 from the 1925 peak.<sup>100</sup> Average farm size rose, but not in strict lockstep with the decline

in farm numbers, because the total amount of farmland in the county had been on the decline since 1880. In 1950 the average Lancaster County farm still had only 62 acres. Rural to urban migration drained the countryside during the Depression and war years; thereafter development began to bring new pressures.<sup>101</sup> Lancaster County agriculture in this period developed against a darkening background.

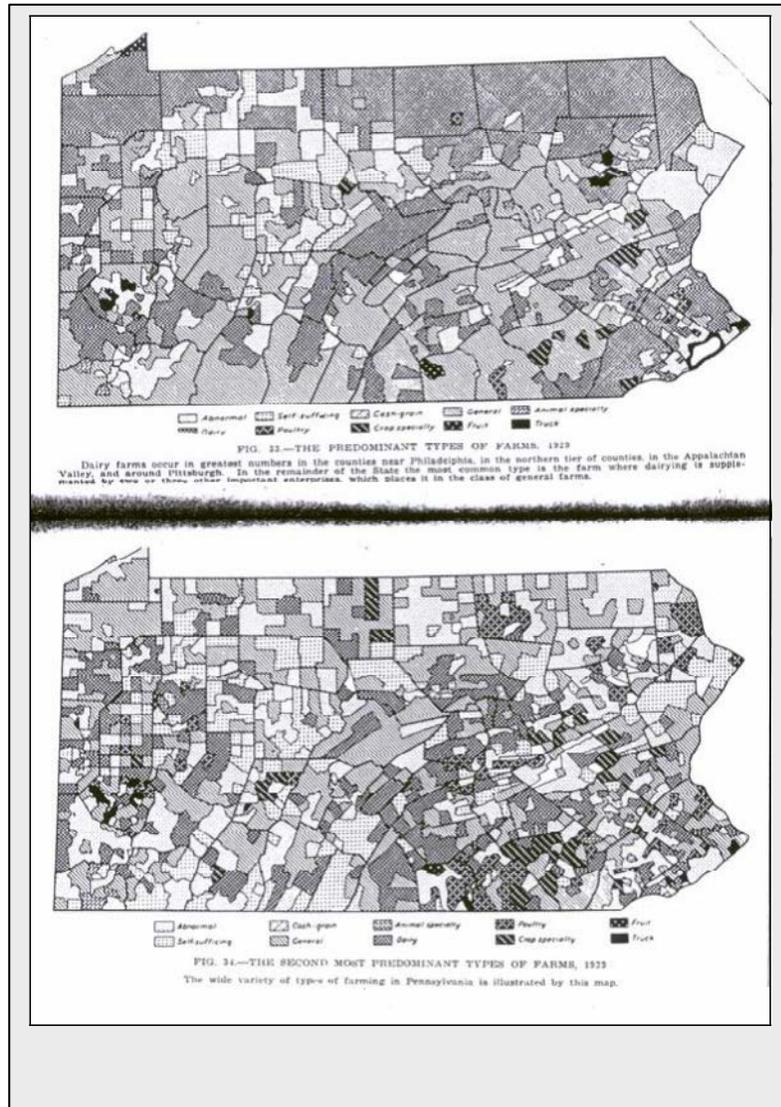
### Products, 1920-1960

Overview: During this period, Lancaster Plain farming families continued with a basic crop and livestock structure, but altered it in significant ways. Farm families had to adjust to stay in

business. In general, as elsewhere, Lancaster Plain farms yielded “fewer sources of income” during this period.<sup>102</sup> Census figures are not available down to the township level after 1927, so much of the discussion below relies on countywide census data combined with specialized studies to make inferences about the Lancaster Plain.

In crop production, Lancaster County still stood among state leaders in overall totals (and often in per-farm averages also) for grain corn, silage corn, hay, wheat, barley, and tobacco. Tobacco production fluctuated. In 1950 (the latest year for which figures are available), it was lower than the peak year of 1920. Yet in 1950 tobacco was still a major income generator at 45 million pounds for the county as a whole (really only for the townships in the Plain), on about 31,000 acres. To some extent, vegetable growing and commercial nursery operations made up for the lost tobacco acreage. For most field crops, hybrid or improved seed combined with chemical fertilizers to boost per-acre productivity.<sup>103</sup> The proportion of total farm land area in crops was still high – 70 percent in 1950 (statewide it was 48 percent). Orchards declined; other regions could more profitably produce fruit, and Lancaster County farmers got out of the orchard business.

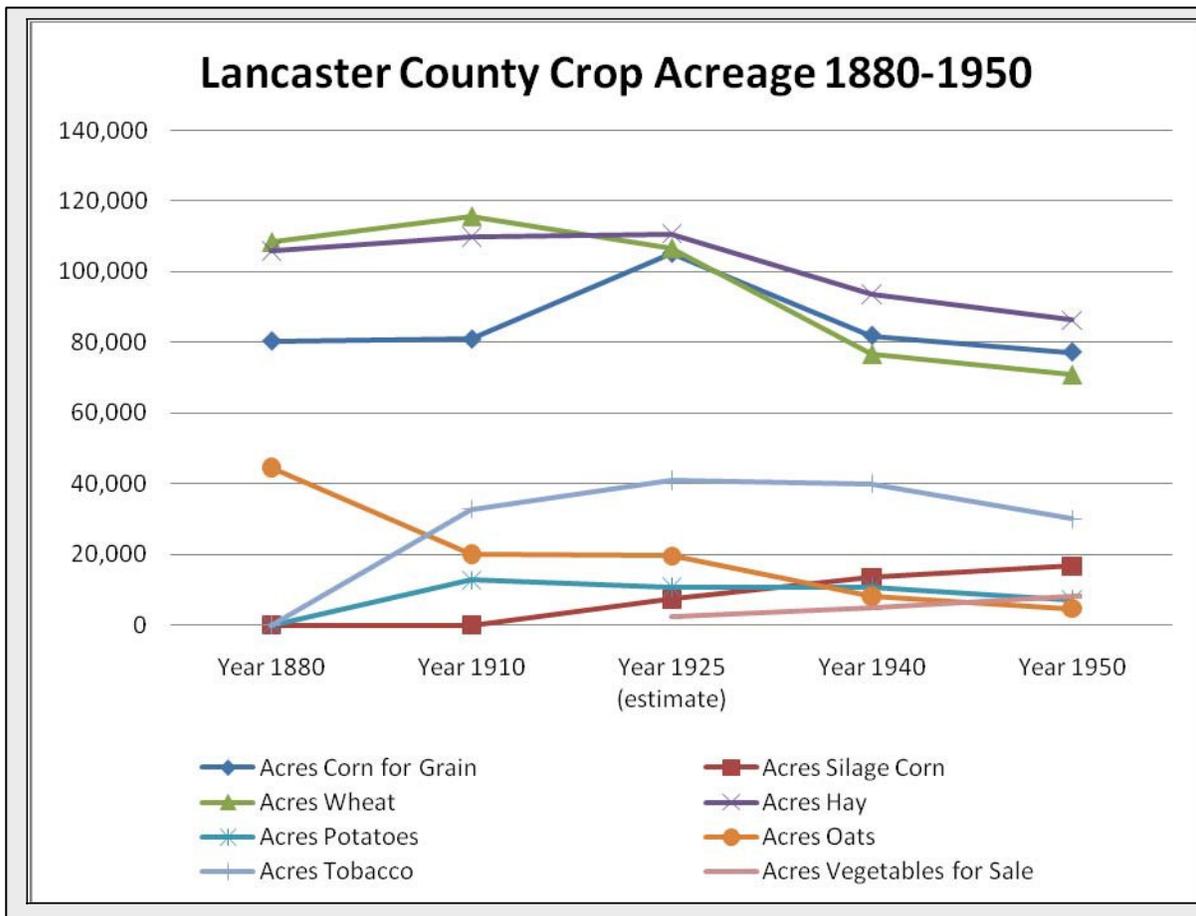
Where livestock were concerned, hogs fluctuated in total numbers, mostly declining but rebounding briefly between 1940 and 1950. Dairy cattle numbers increased modestly in the county as a whole, but dairying was still more important outside the Lancaster Plain. Chicken numbers boomed. The number of horses declined; see the discussion under “labor and land tenure” for more details. Beef cattle feeding, in conjunction with tobacco farming, continued to its central role in Lancaster Plain farming.<sup>104</sup>



The chart shows how difficult it was to characterize Lancaster County farms, even as late as 1950. “General” farms made up the single biggest group. “Miscellaneous or unclassified” farms also accounted for a significant percentage. According to the definition, the only type these could have been in Lancaster County would be flower nurseries, but it is difficult to believe they would account for such a large portion of farms. Since truck farms sold small quantities of many products, they probably fall between the cracks of this categorization system.

Types of Farming map. “Types of Farming in Pennsylvania,” Pennsylvania State College Agricultural Experiment Station Bulletin # 305 (April 1934), 46-7. This map shows 1929 types of farming down to the township level. Note that the Lancaster Plain had mainly crop-specialty (i.e. tobacco) farms or general farms, while dairying in the county was concentrated outside the Plain.

Specific Products:



Crops changed in their proportions, but the chart above suggests that the traditional crops retained their importance. This was partly because they continued to play multiple roles. During the Depression, for example, low wheat prices led farmers to use wheat as a feed crop for poultry

and even hogs.<sup>105</sup> Steer feeders valued “straw and standability.”<sup>106</sup> When the combine appeared, the need for strong stalks became even greater. Wheat also served as a nurse crop in rotations. Lancaster County farmers often raised wheat for seed, especially the “Pennsylvania 44” variety.<sup>107</sup> Winter barley performed similar functions, serving not only as livestock feed but as straw source and as nurse crop for alfalfa and clover.<sup>108</sup> Oats production declined and became insignificant; other regions were much better suited to oats, and in any case horse numbers were also on the decline.<sup>109</sup>

Corn yields and uses changed during this period. Corn acreage increased significantly between 1910 and 1925, precisely the years when dairying became more important in Lancaster Plain farming strategies. Early in the twentieth century, Lancaster Sure Crop corn, a locally developed open-pollinated variety, achieved popularity. It was valued for “early maturity, disease resistance, ease of harvest and uniformity.”<sup>110</sup> Yields fluctuated as always, because of weather vagaries. Another important development in the period was hybrid corn. Hybrid varieties first came to the agricultural extension agent’s attention in the late 1930s; Lancaster County farmers embraced them enthusiastically and by 1940 the agent claimed that seventy percent of county farmers had switched over.<sup>111</sup> Hybrid corn had several important implications. Yields were higher with hybrids; hybrids lent themselves better to mechanized harvesting, thus encouraging further mechanization; and hybrids cemented farmers’ dependency on seed companies, since farmers themselves could no longer save seed for the coming crop year. Hybrids also produced best with heavy applications of purchased fertilizer, further requiring cash inputs.

Silage corn acreage increased to 7,200 in 1925. This was still less than ten percent of the total corn acreage planted that year, but silage corn acreage kept rising and soon silage was well established. Ensilage provided high quality winter feed for cattle, mainly for dairy cows, but also for beef animals. It facilitated year-round milking and so brought significant changes to farm routines.

Vegetable production increased significantly and attracted attention from the agricultural extension agents. Like tobacco, truck crops took up relatively little acreage on a given farm; unlike tobacco growing, truck farming was practiced by relatively few farmers. But the high-value crops produced made it disproportionately important to farm economic strategies. There was much diversity in truck crops. In the 1920s, for example, many farms raised sweet corn for drying, probably meeting a local market demand from Pennsylvania Germans, who used dried sweet corn in favorite Pennsylvania German dishes. In 1925 the

extension agent noted: “the dehydrating of sweet corn on a commercial scale in six communities of the county has assumed such proportions that it now assumes a place of note in our agricultural scheme as a money crop.”<sup>112</sup> Extension agents also helped with variety selection for tomatoes, peas, cabbage, cauliflower, carrots, celery, beets, limas, snap beans, and lettuce. Washington Boro enjoyed a microclimate that permitted early tomato harvest, and the area became a local center for tomato raising.<sup>113</sup> Local canneries multiplied and many farmers sent their vegetables there for processing. Small fruits, such as blackberries, blueberries, and raspberries, became popular.<sup>114</sup> By the 1940s, the emerging highway transport system threatened local truck farmers, because it brought in cheap California and Florida produce. However, local vegetable growers also used the highway network to raise vegetables for freezing and distribution to the eastern seaboard and as far west as Chicago.<sup>115</sup>

Though distant markets assumed an important role, local markets for farm produce continued as a strong presence in Lancaster County.<sup>116</sup>

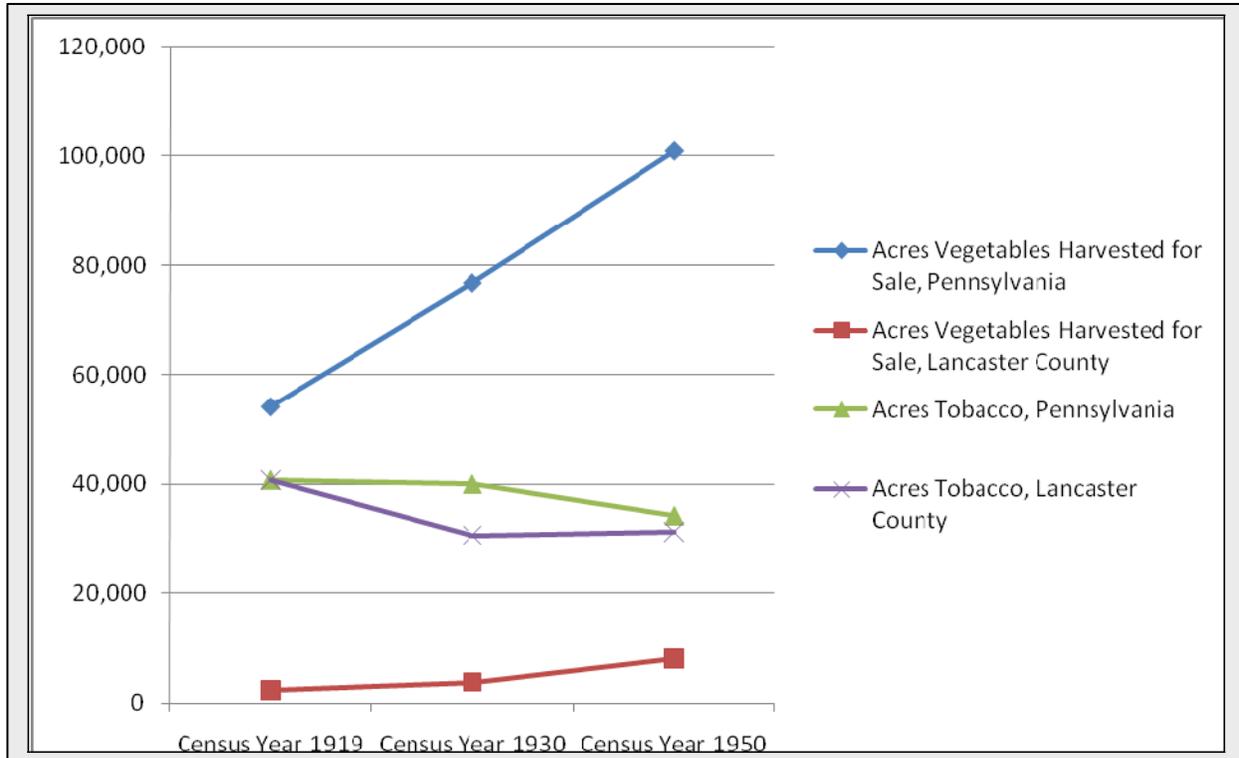


This image shows a Lititz, Pennsylvania Mennonite farmer's wife at the farmers' market. Photographed by Marjory Collins in November 1942. FSA/OWI Collection, Library of Congress. Digital ID fsa 8d23478.

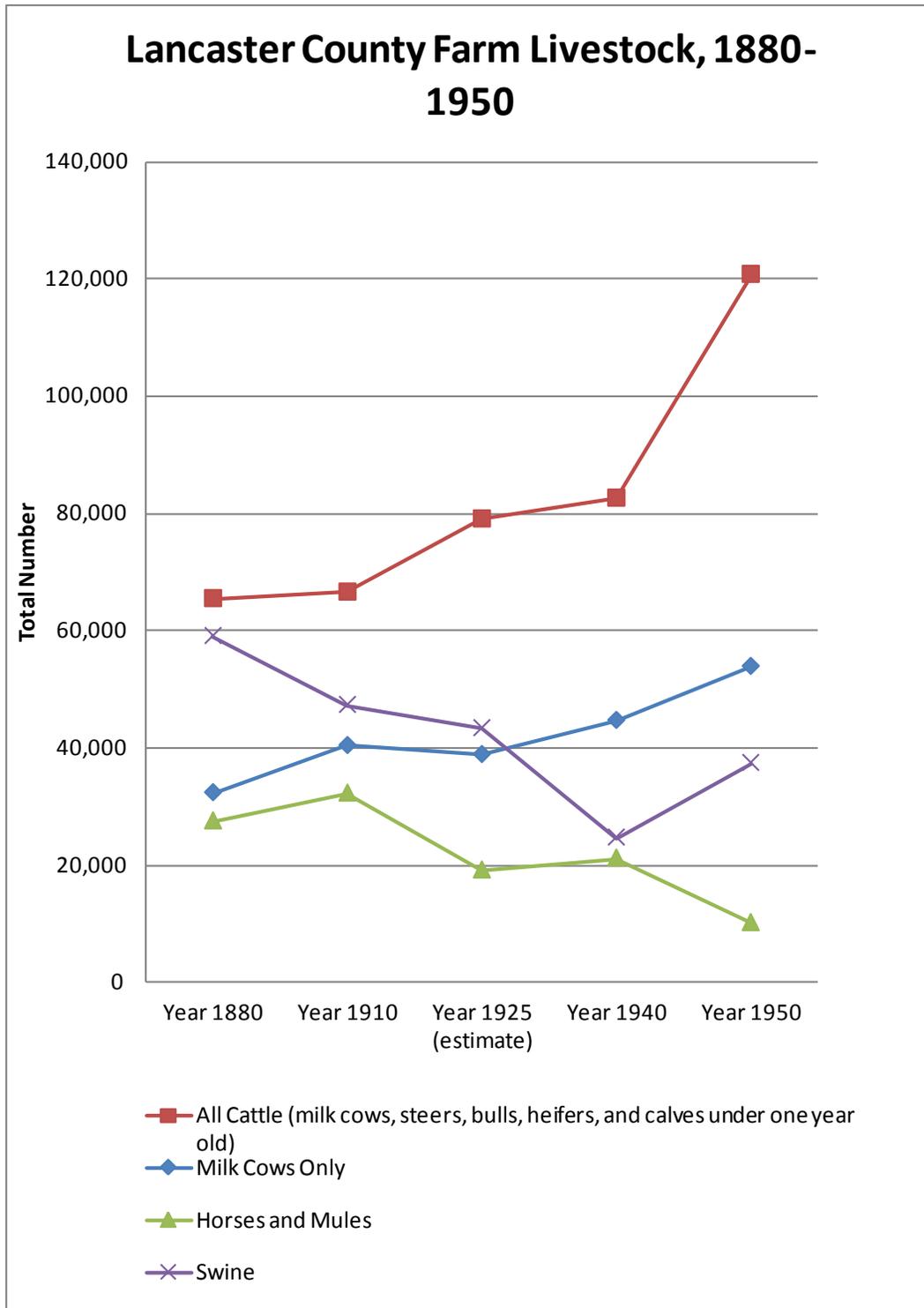
Another specialty was commercial flower production. We have seen that greenhouse businesses flourished before 1920, and this trend continued. Two local trade associations supported the industry. By 1955, the agricultural extension agent could report that Lancaster was the top ranking flower county in Pennsylvania, boasting 1.5 million square feet of greenhouse space. Carnations, chrysanthemums, roses, snapdragons, and various other plants and shrubs were grown.<sup>117</sup> This business was another typical Lancaster Plain adaptation: it could be pursued on small acreage, it generated high per-acre profits, and it benefited from highly skilled local agricultural labor force.

Tobacco still anchored the Lancaster Plain farming economy. While total production had dipped, cigar leaf still accounted for \$12 million in sales in 1950. A thorough study examining the “Agricultural Geography of Cigar Tobacco” in Lancaster County cast the years between 1919 and 1949 as a period of “consolidation” in the business. Expansion ceased, but stability prevailed. Innovations in disease control, marketing, and mechanization resulted in greater productivity and profit. Traditional rotations of tobacco: winter wheat: hay (clover and timothy): and field corn continued. The author, Roger Heppell, noted some important features of the tobacco farming system. For example, tomatoes were “seldom found on tobacco farms,” since the two competed directly for labor and other resources. Heppell thought that potatoes were a popular crop in tobacco regions, but the overall potato acreage was flat.<sup>118</sup> USDA researchers thought that tobacco farmers were beginning to use more purchased fertilizers.<sup>119</sup>

Heppell made the important point that dairying was not as prevalent in the tobacco regions as elsewhere. Dairy operations were not absent from the Plain, but dairy herds were small herds numbering five to ten animals. This was for several reasons. Most important was labor: dairy cows, according to Heppell, took 154 hours of “man-labor” per year, and steers only 12. Another serious drawback to combining dairying with tobacco farming was that since dairy cows were still being pastured at this point, manure collection was not feasible. Poultry farming and tobacco farming did coexist, according to Heppell; but the larger scale poultry farms also tended to be located outside of the Lancaster Plain. Again, it seems that labor allocation and manure must account for this pattern, because Heppell estimates that poultry took up 2.7 “man-hours” of work per year per hen, a significant commitment. Moreover, poultry manure was regarded as inappropriate for tobacco growing.<sup>120</sup>



This graph, based on US Census data, shows two important facts. First, acreage of vegetables for sale did increase in Lancaster County, but not as fast as it did elsewhere in the state; and the acreage of vegetables added between 1919 and 1950 (about 8,000) roughly corresponded to the acreage of tobacco lost during that same period (roughly 9,000). In money terms, truck crops and tobacco were both high value crops per acre.



Lancaster County livestock, 1880, 1910, 1925, 1940, and 1950.

In the dairy business, fluid milk was now essentially the only dairy product; farm-made butter was fast disappearing. Per-cow productivity increased with new breeding and feeding practices, and soon a milk glut resulted in low prices and struggles for dairy families. These changes occurred everywhere, but in Lancaster Plain dairying they are not the biggest story.

The county agricultural extension agent's annual reports suggest that a distinctive pattern characterized twentieth-century dairying in the county. Throughout the 1920s, 1930s, and even into the mid 1940s, conflicts over tuberculin testing appear to have significantly influenced dairy development in Lancaster County and more especially on the Lancaster Plain. Bovine tuberculosis eradication had emerged as a key goal for municipal, state, and federal governments after new scientific discoveries confirmed that the pathogen responsible for the disease in cattle also could infect humans. Soon efficient testing techniques were developed, followed by concentrated testing strategies focusing initially on breeding stock and later proceeding on a geographic ("area") basis. These were underpinned by federal and state appropriations for testing and indemnities.<sup>121</sup>

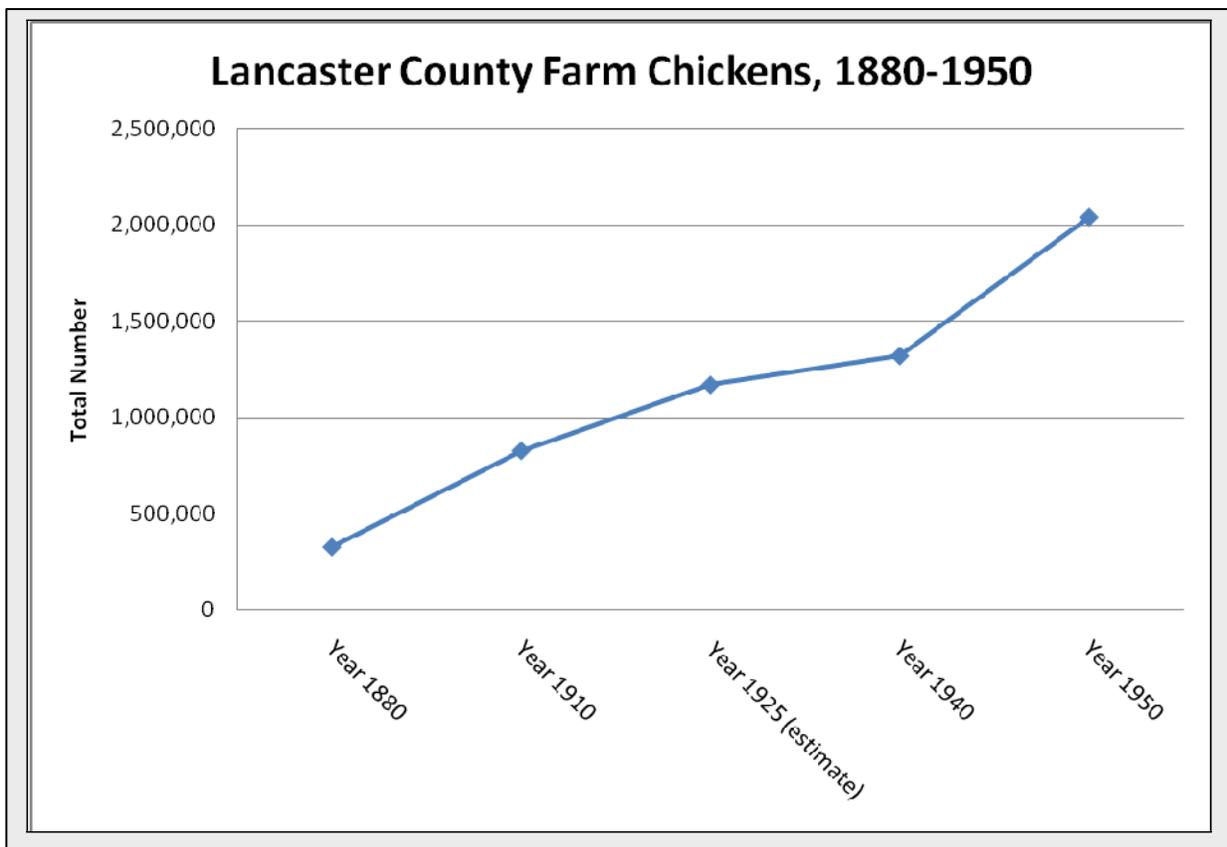
In Lancaster County, the matter first surfaced in the agent's 1926 report when he wrote that bovine tuberculosis had killed many cattle in the county. The epidemic, he wrote, "coupled with the activities of a few anti-testing advocates was sufficient to fan the flames of one of the most power agricultural upheavals that we have ever known in this county." This was the formation of the Farmers Protective Association, "an organization of about 800 farmers whose avowed purpose is to fight tuberculin testing in this county and particularly the Board of Health of Lancaster City which board has sponsored a city ordinance requiring all raw milk sold in the city to be tuberculin tested." The agent claimed that the organization successfully prevented other farmers from having their cows tested. Yet their competitive position suffered in the end, because "the county witnessed a very heavy importation of tested cattle." It seems that the Plain was the epicenter of this disturbance since in 1929 the agent wrote that most of the opposition emanated from the Lancaster city vicinity. Throughout the 1930s anti-testing farmers waged a protracted battle with municipal authorities both in Lancaster and other markets such as Philadelphia. The agent noted that a good many Lancaster County farmers chose to take lower prices from "untested" or "less demanding" (1932) markets rather than meet sanitation requirements imposed by more lucrative markets. For example, the Hershey Company accepted lower-grade milk for its candy making process. As these "cheaper" markets became less numerous, though, the choices were fewer.<sup>122</sup>

Against the background of efforts to eradicate bovine TB, Lancaster County's protracted opposition stands out. Lancaster County farmers were not the only ones to protest, but they resisted longer than most.<sup>123</sup> In fact, a Lancaster County farmer, Christian S. King, became the very last farmer in the state to have his herd tested, in 1935; the following year, the USDA certified all of Pennsylvania as an "accredited area in bovine tuberculosis eradication..."<sup>124</sup> To be sure, many Lancaster County dairy farm families did comply with testing regulations, and they modernized their farm plants in accordance with strict requirements. However, resistance seems to have had a noticeable impact. To the agent, the apostle of progressive and scientific agriculture, resistance was exasperating and irrational. But, according to Stevenson Fletcher, many farmers regarded the new regulations as intrusive violations of private property rights. Indemnification was not an issue; a strong compensation program compensated for animals that tested positive. But conservative Lancaster County farmers still resented what they regarded as unreasonable "search and seizure." The courts, however, supported the testing laws, interpreting them as an "abatement of a public nuisance."<sup>125</sup>

Though bovine TB also affected livestock kept for beef, eradication efforts focused on dairy cows, and perhaps we should consider continued beef feeding partially as borne of an aversion to dairy sanitation requirements. In addition to issues with dairy cow testing, labor demands were much greater in dairying, so when labor was scarce, stock feeding was a rational alternative. In the early 1950s, for example, high labor prices combined with high prices received for beef animals to spur some dairy farmers to convert to beef feeding. Stall feeding and tobacco growing still went hand in hand; tobacco acreage actually rose slightly between 1930 and 1950 period. Heppell estimated that tobacco farmers raised seven or eight steers per season.<sup>126</sup>

Stock feeding in the twentieth century followed some longstanding customs, and departed from tradition in other respects. As before, cattle were not born and raised on the farm, but purchased from elsewhere for fattening and 'finishing.' The April 20, 1956, issue of *Lancaster Farming* noted that "there have been times when farmers in our county feed more steers for slaughter than in any other county in the US, even though we do not raise beef cattle." The US agricultural census indicates that 6,900 of Lancaster's 7,952 farms purchased cattle and/or poultry in 1950. This practice reflected historic patterns of geographic distribution; cheaper western pasture lands were used to raise young animals, then they were shipped further east toward market centers for fattening. One important change was that purchased feed played a much larger role than in the past. Though Lancaster County farms still produced hay, corn, and other feeds on the farm, the evidence suggests that feed generated on the farm was inadequate. The US Census for 1950

reported feed expenditures for Lancaster County to the tune of over \$20 million. This included feed for both cattle and poultry, but no matter how the numbers might be divided, this is a staggering figure amounting to nearly \$3,000 per farm. Roger Heppell wrote: “most steer feed is produced locally. Characteristically, all the corn, hay, and straw are utilized on the farm, while concentrates, chiefly cottonseed, linseed, and soybean meal, bran, and sometimes more corn, are purchased in large quantity.”<sup>127</sup> No longer could farms recycle nutrients in a closed system. It is not possible to know where the purchased feed originated, but at least some must have come from outside the county. The implications are significant even if not entirely clear. It seems that once feed and fertilizer came from off the farm, conditions were developing for nutrient surpluses that today cause major environmental problems in the region.



Poultry raising was already important by 1920, but thereafter poultry numbers rose even more sharply, especially between 1940 and 1950. Major changes shaped the poultry business during these years. It was undertaken on a much larger scale, so more capital was invested and more scientific management principles applied. More men entered the poultry business, though usually farm women made important if unacknowledged contributions. Chickens were raised for

meat and eggs, and a few families raised chicks as a specialty. By 1950 the census figures for that year show over 2 million chickens in the county, easily the largest number in the state. They produced nearly 20 million dozen eggs, or about 2,500 dozen per farm. The overall impression is that Lancaster County was overrun with chickens. As before, Lancaster Plain farming families had adapted to changing conditions by turning to an enterprise that could be pursued on small acreage, fit with traditional practices, and generated reasonable profits. Poultry production took a high place in the agricultural extension agency's priority list. Agents pushed for better "quality of flocks" through record keeping and culling the notorious "boarder hen" (the bird who ate more food than she was worth). Housing was an important focus; it is discussed in the section on buildings. By the 1930s, the extension reports assume that poultry producers purchased at least some feed, and local suppliers developed thriving feed businesses.<sup>128</sup>

Hog raising in general became less popular during this period as low prices discouraged farmers. However, numbers turned back upwards in the 1940s. Extension agent reports suggest that hog feeding moved in parallel with steer feeding; in 1956, for example, the agent explained how the two literally went together: "many steer feeders add to this population [of swine] by running the hogs with their steers in order to reduce the loss of feed and grain nutrients."<sup>129</sup>

Subsistence strategies continued to hold an important place in Lancaster Plain rural life. The 1935 Home Economics Extension agent noted: "It was estimated by a farmer in the Dutch and Amish homes 500 to 1000 jars of fruits, vegetables, meats, chicken, and rabbit were preserved besides an unlimited quantity of apple butter, preserves, jams, jellies and pickles, chowchow and sourkraut." By 1938 the agent wrote: "These women can all they grow and do not keep a canning budget. In asking about the number of jars canned they report they can from 300 to 800 quarts of fruit and vegetables and meats. More are using the freezing lockers for meat and poultry." "Freezing lockers" were public facilities renting out space. Canneries also opened their facilities to farm families. During World War II women reportedly increased their canning total threefold. By the end of the war, home freezing began to replace canning. In 1950, nearly a third of Lancaster County farms reported having an electric home freezer.<sup>130</sup>

### Labor and Land Tenure, 1920-1960

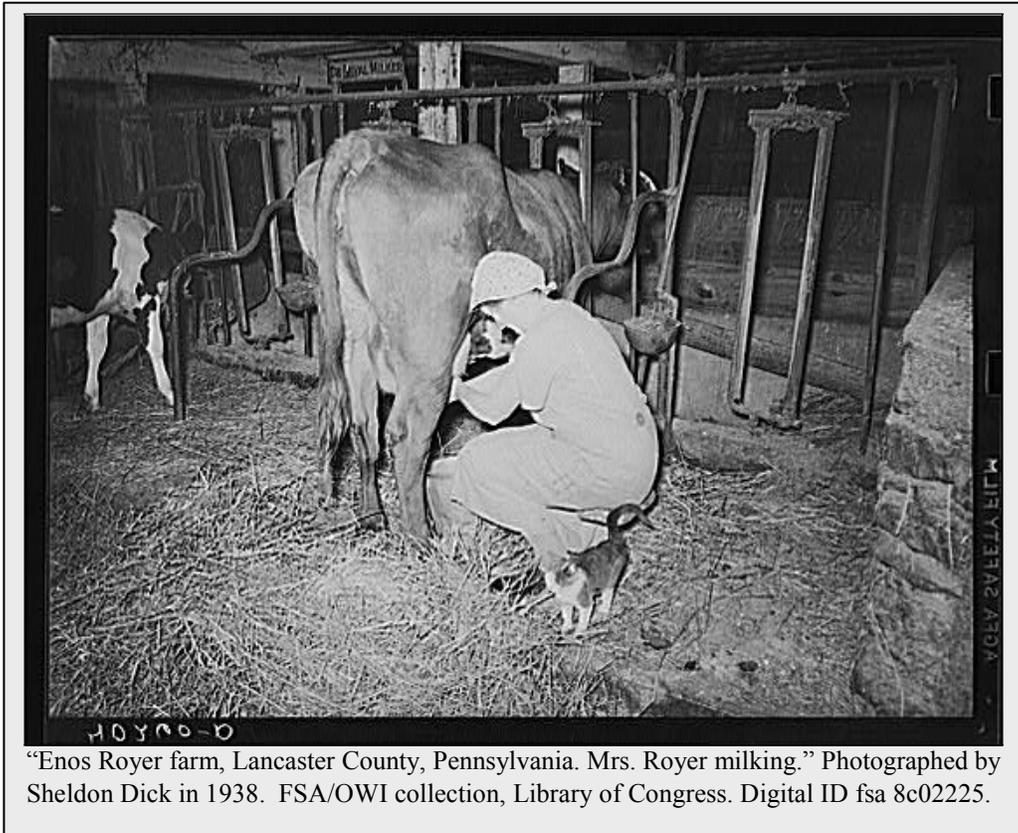
The decisive shift from horse to tractor farming occurred between 1940 and 1950, when the number of horses dropped by half (21,000 to 10,000) and tractors went from 3,400 to over 9,000. Yet only 5,345 farms (of 7,952) reported tractors. This must mean that tractor farming was unevenly distributed: farms with tractors often had more than one, and over 2,000 farms had no tractor at all. Lest we hasten to conclude that this disparity reflects Plain Sect farm operations, we should note that tractors did not always make economic sense on small Lancaster County farms.<sup>131</sup> Moreover, throughout Pennsylvania in 1950 many farms still lacked tractors. For example, in Bradford County, where there were virtually no Plain Sect farms, there were 3,741 farms and only 2,500 of them reported tractors. Tractor *use* may have been more widespread than ownership, but nonetheless it is clear that the shift away from horse farming simply took a long time.

A 1929 farm machinery survey noted the following popular equipment in Lancaster County: walking plows; disk harrows; grain drills; corn planters; dump rakes; corn shellers; feed grinders; manure spreaders; and tobacco planters. Indeed, by the 1950s machinery surpassed land as the primary capital expenditure.<sup>132</sup>

In Lancaster County for this period, rather than picturing a stark divide between “mainstream” and Plain Sect approaches to agriculture, it is more accurate to think in terms of a spectrum. The most modernized farming practices and most conservative Old Order ways now diverged considerably, but there was still a good deal of common ground between the two poles. For example, not only were many “mainstream” farms still horse-powered, and many non-Amish farm families lacking plumbing and electricity, but all social groups raised tobacco, grains, livestock, vegetables, and hay. As the dispute over cow testing shows, “mainstream” Pennsylvania Germans often shared some conservative social values with their Plain Sect neighbors.

Demographically the Amish presence was still small. As of the 1930s, there were still probably fewer than 3,000 Old Order Amish people (individuals, not households) altogether in the county, not nearly enough to account for 9,000 farms. Other Plain Sect groups would have swelled the total, but still not enough to influence the overall contours of agriculture in the county. The Amish were imagined in a cultural process that took place among mainstream Americans and other Pennsylvania Germans. For some, they represented backwardness and intolerance; for others, simplicity and piety. These characterizations had little to do with Amish people themselves, and much to do with modernization and its attendant anxieties.<sup>133</sup>

Farm labor patterns showed both continuities and changes during this period. Family members continued as the main labor source. The 1950 agricultural census listed a total of 14,491 workers on Lancaster County farms; only 2,276 farms reported hired labor, totaling 3,567 people. Family therefore accounted for 10,922 of the 14,491 farm workers in the county (75%).



“Enos Royer farm, Lancaster County, Pennsylvania. Mrs. Royer milking.” Photographed by Sheldon Dick in 1938. FSA/OWI collection, Library of Congress. Digital ID fsa 8c02225.

The agricultural extension agent noted a trend toward part-time farming in the 1950s. Statistics from a questionnaire showed that fifty percent of Lancaster County farmers “do some work off their farm.” Their farms often had poultry, beef, or dairy enterprises. The agent report continued: “almost all part-time farmers are full owners, but, on the average, they have smaller farm units than full-time farmers. ...most [...] have been working regular daylight hours at a laboring type of job.” The agent found positives in the practice: “the off-farm job serves as a source of economic security. They feel fairly well off compared with full-time farmers or other workers in industry.”<sup>134</sup> The report did not note whether farm women took off-farm jobs.

On the farm, though, women continued to play a key role. The home economics extension agent in 1958 noted that “rural women of Lancaster County do spend a great amount of time assisting with farm work; they help plant, cultivate, cut and strip the tobacco, as well as assist with the garden and poultry.”<sup>135</sup>

But even so, during the war years and afterward, farm labor scarcity forced growers to add non-family workers. Wage laborers had always been integral to farming here; they had long been recruited locally. But local farmers began to complain that “school children, as a whole, are no longer willing to work for wages the farmer can afford to pay,” and that farm hands no longer were willing to do hard tobacco work: “all hired help wants to do,” went one complaint, “is drive the tractor.” During the war, prisoners of war, Jamaicans, African Americans, and Puerto Ricans worked on Lancaster County farms. After the war, labor shortages persisted and more non-local workers stayed in the Lancaster County fields. Spanish speaking people gained a foothold; many settled in the cities and formed new ethnic communities.<sup>136</sup>



This c. “Lancaster County, Pennsylvania. Enos Royer and hired hands having dinner on the Enos Royer farm.” Photographed by Sheldon Dick in 1938. FSA/OWI collection, Library of Congress. Digital ID fsa 8c02294.

Farm tenancy also continued. The county agent, in fact, analyzed account books throughout the 1920s and 1930s to conclude that tenants actually had higher labor incomes than did farm owners, mainly because owners had higher taxes, mortgages, and the like. In the long run, though, tenancy rates declined.

### **Buildings and Landscapes, 1920-1960**

#### *Farm House, 1920-1960*

Schneider, *Foundations in a Fertile Soil*, notes that new farm housing in this period infrequently drew from current styles such as the Craftsman style, and that some built using new materials such as “patterned block” (such as rock-face concrete block).

#### *Barns, 1920-1960*

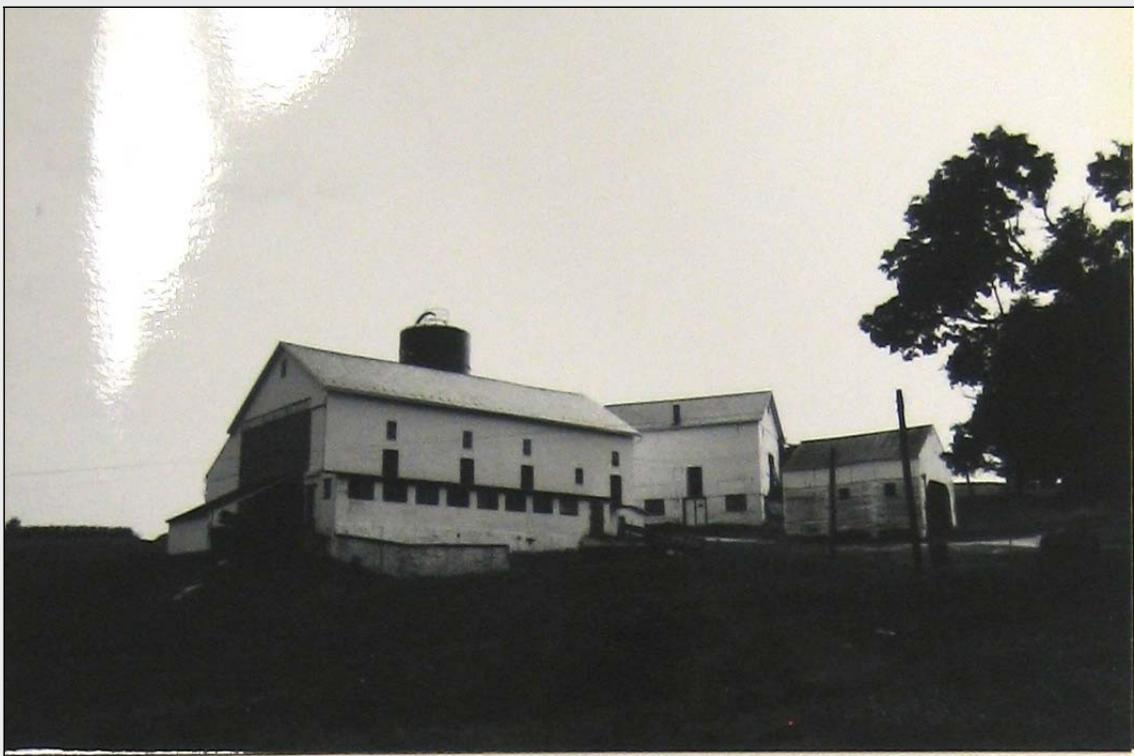
Thousands of older Pennsylvania Barns continued in service. On the Lancaster Plain in particular, they still suited the farm economy in many cases, because the old stall feeding and tobacco growing regime had survived reasonably intact. Nonetheless, new barn types began to supplant the old favorite during these years, and pressures mounted for thoroughgoing renovations to existing Pennsylvania Barns. In the broader public realm the Pennsylvania Barn came under attack during these years. A new intellectual and political climate prevailed. Scientists had identified disease pathogens, and connected disease control to scrupulous cleanliness and exposure to light. Judged by the new standards, the Pennsylvania Barn was found wanting. A 1931 article released by the USDA made specific “Suggestions for the Improvement of Old Bank Dairy Barns.” It noted that regulations now “prescribe clean, light, sanitary stables; clean utensils; clean, healthy animals; and careful handling by disease-free labor” in addition to “a clean, wholesome farm-water supply.” In the eastern US, the author went on, “a large number of... barns were built ... before the necessity of cleanliness and health of milk cows was realized. In fact, many of them were built to house beef cattle rather than dairy cows...” He criticized the Pennsylvania Barn because its dark stables kept out germ-killing light. Its inefficiently organized stables were hard to clean, not only because they had too many corners, but because wood was “impossible to disinfect properly.” Poor ventilation, the article charged, would “lower the vitality” of delicate dairy animals.<sup>137</sup>

Commonly recommended renovations included pushing the forebay wall out to the front eaves wall and filling it with windows; gutting the stable interior and paving the floor with concrete; replacing crosswise wooden stalls with lengthwise metal stanchions; and installing ventilation systems.



“Rich farmland. Lancaster County, Pennsylvania.” Photographed by Marion Post Wolcott in 1939. FSA/OWI Collection, Library of Congress, digital ID fsa 8c10460.

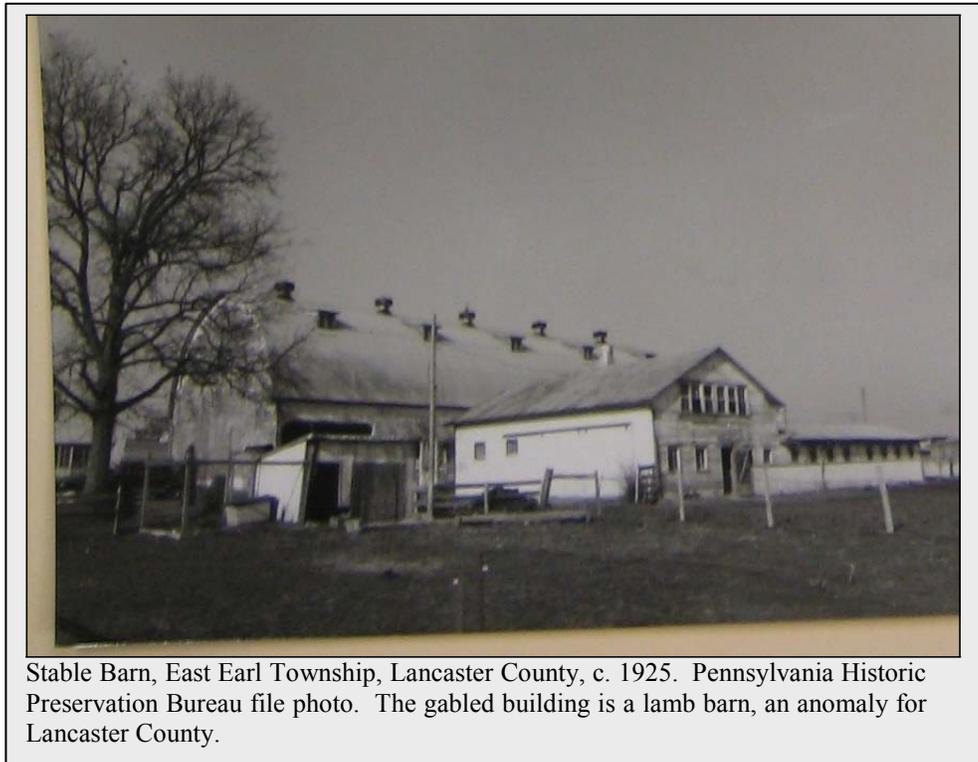
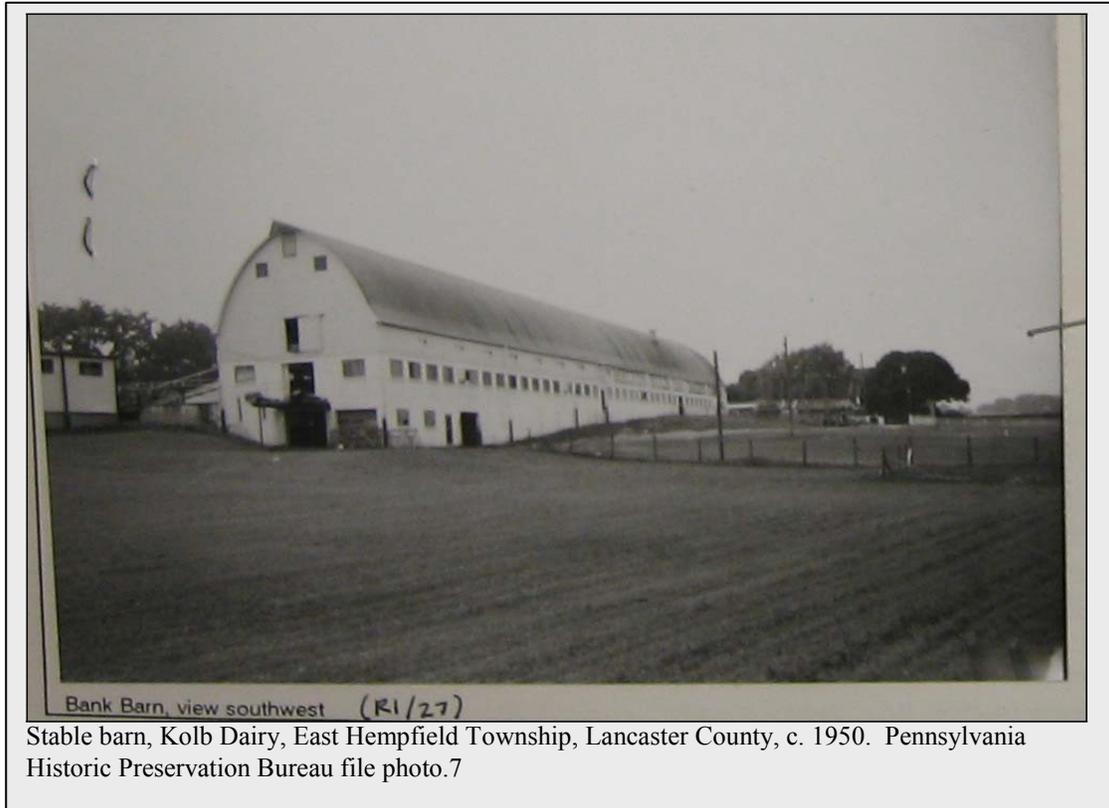
This is a good example of a barn that conformed to new ideals in barn design. The lower level is built of concrete block. It is liberally pierced with large windows and organized lengthwise. The upper level has a gambrel roof for extra hay storage.



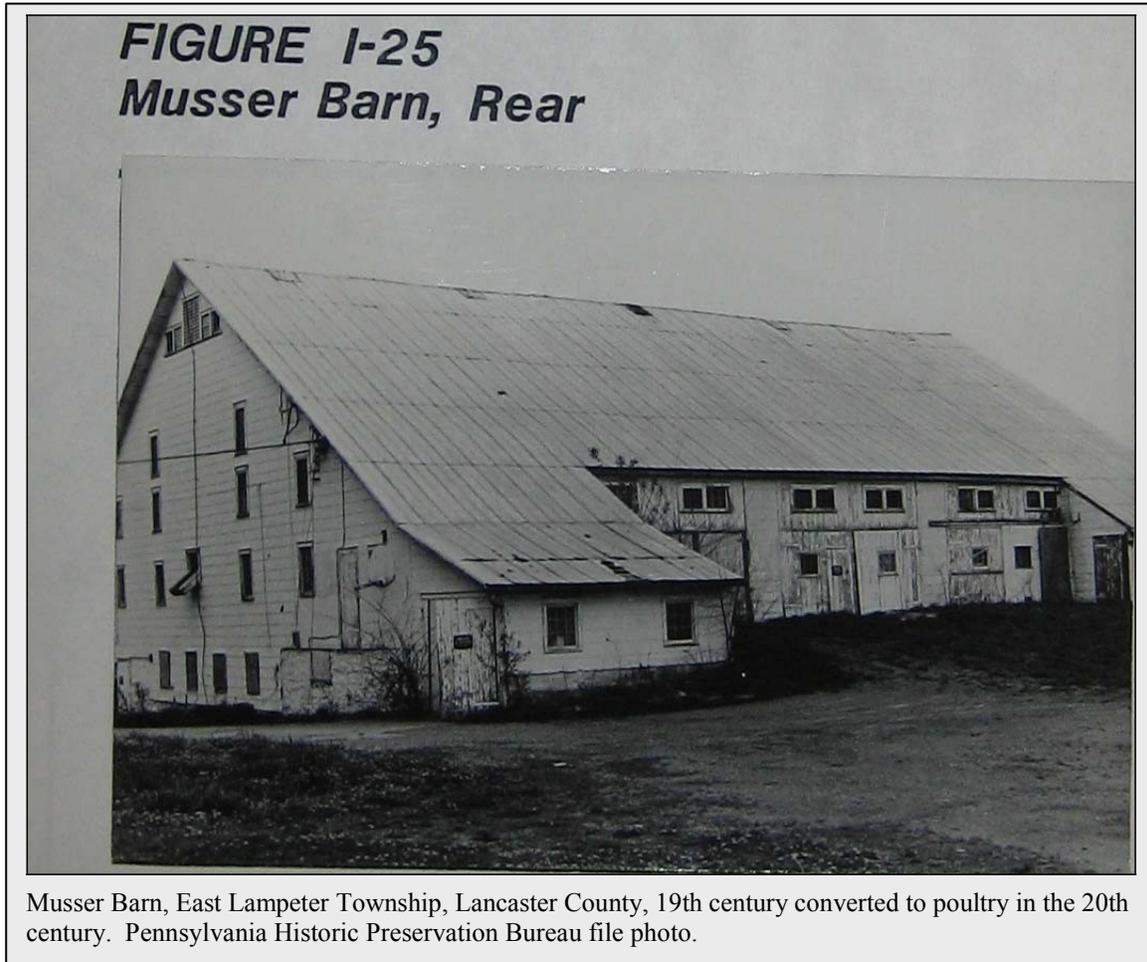
Barn, Conestoga Township, Lancaster County, 19th-20th century. Pennsylvania Historic Preservation Bureau file photo.

This Pennsylvania Barn has been renovated; the forebay wall was extended and windows added, probably for dairying.

At the Kolb Dairy in East Hempfield Township, a stable barn from the mid 20<sup>th</sup> century epitomizes high-end, ideal architectural choices in barns for the period. This c. 1950 barn conformed nicely to reformers' ideals. Ample windows lined the entire eaves side and pierced the ends as well. Concrete replaced wood as the preferred construction material; it was regarded as cleaner than wood. Longitudinal aisles facilitated efficient feeding and manure removal. A huge hay loft took up the entire upper level; like its Pennsylvania Barn predecessor, it was accessed from a bank. But this barn was much more specialized, lacking the Pennsylvania barn's threshing floor, granary, or machinery storage area. The rainbow roof permitted storage for a huge volume.



The agricultural extension agent in 1946 mentioned remodeling a bank barn for poultry. In East Lampeter Township, the Musser Barn is a good example; a bank barn with twin outsheds has been thoroughly redone to accommodate poultry. Windows appear not only in the outsheds but the gable end walls and the bankside eaves wall. Chutes for manure removal protrude from the gable end wall, and the entire barn has been covered.



Musser Barn, East Lampeter Township, Lancaster County, 19th century converted to poultry in the 20th century. Pennsylvania Historic Preservation Bureau file photo.

*Tobacco Barn, 1920-1960*

Older tobacco barns continued in service, and some new tobacco barns were built. Newer ones differed from old not so much in basic design as in materials; circular-sawn vertical plank, lighter framing, and concrete block foundations replaced older materials.

*Milk House, 1920-1960*

The milk house was a 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.<sup>138</sup> 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 19<sup>th</sup> and early 20<sup>th</sup> 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.<sup>139</sup> It is not clear how well these were enforced. 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 earliest in the Northern Tier, because New York City, where most milk went from there, passed quite stringent inspection standards by the 1920s. Other regions, including Lancaster County, were affected later. The milk house was one product of the 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. 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<sup>140</sup> 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.

In Lancaster County, the agricultural extension agent helped farmers comply with new requirements. In 1928, for example, he wrote: “The demands of the Lancaster, Philadelphia and New York milk markets all required that milk houses be constructed on farms where the better grade of market milk is produced. To meet the need the Extension cooperated with a local cement block concern in drawing up plans and in choosing sites for the necessary milk houses. These were built in a majority of the communities of the county and served as demonstrations for other milk producers in respective communities”<sup>141</sup>

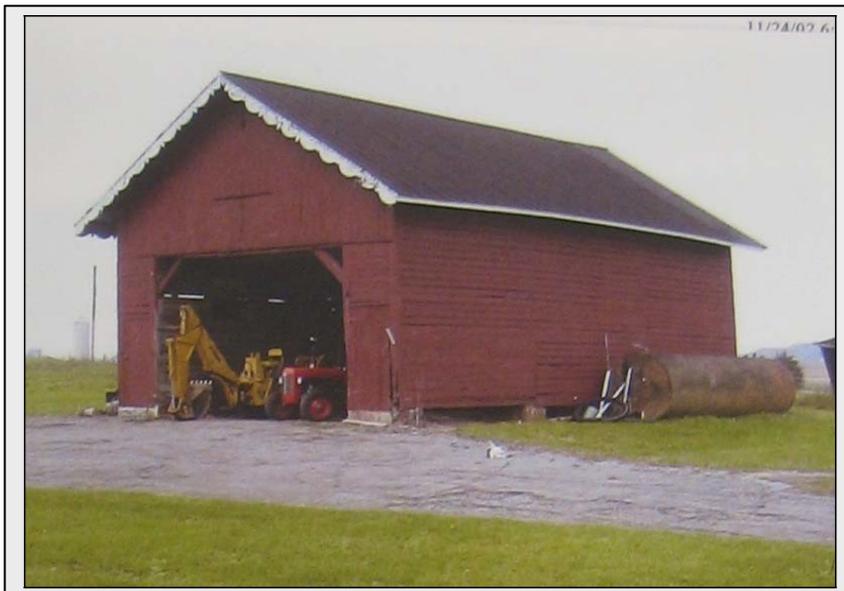


Barn with milk house, Pequea Township, Lancaster County, barn 19th century altered c. 1930; milk house c. 1930-50. Pennsylvania Historic Preservation Bureau file photo.

The milk house is a gabled concrete block structure. Note that the barn forebay has also been pushed out and the eaves wall is filled with large windows.

*Machine Shed, 1920-1960*

As before, Lancaster Plain farms were heavily mechanized. Moreover, farmers here took good care of their equipment: a 1929 survey of farm machinery noted that a very high percentage of Lancaster County farmers surveyed housed all of their machinery – 95%. Only 45% owned a dedicated machine shed, though. Most machinery was stored on the barn floor (60%) and in the tobacco shed (44%). Dedicated machine sheds often were combined with corn cribs.<sup>142</sup>



Drive through corn crib and machine shed, Denver borough, Lancaster County, c. 1880-1920. Pennsylvania Historic Preservation Bureau file photo.



Machine Shed, East Hempfield Township, Lancaster County, c. 1910-1935. Pennsylvania Historic Preservation Bureau file photo.

*Hog House, 1920-1960*

As interest in swine raising dwindled, hog houses became less common. Moreover, new regulations mandated that hog houses be sited at a distance from the cattle barn. (Bovine TB spread easily from cattle to hogs.) Some farmers converted hog houses to poultry houses nonetheless hog raising hung on and even revived during the 1940s.<sup>143</sup>



Hog house, East Hempfield Township, Lancaster County, c. 1910-1930. Pennsylvania Historic Preservation Bureau file photo.

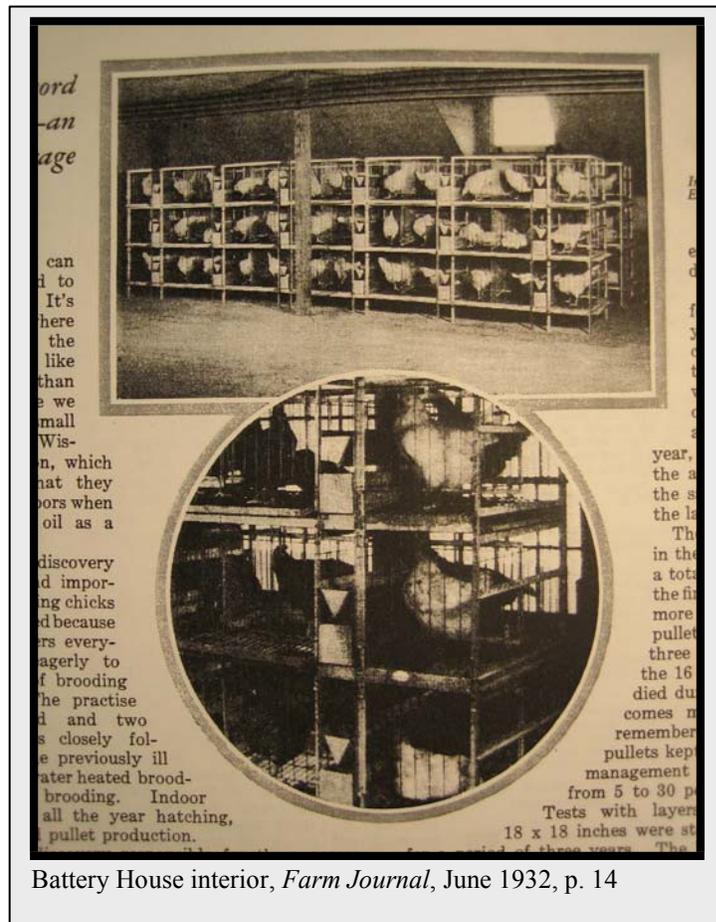
The hog house is in its customary position and is identified through the telltale one-story eaves-side shed-roof extension with windows. Possibly chickens were housed in the upper level.

*Poultry Housing, 1920-1960*

*General trends in poultry housing:* 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.”<sup>144</sup> 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.<sup>145</sup> Notably, one author pointed out that “battery brooding will produce good birds without much experience on the part of the operator...”<sup>146</sup> The shift to less-skilled labor probably occurred as men took over poultry raising, because male laborers were not likely to have the background in poultry raising that women did. 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.





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.<sup>147</sup> These barn renovations did not necessarily always contain battery cages, but they did illustrate the abandonment of free-range practices.

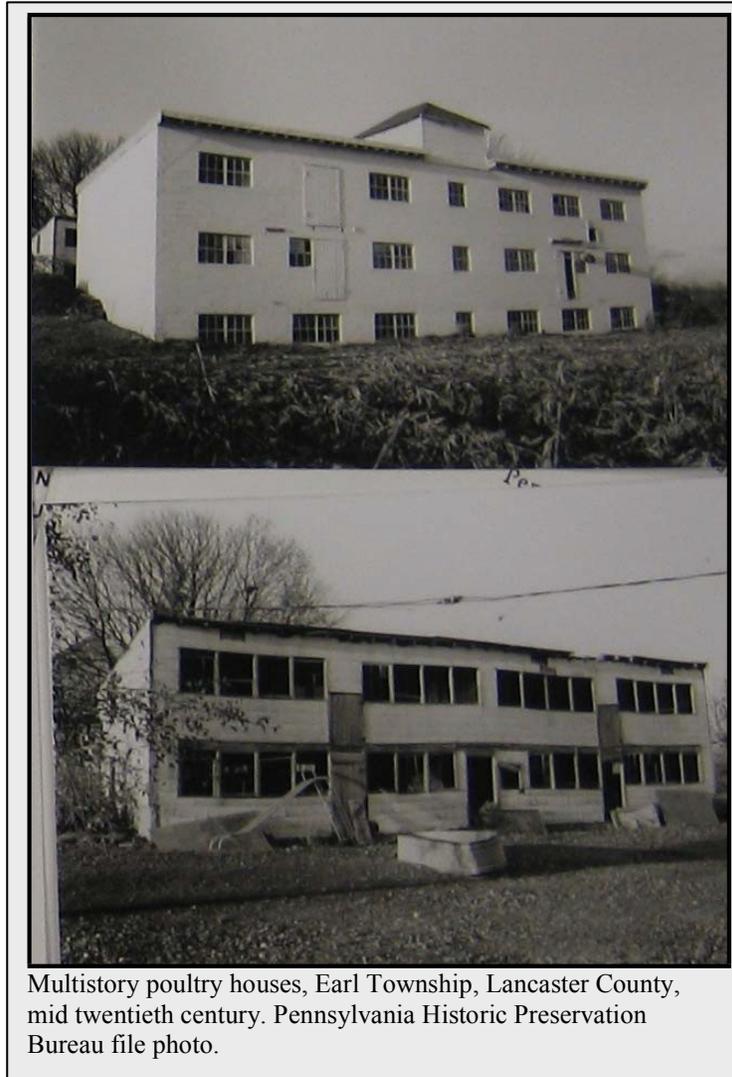
By the 1950s, the battery technique was modified, because cages stacked above one another had resulted in ventilation and disease problems. Among large producers, cages were retained, but in single rows suspended above a concrete floor, often in a long, low building. Waste pits reduced disease and cleanup 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 possible at this time to determine how many farmers in the region took advantage of these technologies.<sup>148</sup> Many continued on a more modest scale and their buildings were correspondingly modest.



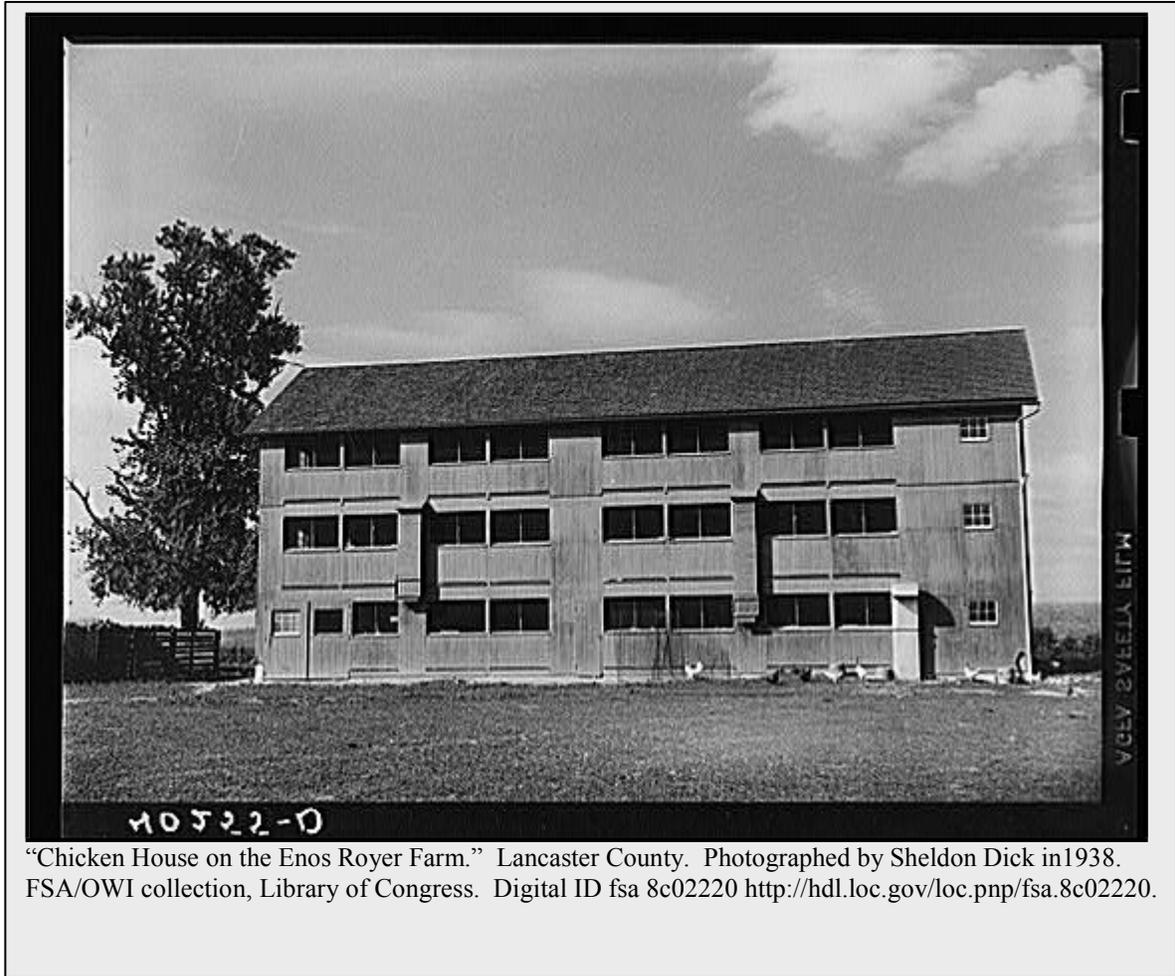
*Poultry housing in Lancaster County:* A boom in building for poultry took place. Existing buildings, such as bank barns and tobacco barns, were pressed into service. Many new, purpose-built poultry houses were erected as well.



Tobacco barn remodeled for poultry, Denver borough, Lancaster County, 20th century. Pennsylvania Historic Preservation Bureau file photo.



Poultry housing was a more or less constant topic in agricultural extension agents' annual reports. By 1948, the reports mention a shift to concrete block and to broiler houses, supplementing layer housing already in wide use. These closely resembled the descriptions in the farm press. By 1959 the agents relate complaints about competition from further south (the Delmarva Peninsula for example) and planning 12,000-layer houses "without windows," heralding the beginnings of modern mass confinement poultry raising.<sup>149</sup>



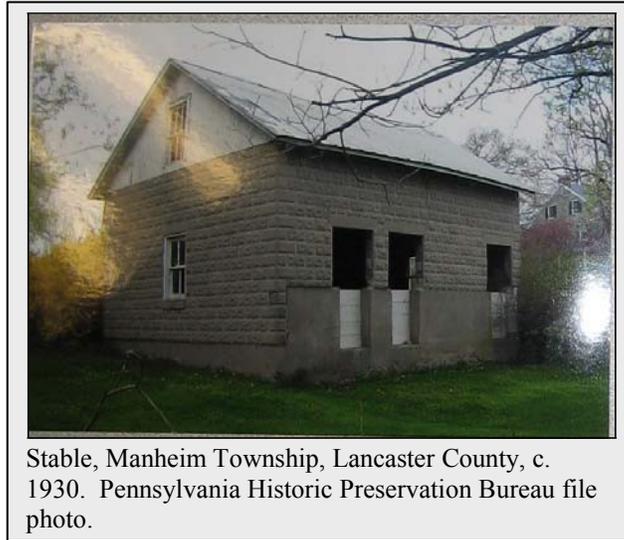
This three-story house was built in the latest style for laying hens.



“Herbert Royer feeding the chickens on the Enos Royer farm.” Lancaster County. Photographed by Sheldon Dick in 1938. FSA/OWI collection, Library of Congress. Digital ID fsa 8c02186.



Royer farm, Lancaster County, Pennsylvania. Chicken house interior. Photographed by Sheldon Dick in 1938. FSA/OWI collection, Library of Congress. Digital ID fsa 8c02193.

*Stable, 1920-1960*

This is an interesting and somewhat anachronistic structure: a new stable. Judging from the rock face concrete block, this building must have been erected in the 1920-40 period. It is a reminder that horses were slow to disappear from the farming scene.

*Pump House, 1920-1960*

Pump House, Denver borough, Lancaster County, 20th century. Pennsylvania Historic Preservation Bureau file photo.

This concrete block structure represents an uncommon building type.

*Garage, 1920-1960*

The farm garage was an increasingly visible structure. Common materials included concrete block, rock-face concrete block, and frame.

*Silo, 1920-1960*

Silos became more common during this era. Predictably, the agricultural extension agent promoted silos, for beef as well as dairy enterprises. By 1927 the county as a whole reported about 2,000 silos – a large number, but still far smaller than the number of farms. Lancaster

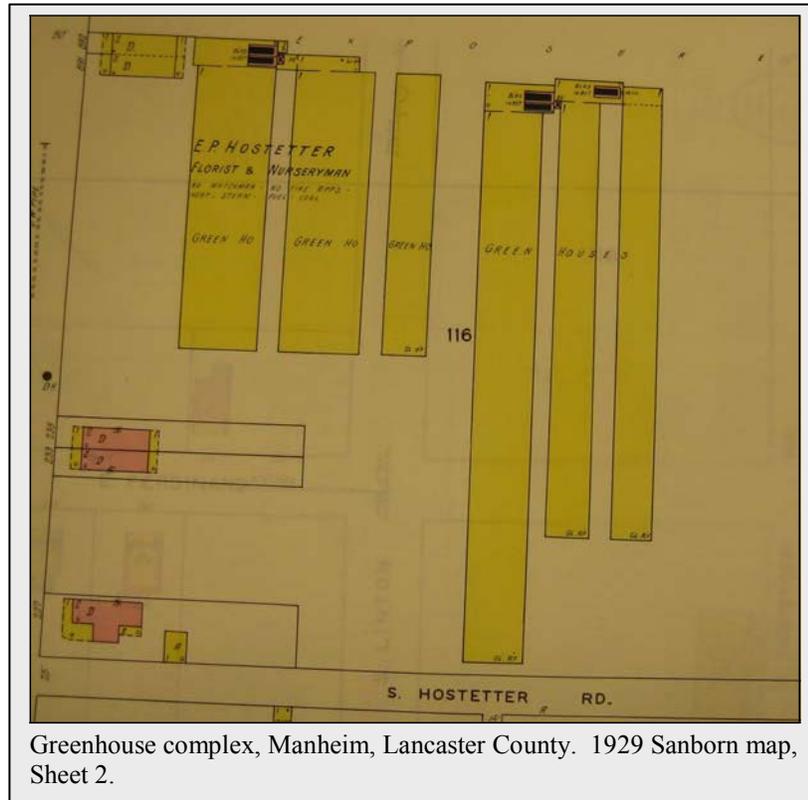
Plain townships varied considerably in the ratio of silos to farms. In general, poured concrete and concrete stave silos superseded tile silos during this period.



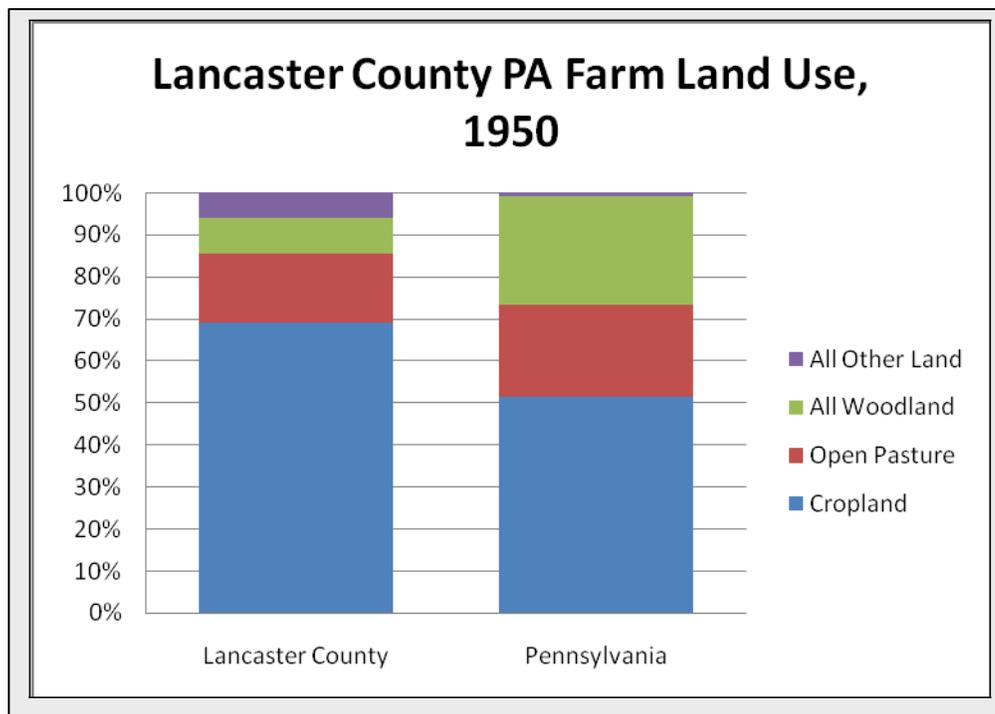
The agricultural extension agent thought that trench silos were becoming more popular by the post World War II period, but the 1950 census reported only a few dozen in the entire county. Trench silos were not very important at this time.<sup>150</sup>

*Greenhouse, 1920-1960*

No extant greenhouses were documented for this study, but Sanborn maps show that they were significant urban landscape features.



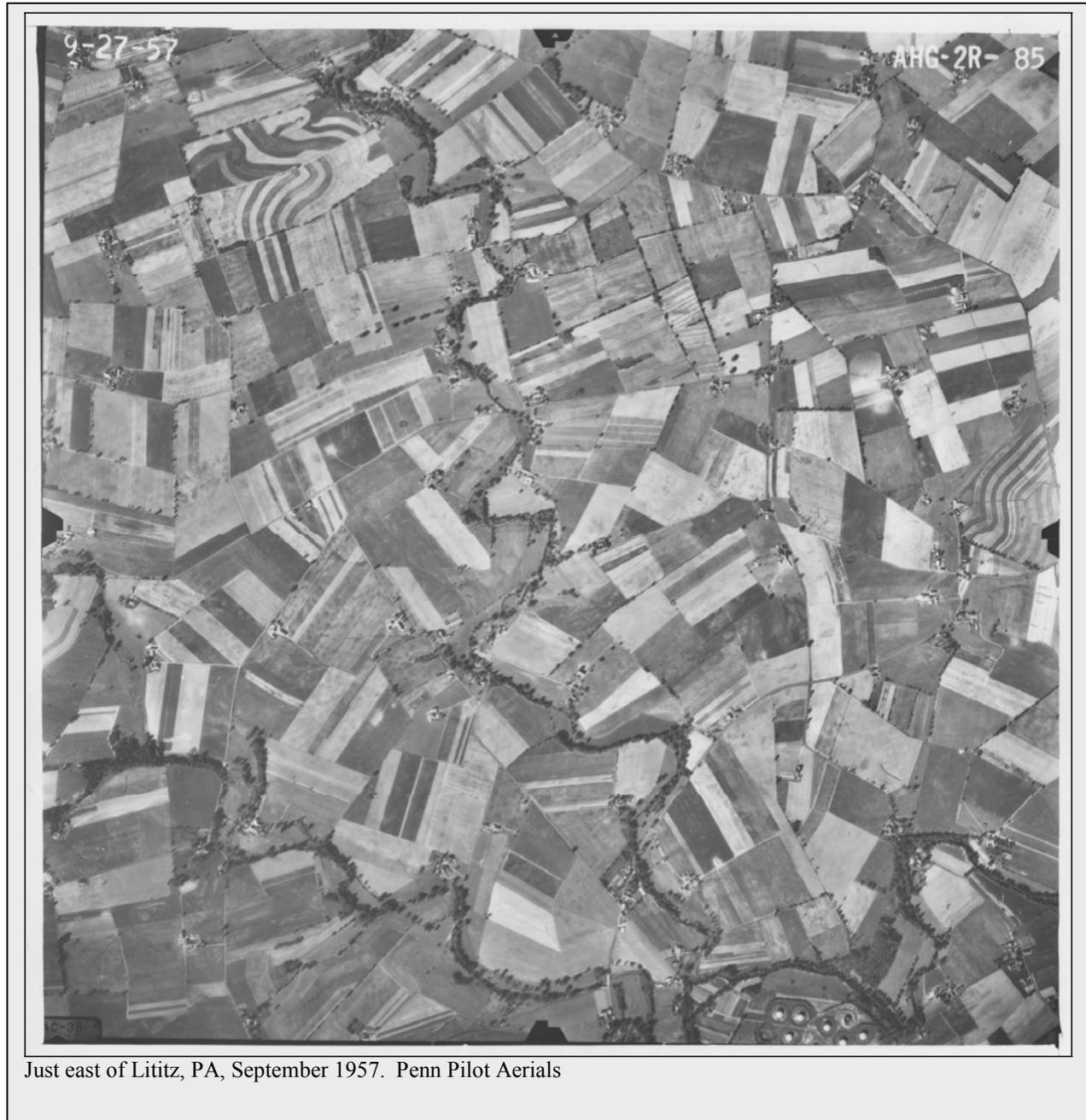
### Landscape Features, 1920-1960



Field Patterns: As always, cropland dominated the Lancaster Plain farm landscape in the mid twentieth century. Open pasture was still to be found, though it was probably concentrated in southern Lancaster County. Woodland and “other” land took up small percentages. The 1940 Penn Pilot aerials show an exquisite pattern shaped by metes-and-bounds property law custom, and by longstanding crop-rotation custom. Fields were relatively small and irregularly shaped, though usually having at least one straight boundary. Though the agricultural extension agents thought local farmers were slow to adopt contour plowing and strip cropping, the 1940 aerials do show instances of both.<sup>151</sup> By 1957, contour plowing and strip cropping were far more common. Evidence appeared of field consolidation. And by 1971 development pressures were visible in the aerials. Overall, woodlot size and shape changed little.



Just east of Lititz, PA, April 1940 aerial. Penn Pilot aerals.



Just east of Lititz, PA, September 1957. Penn Pilot Aerials

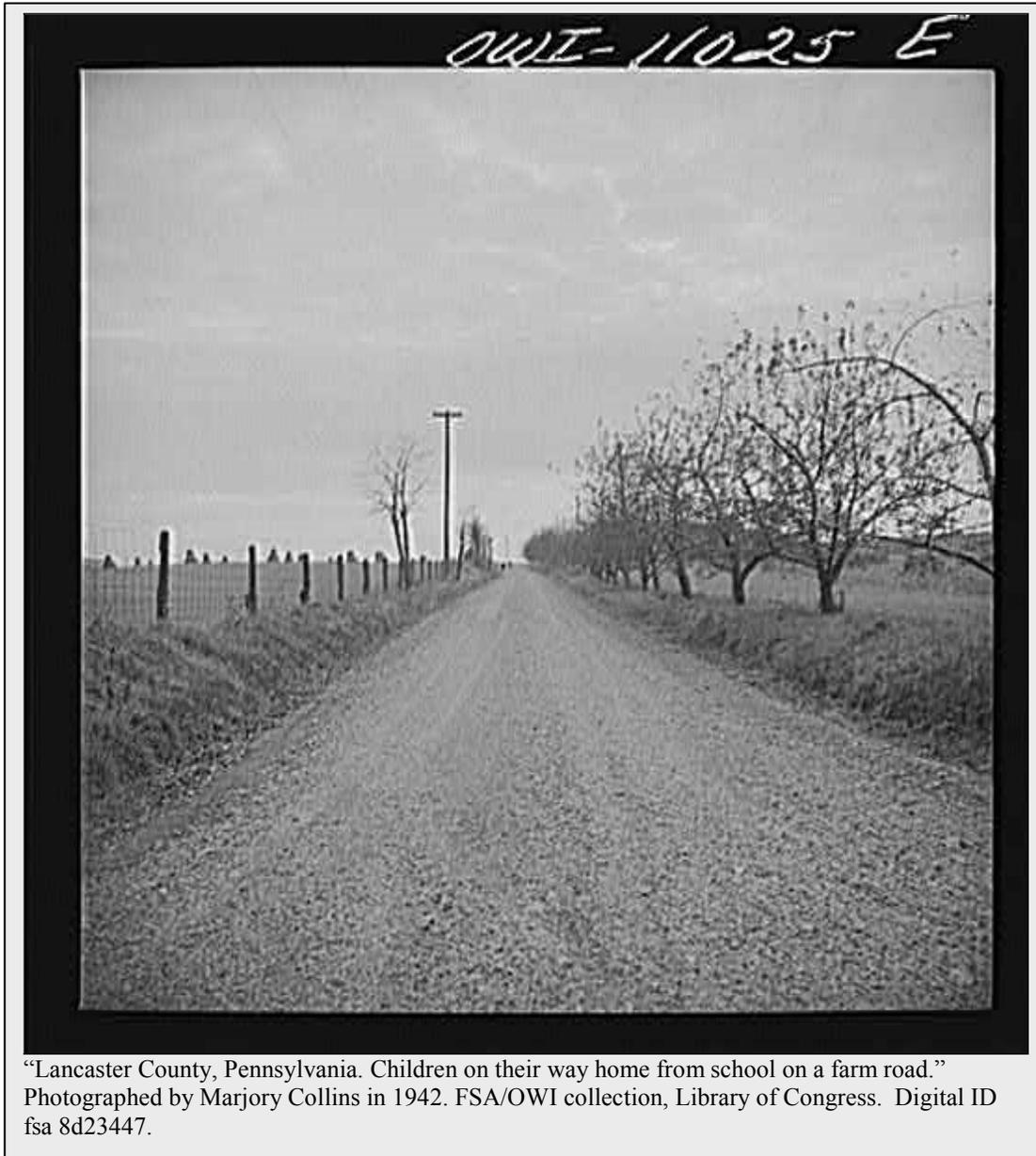
Contour plowing, a pond or two, some field consolidation, and development have appeared. Boundaries: Treelines marking field boundaries stayed intact in many instances also.

Sheaves of grain and large straw stacks were commonplace sights well into the twentieth century; but those are ephemeral landscape features. Some Amish farm families still make sheaves of grain.

Fencing: Fencing around the barn yard continued to be important; sturdy wood or even cement replaced stone fences.



“Mennonite farmer going to town, near Lancaster, Pennsylvania.” Photographed by Marion Post Wolcott in 1941. FSA/OWI collection, Library of Congress. Digital ID fsa 8a40909



“Lancaster County, Pennsylvania. Children on their way home from school on a farm road.”  
Photographed by Marjory Collins in 1942. FSA/OWI collection, Library of Congress. Digital ID  
fsa 8d23447.

This image shows fence made of woven wire and wood posts. Note also the utility poles and orchard trees.

Pasture: While the proportion of pasture land in the county as a whole was small, and in the Plain probably smaller, pasture did form part of some farm land allocations. Thus fencing continued to be important in some spots.

Drainage: The agricultural extension agent mentioned open ditches and diversion ditches from time to time, but material evidence for these activities is slim.<sup>152</sup> There was very little discussion in *Lancaster Farming* magazine, either. It is not clear that drainage was a pressing issue.

Ponds: As elsewhere, ponds became popular after World War II. Large scale digging equipment, aid from conservation districts, encouragement from insurance companies, and more financial resources contributed to a pond building movement. The agent in 1956 claimed that there were 1,000 new ponds in the county. They do not really appear prominently in the aerial photos, though.

Utility Poles and Lines: By 1950, about 80 percent of Lancaster County farm households reported electricity, and over half had telephones. These figures were fairly close to state averages. Thus utility poles and power lines became familiar rural landscape features.<sup>153</sup>

---

## **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.<sup>154</sup>

### **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 show 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.<sup>155</sup> 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.

---

## Registration Requirements for the Lancaster Plain Historic Agricultural Region

Property types are the same as for the state as a whole: Farmstead, Farm, and Historic Agricultural District.

Registration Requirements for the Lancaster Plain:

To be determined significant with respect to Criterion A for agriculture in this region, a property 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 range of buildings and landscape features that illustrate change over time in the region's agricultural history.

Substantive Guidelines:

**1) Strong representation of typical buildings and landscape features from one chronological phase of the region's agricultural history:** A property will normally be significant under Criterion A only if: 1) its individual production system, for the period in question, reflects the average or above average production levels for its township in the same period, 2) its built environment and landscape reflects that product mix, 3) its built environment and landscape reflects locally prevalent levels of mechanization and tenancy, and labor patterns, and 4) if, in instances where a farm has a strong, documented connection to a particular ethnic group or land tenure system, its architecture and landscape shows show evidence of that connection. [See Narrative for discussion].

To be considered significant for agriculture in the period “Diverse Production for Diverse Uses, c. 1730 to about 1780,” a farmstead should contain a house characteristic of the period; and either an early barn or an outbuilding dating from the period. A kitchen ell or basement cellar on a farmhouse should be considered an equivalent productive space. A farm should contain remnant cropland and woodlot. A historic agricultural district should have a more or less contiguous collection of farms representing these features.

To be considered significant for agriculture in the period “Diversified Production, Intensification, and Livestock Raising, c. 1780-1865,” a farmstead should have a farmhouse characteristic of the period; a Pennsylvania Barn; at least two outbuildings (such as spring house, smoke house, corn crib, machine shed, or carriage house) reflecting production patterns and the intensified mechanization of the era. A tenant house would enhance the case for significance, particularly if the property documentation shows that the farm historically had tenants. A farm should have crop land and pasture land. Remnant fencelines, treelines, and circulation corridors would enhance the case for significance. A historic agricultural district should have a more or less contiguous collection of farms representing these features.

To be considered significant for agriculture in the period “Crops, Livestock, and Tobacco, c 1865- about 1920,” it is desirable – but not imperative -- that a farmstead have a house characteristic of the period, preferably with summer kitchen. If the farm has a history of tenancy, a tenant house would add to significance. The farmstead should have a Pennsylvania Barn dating from the period, or an older barn with modifications characteristic of the period. There should be architectural evidence for tobacco raising – either a freestanding tobacco barn or modifications to another building. Other outbuildings which strengthen the case for significance would include machine sheds, hog houses, smoke houses, spring houses, poultry houses, and corn cribs. A farm should have the buildings plus cropland. A historic agricultural district should have a more or less contiguous collection of farms representing these features.

To be considered significant for agriculture in the period “Livestock, Truck Farming, Tobacco, and Poultry, 1920-1960,” a farmstead should have a house characteristic of the period, or one with an earlier date. If the property has a history of tenancy, a tenant house would add to significance. The farmstead should have a Pennsylvania Barn (likely an earlier barn with modifications dating from the period) or a stable barn or tobacco barn, depending on the property’s history. Outbuildings should reflect the specific property’s production history. In other words, if poultry was emphasized, there should be twentieth-century poultry housing. Other outbuildings which strengthen the case for significance would include machine sheds, garages, and corn cribs. A farm should have the buildings plus cropland. A historic agricultural district should have a more or less contiguous collection of farms representing these features.

**2) A range of buildings and landscape features that illustrate change over time in the region’s agricultural history.**

There are many ways in which a farmstead, farm, and historic agricultural district can illustrate the key changes over time in the Lancaster Plain region’s agricultural history. An individual farmstead might have an eighteenth-century house, mid- nineteenth-century Pennsylvania Barn and smokehouse, late nineteenth-century summer kitchen and tobacco barn, and twentieth-century poultry house. A historic agricultural district might contain farmsteads each representing a different period. Key agricultural changes should be represented architecturally and by landscape features.

---

## **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 posses high artistic values, or, as a rural historic district, that represent a significant and distinguishable entity whose components lack individual distinction”.<sup>156</sup>

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 ...”.<sup>157</sup> 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.<sup>158</sup> 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 Revivalized 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; date stones; 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”?*

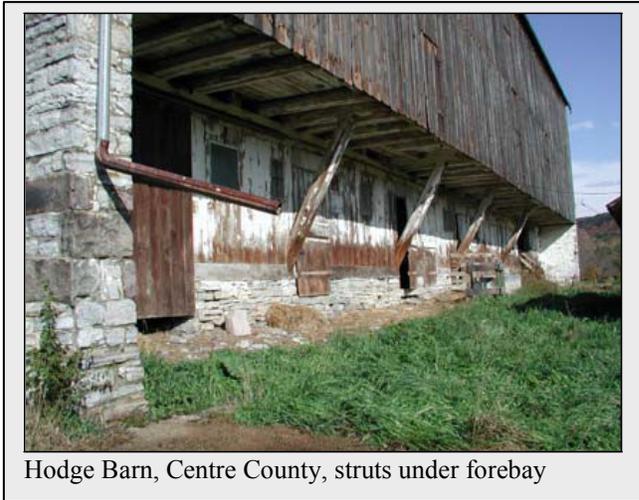
This is the most hard to define category of the three. It connotes skill in achieving desired aesthetic qualities. For example, careful proportions, sensitive siting, and originality of design are important components of aesthetic merit. Again, ornament is where aesthetic merit shows most clearly, for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

### Examples

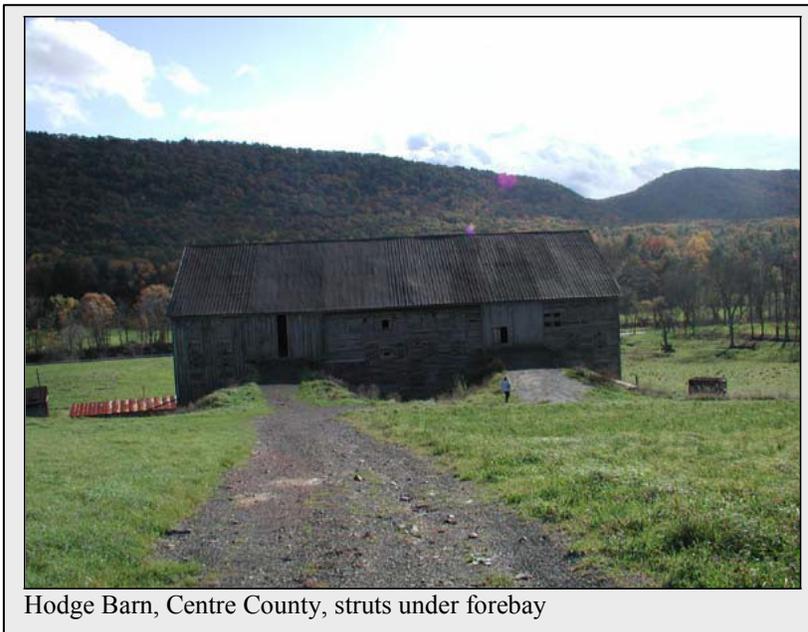
Example 1: Hodge Barn, Centre County, c. 1870. This is a double-decker Pennsylvania barn with decorative ornament, double bankside bridges, and struts under the forebay, located in Centre County. This barn would qualify under Architecture because of its design features (double decker with multiple mows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

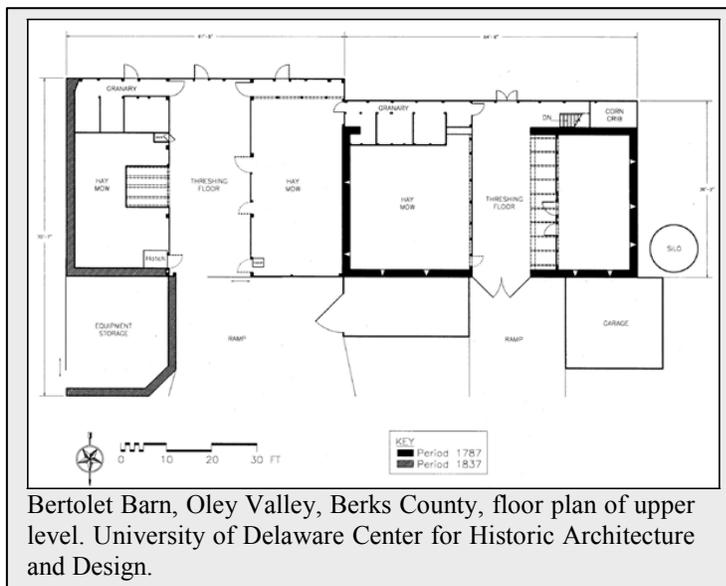
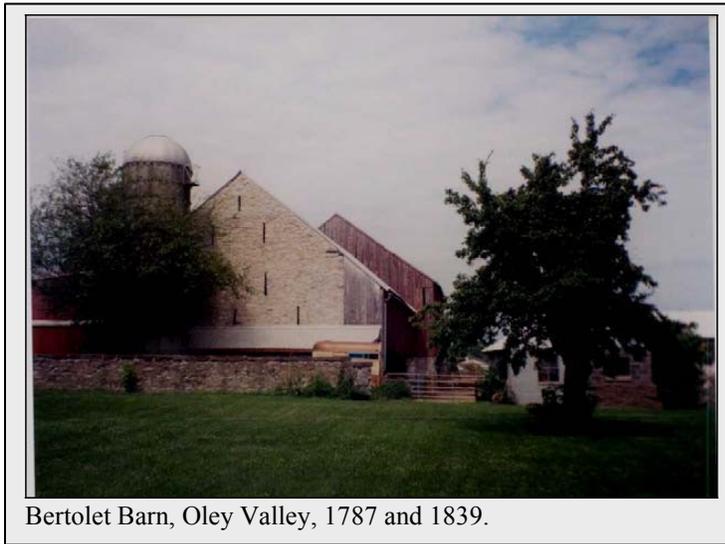


Hodge Barn, Centre County, struts under forebay

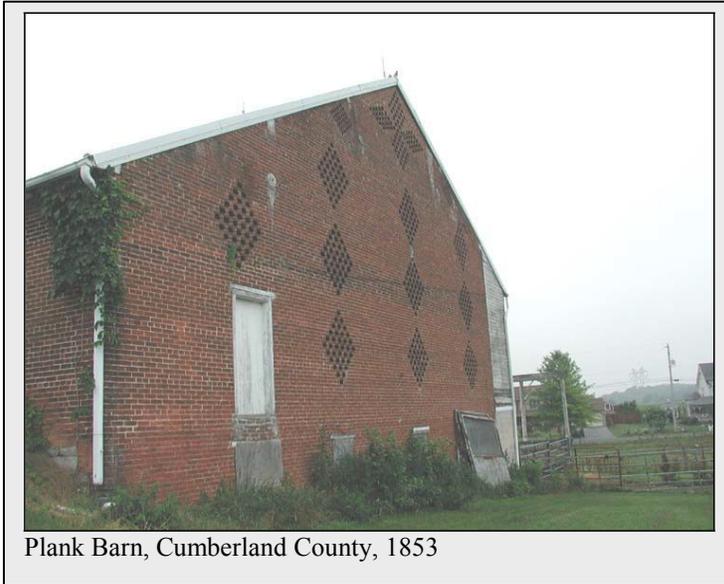


Hodge Barn, Centre County, struts under forebay

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.



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



Plank Barn, Cumberland County, 1853

the diamond motifs. The date stone 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.

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.



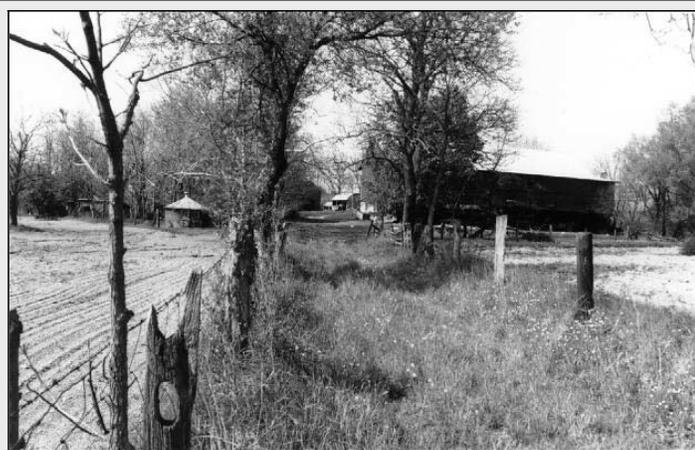
Smokehouse, Tulpehocken Manor, Lebanon County, late 18<sup>th</sup> century

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 20<sup>th</sup> 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 sites 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" (McGuire 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.

## 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.”<sup>159</sup>

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.”<sup>160</sup>

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 – i.e. 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”<sup>161</sup> 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.”<sup>162</sup> 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.”<sup>163</sup> 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.

## **Bibliography for Property Types and Registration Requirements, Criterion D, Archaeology**

Bailey, Daniel N., David L. Weinberg, and John W. Lawrence

2004 From Log House to Brick Mansion, Continuity and Contradiction in Quaker Life and Thought: Data Recovery at the Hoopes House Site, 36CH0732. Report on file, Pennsylvania Historical and Museum Commission, Harrisburg, PA.

Beaudry, Mary C. 1986 "The Archaeology of Historical Land Use in Massachusetts." *Historical Archaeology* 20(2):38-46. 2001-2002 "Trying to Think Progressively about Nineteenth-Century Farms." *Northeast Historical Archaeology* 30-31:129-142.

Bowen, Joanne

1998 "To Market, To Market: Animal Husbandry in New England." *Historical Archaeology* 32(3):137-152.

Cabak, Melanie A., Mark D. Groover, and Mary M. Inkrot

1999 "Rural Modernization During the Recent Past: Farmstead Archaeology in the Aiken Plateau." *Historical Archaeology* 33(4):19-43.

Catts, Wade P.

2001-2002 "Research Questions for the Archaeology of Rural Places: Experiences from the Middle Atlantic." *Northeast Historical Archaeology* 30-31: 143-154.

Friedlander, Amy

1991 "House and Barn; The Wealth of Farms, 1795-1815." *Historical Archaeology* 25(2):15-29.

Garman, James C., Paul A. Russo, Stephen A. Morozowski, and Michael A. Volmar

1997 "'This Great Wild Tract': Henry David Thoreau, Native American, and the Archaeology of Estabrook Woods." *Historical Archaeology* 31(4):59-80.

Garrison, Ervan G.

1996 "Archaeogeophysical and Geochemical Studies at George Washington Carver National Monument, Diamond, Missouri." *Historical Archaeology* 30(2):22-40.

McGuire, Randall H. and Mark Walker

1999 "Class Confrontations in Archaeology." *Historical Archaeology* 33(1):159-183.

Miller, George L.

1980 "Classification and Economic Scaling of 19th Century Ceramics." *Historical Archaeology* 14:1-40.

Price, Cynthia R.

1985 "Patterns of Cultural Behavior and Intra-Site Distributions of Faunal Remains at the Widow Harris Site." *Historical Archaeology* 19(2):40-56.

Rotman, Deborah L. and Michael S. Nassaney

1997 "Class, Gender, and the Built Environment: Deriving Social Relations from Cultural Landscapes in Southwest Michigan." *Historical Archaeology* 31(2):42- 62.

Scharfenberger, Gerard P. and Richard F. Veit

2001-2002 "Rethinking the *Mengkom* Mixing Bowl: Salvage Archaeology at the Johannes Luyster House, a Dutch-American Farm." *Northeast Historical Archaeology* 30-31: 53-72.

Stewart-Abernathy, Leslie C., and Barbara L. Ruff 1989 "A Good Man in Israel:

Zooarchaeology and Assimilation in Antebellum Washington, Arkansas." *Historical Archaeology* 23(2):96-112.

Stine, Linda F. 1990 "Social Inequality and Turn-of-the-Century Farmsteads; Issues of Class, Status, Ethnicity, and Race." *Historical Archaeology* 24(4):37-49.

Whittaker, William E.

1999 "Production of Animal Commodities at Plum Grove, Iowa City." *Historical Archaeology* 33(4):44-57.

Wurst, Lou Ann and Robert K. Fitts

1999 "Introduction: Why Confront Class?" *Historical Archaeology* 33(1):1-6.

Wurst, Lou Ann

1999 "Internalizing Class in Historical Archaeology." *Historical Archaeology* 33(1): 7-21.

## Endnotes

<sup>1</sup> Joseph Glass, "Agricultural Regions of Lancaster County, Pennsylvania," MS Thesis, Department of Geography, Penn State University, 1959, maps p 20, 22, 27, 50, 51.

<sup>2</sup> James Lemon, *The Best Poor Man's Country* (Baltimore: Johns Hopkins University Press, 1972), 47; Redmond Conygham, "On the Early Settlement of the Valley of the Pequea," 1842, PSU Libraries Digital Collections.

<sup>3</sup> Lemon, *Best Poor Man's Country*, 151.

<sup>4</sup> Brooke Hunter, "Rage for Grain: Flour Milling in the Mid-Atlantic 1750-1815," Ph. d Dissertation, History, University of Delaware, 2002, 25, 62; Carole Shammas, "How Self-Sufficient Was Early America?" *Journal of Interdisciplinary History* XIII (Autumn 1982): 247-272; James Lemon, "Household Consumption in Eighteenth-Century America and its Relationship to Production and Trade: the Situation Among Farmers in Southeastern Pennsylvania," *Agricultural History* 41 (1967): 59-70; Gerald Lestz, *A Brief History of Transportation in Lancaster County* (Ephrata, PA: Science Press, 1979), 7-10; John Strohm and Herbert Hack, "The Conestoga Horse," *Papers Read before the Lancaster County Historical Society* (1940).

<sup>5</sup> Lemon, *Best Poor Man's Country*, 179-182; Tench Coxe, *View of the U. S. of America in a Series of Papers...1794*, 64, 89; James Westfall Thompson, *History of Livestock Raising in the US, 1607-1860* (USDA, Agricultural History Series # 5, November 1942), 46-7; Percy Wells Bidwell and John Falconer, *History of Agriculture in the Northern States 1620-1840* (New York: Peter Smith, 1941), 27, 42, 45, 47; James Lemon, "The Agricultural Practices of National Groups in Eighteenth-Century Southeastern Pennsylvania," *Geographical Review* LVI (October 1966): 467-496; John Walzer, "Colonial Philadelphia and its Backcountry," *Winterthur Portfolio* 7 (1971): 161-173. On distilling: Daniel I. Rupp, *History of Lancaster County*, (Lancaster, 1844), 299-304; Levi Huber, "Two Hundred Years of Farming in Lancaster County," *Journal of the Lancaster County Historical Society* 34(1930), 100. Spelt is mentioned in Franklin Ellis and Samuel Evans, *History of Lancaster County Pennsylvania...* (Philadelphia: Ensign and Everts, 1883), 346-8, 350.

<sup>6</sup> Levi Huber, "Two Hundred Years of Farming in Lancaster County," *Journal of the Lancaster County Historical Society* 34 (1930), 97-110. A search of the digitized *Pennsylvania Gazette* turned up but one mention, of a mill in Northampton County that advertised stones for grinding spelt. March 20, 1766. Obtained through Accessible Archives.

<sup>7</sup> Michael V. Kennedy, "Cash for His Turnups": Agricultural Production for Local Markets in Colonial Pennsylvania, 1725-1783," *Agricultural History*, 74, No. 3 (Summer, 2000), 587-608. Quote is from page 606.

<sup>8</sup> Arthur Lord, "The Pre-Revolutionary Agriculture of Lancaster County Pennsylvania," *Proceedings of the Lancaster County Historical Society*, Hilarymas 1975, 23-42. We see here that Lord's, Kennedy's, and Lemon's estimate of average farm size diverge significantly. The discrepancies reflect different geographic areas covered by the three, and also the difficulties created by fragmentary and ambiguous source materials.

<sup>9</sup> John Hostetler, *Land Use, Ethics, and Agriculture in Lancaster County*. Special report for the Pennsylvania Department of Transportation, 1988. Penn State Special Collections Library. See especially pages 5-8.

<sup>10</sup> For an early twentieth-century statement, see H. Frank Eshleman, "Our County's Introduction of Intensive Agriculture to the United States," *Papers Read Before the Lancaster County*

*Historical Society* XXXIII, no. 3 (1929), 27-33. For recent scholarly treatments, see Gabrielle Lanier, *The Delaware Valley in the Early Republic* (Baltimore: Johns Hopkins University Press, 2005); Cynthia Falk, *Architecture and Artifacts of the Pennsylvania Germans, Constructing Identity in Early America*. (University Park, PA: The Pennsylvania State University Press, 2008); David Walbert, *Garden Spot: Lancaster County, the Old Order Amish, and the Selling of Rural America* (New York: Oxford University Press, 2002); David Weaver-Zercher, *The Amish in the American Imagination* (Baltimore: Johns Hopkins University Press, 2001).

<sup>11</sup> Lemon, "The Agricultural Practices of National Groups"; Lord, "Prerevolutionary Agriculture," 40. Brian Donahue, in *The Great Meadow: Farmers and the Land in Colonial Concord* (New Haven: Yale University Press, 2004), has challenged the view that New England colonists pursued a wasteful and unsustainable agriculture, but no researcher has to date challenged these assumptions about agriculture in Pennsylvania.

<sup>12</sup> Elinor F. Oakes, "A Ticklish Business: Dairying in New England and Pennsylvania, 1750-1812." *Pennsylvania History* 1980 47(3): 195-212; Joan M. Jensen, *Loosening the Bonds, mid-Atlantic Farm Women, 1750-1850* (New Haven: Yale University Press, 1986); Kennedy, "Cash for his Turnups," 603-4; Ellis and Evans, *History of Lancaster County*, 349.

<sup>13</sup> Lemon, *Best Poor Man's Country*, 95; Sharon Salinger, *'To Serve Well and Faithfully': Labor and Indentured Servants in Pennsylvania, 1682-1800* (New York: Cambridge University Press, 1987); Farley Grubb, "Immigrant Servant Labor: Their Occupational and Geographic Distribution in the Late Eighteenth Century Mid Atlantic Economy," *Social Science History* 9 (1985): 249-276; Gary Nash and Jean Soderlund, *Freedom by Degrees: Emancipation in Pennsylvania and its Aftermath* (New York: Oxford University Press, 1991); Lucy Simler, "Tenancy in Colonial Pennsylvania: the Case of Chester County," *William and Mary Quarterly* 3d ser., 43, No. 4 (October, 1986): 542-569.

<sup>14</sup> J. I. Mombert, *An Authentic History of Lancaster County, in the State of Pennsylvania* (Lancaster, 1869), 364.

<sup>15</sup> The 1798 Direct Tax records show this clearly. See Lanier, *Delaware Valley*.

<sup>16</sup> *Lancaster County Architecture, 1700-1850*.

<sup>17</sup> Robert Bucher, "Grain in the Attic," *Pennsylvania Folklife* 13 (Winter 1962-63), 7-15.

<sup>18</sup> Arthur Lord, "The Pre-Revolutionary Agriculture of Lancaster County Pennsylvania," *Proceedings of the Lancaster County Historical Society*, Hilarymas 1975, pp. 23-42; Robert Bucher, "Grain in the Attic," *Pennsylvania Folklife* 13 (Winter 1962-63), 7-15; Philip E. Pendleton, *Oley Valley Heritage: The Colonial Years, 1700-1775*. Birdsboro, PA: The Pennsylvania German Society, 1994), 96.

<sup>19</sup> 1798 Direct Tax, compiled by the University of Delaware and available at <http://dspace.udel.edu:8080/dspace/handle/19716/1340>. But see also the figures in Arthur C. Lord, "Barns of Lancaster County: 1798," *Journal of the Lancaster County Historical Society* 77 (1973): 26-40. The rich Oley Valley in Berks County was an exception; see Philip Pendleton, *Oley Valley Heritage*, 94. On the ground-level barn, see Alan G. Keyser and William P. Stein, "The Pennsylvania German Tri-Level Ground Barn," *Quarterly of the Pennsylvania German Society*, 9 (December 1975): 1-25.

<sup>20</sup> Ellis and Evans, *History of Lancaster County*, 348-9; Robert C. Bucher and Alan G. Keyser, "Thatching in Pennsylvania," *Der Reggeboge* 16 (1982): 1-23; *Lancaster County Architecture 1700-1850*, 65.

<sup>21</sup> Pownall's description was quoted in Mombert, *An Authentic History of Lancaster County*, 371.

<sup>22</sup> See for example an ad in the *Pennsylvania Gazette* for September 15, 1784. There are many more instances. Obtained through Accessible Archives.

<sup>23</sup> Steven Stoll, *Larding the Lean Earth, Soil and Society in Nineteenth-Century America* (New York, 2002), 82, notes the general trend in the Northern states. See also Levi Huber, "Two Hundred Years of Farming in Lancaster County," *Journal of the Lancaster County Historical Society* 34 (1930), 98-9.

<sup>24</sup> Fletcher, *Pennsylvania Agriculture and Country Life*, 181; Lemon, *Best Poor Man's Country*, 197-8. The *Pennsylvania Gazette* announced in 1776 that one Thomas Smith bought six beef cattle in Leacock Township, leaving as security a "small chestnut horse." In 1788 Sebastian Graff, "living near Lancaster," advertised "About thirty head of cattle, Such as Heifers, Steers and Cows, fit to be turned into grass the ensuing season." Accessible Archives.

<sup>25</sup> Ellis and Evans, *History of Lancaster County*, 351.

<sup>26</sup> Ellis and Evans, *History of Lancaster County*, 180. Gerald Lestz, *A Brief History of Transportation in Lancaster County* (Ephrata, PA: Science Press, 1979); also H. W. Kriebel, *Seeing Lancaster County from a Trolley Window* (Lititz, PA: the Express Printing Company, 1910), 76.

<sup>27</sup> "For the American Farmer," *American Farmer* February 25, 1820, 48; APS online.

<sup>28</sup> "Agricultural Condition of Pennsylvania," *Farmer's Register* June 30, 1842, 273. American Periodical Series online. "Interesting Travels in America," *The Port-Folio* October 9, 1802, 314 (American Periodicals Series online); "Grazing in Eastern Pennsylvania," *The Cultivator* February 1846, 63 (American Periodicals Series online); February 1846, 63 (American Periodicals Series online); United States Patent Office Annual Reports, Agriculture, 1844, page 337.

<sup>29</sup> J. W. White, "Lime Requirements on Pennsylvania Soils," Penn State Agricultural Experiment Station Bulletin # 164 (July 1920), 1, 23.

<sup>30</sup> H. Winslow Fegley, *Farming, Always Farming*. (Birdsboro, PA: The Pennsylvania German Society, 1986), caption to Figure 91, page 103. Thanks also to Jeffrey Graybill, Lancaster County Agricultural Extension. See also Ellis and Evans, *History of Lancaster County*, 351.

<sup>31</sup> U. S. Census of Agriculture, 1850, Instructions to Marshals and Assistants, xxiii.

<sup>32</sup> Steven Stoll, *Larding the Lean Earth: Soil and Society in Nineteenth-Century America* (New York: Hill and Wang, 2002); Lemon, *Best Poor Man's Country*, Table 10, page 38. Kuan-Y Chen, "Agricultural Production in Pennsylvania, 1840 to 1950," Ph.D. thesis, Pennsylvania State University, Agricultural Economics/Rural Sociology, 1954.

<sup>33</sup> "On the Pennsylvania Mode of Getting Out Clover Seed," *American Farmer* January 12, 1820, page 42. APS Online. See also "Interesting Travels in America..." *The Port-Folio*, October 9, 1802, page 40; APS online.

<sup>34</sup> Samuel Preston, "Gardening of the Germans in Pennsylvania," *New England Farmer* September 25, 1829, page 80 (American Periodicals Series online).

<sup>35</sup> Henry L. Fisher, "Harvesting," in *Olden Times: Or Rural Life Some Fifty Years Ago, and Other Poems* (York, PA: Fisher Brothers, 1888), 87-115, represented Pennsylvania German men and women working together at harvest time. Phebe Earle Gibbons, '*Pennsylvania Dutch, and other Essays* (Philadelphia: Lippincott, 1874), 43, noted that Pennsylvania German women did the milking.

<sup>36</sup> United States Patent Office Annual Report, Agriculture, 1848, page 687.

<sup>37</sup> William H. Boyd, *Boyd's Lancaster County Business Directory* (Lancaster, PA: Sprenger and Westhaeffer, 1859), 15, 35, 271-2, 176.

<sup>38</sup> Schneider, *Foundations in a Fertile Soil*, 52-56

<sup>39</sup> For further discussion of Lancaster County rural houses, see Schneider, *Foundations in a Fertile Soil*; and *Lancaster County Architecture, 1700-1850*.

<sup>40</sup> For advertisements describing farms with tenant houses, see: *Lancaster Journal*, September 1, 1826, an ad for a property with a "comfortable Log Tenement...suitable for a tenant;" *Lancaster Intelligencer* January 4, 1848, page 4, farm with a stone dwelling house and "good Tenant House;" *Lancaster Intelligencer* September 12, 1848, page 3, a two story brick farm house and a one-story brick tenant house;" Farm in Lampeter with a "large two-story brick dwelling house 50 by 40 feet [and] a Tenant House..." All obtained via Lancaster County Historical Society Digitization Project, <http://lcdp.wetpaint.com/>. BHP files that include likely tenant houses are a "small group of apparently related one story brick houses" in Conestoga Township and a tenant house at the Swarr-Harnish Farm in Manheim Township.

<sup>41</sup> Robert Ensminger calls this the "Standard Pennsylvania Barn." Here the more generic term "Pennsylvania Barn" is used to emphasize all the shared characteristics rather than draw attention to subtypes.

<sup>42</sup> Huber, "Two Hundred Years of Farming in Lancaster County," 99. See also *New England Farmer* September 25, 1829 page 80 (American Periodicals Series online)

<sup>43</sup> William Frederic Worner, "Meeting of Distillers." *Journal of the Lancaster County Historical Society*. Volume 34. Lancaster, PA: Lancaster County Historical Society, 1930.

<sup>44</sup> *Lancaster Examiner and Herald* September 14, 1859; *Lancaster Intelligencer* January 4, 1848, September 11, 1849, October 16, 1849, December 4, 1849, September 3, 1850. Online at Pennsylvania Civil War Newspapers and Lancaster County Historical Society.

<sup>45</sup> Huber, "Two Hundred Years of Lancaster Farming," 108.

<sup>46</sup> Roger Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania, Region." Ph d dissertation, Geography, PSU, 1953, notes that tobacco acreage stabilized around 1919, then began a long decline.

<sup>47</sup> Frederick Shriver Klein, *Lancaster County Since 1841* (Lancaster, PA, 1955), Chapter III. Egon Cesar Corti, *A History of Smoking* (New York: Harcourt and Brace, 1932), 254; Patricia Cooper, "What this Country Needs is a Good Five-Cent Cigar," *Technology and Culture* 29 (1988): 779-807. Jordan Goodman, *Tobacco in History: the Cultures of Dependence* (London: Routledge, 1993); Jason Hughes, *Learning to Smoke: Tobacco Use in the West* (Chicago: University of Chicago Press, 2003);

<sup>48</sup> Andrew M. Frantz, "The Cause of the Present Depreciation in the Value of Real Estate in Lancaster County," *Pennsylvania Agricultural Society Annual Report*, 1889, 197-206.

<sup>49</sup> U. S. Census of Agriculture, 1880, 1919, 2002; J. B. Killebrew, "Report on the Culture and Curing of Tobacco on the United States," U. S. Bureau of the Census, 1880; Roger Chatsey Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," Ph d dissertation, Geography, Penn State University, 1953, iii. On the quality/price of Lancaster County cigars, see Willis Nissley Baer, "Economic Position of the Cigar Leaf Industry in Lancaster County, Pennsylvania," MA Thesis, University of Pennsylvania, 1929, 21-24.

<sup>50</sup> Donald B. Kraybill, *The Riddle of Amish Culture* Revised edition. (Baltimore: Johns Hopkins University Press, 1989, 2001), 335. Daniel B. Good, "The Localization of Tobacco Production in Lancaster County Pennsylvania," *Pennsylvania History* 49 # 3(July 1982): 190-200.

- 
- <sup>51</sup> W. S. Beach, "Control of Tobacco Wildfire," Penn State Agricultural Experiment Station Bulletin # 322 (August 1935), 3.
- <sup>52</sup> Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania, Region," 88.
- <sup>53</sup> Walter Kollmorgen, "The Old Order Amish of Lancaster County, Pennsylvania," in *Rural Life Studies* (Washington, DC: USDA, 1942), Penn State Special Collections.
- <sup>54</sup> Pennsylvania Agricultural Experiment Station Bulletin 30, "Tobacco Experiments," 1887, 10; William Frear and E. K. Hibshman, "Production of Cigar-Leaf Tobacco in Pennsylvania," USDA Farmers' Bulletin #416, issued 1910, revised 1921, 5-6.
- <sup>55</sup> Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," 11, 36, 53.
- <sup>56</sup> Frank R. Diffenderffer, "Our Tobacco Crop for 1879," Pennsylvania Board of Agriculture *Annual Report* 1879, 186.
- <sup>57</sup> Total farms in the county: From 5,629 in 1850 to 9,069 in 1880 to a peak of over 11,000 around 1925
- <sup>58</sup> Horace Barnes, "Early History of Tobacco," *Papers of the Lancaster County Historical Society* 45 (1941), 11.
- <sup>59</sup> William Frear and E. K. Hibshman, "Production of Cigar Leaf Tobacco in Pennsylvania."
- <sup>60</sup> Baer, "Economic Position of the Cigar Leaf Industry," 11-13.
- <sup>61</sup> Clarence Dorsey, "A Soil Survey Around Lancaster, Pennsylvania," USDA Field Operations of the Division of Soils, *Report*, 1900, 67.
- <sup>62</sup> It is also possible that since stall feeding typically occurred in fall and winter, and the census numbers were stated as of June 1, that the numbers of "other" cattle are too low. But they probably are not far off; if we take the overall estimate of 30,000 animals fattened in the county in 1890 and divide by 9,400 farms, we get only a little more than three beef animals per farm. The 1880 manuscript census shows that, not surprisingly, the total numbers of cattle "sold living" varied, from just a few to over thirty. However, it also shows that virtually every farm on the Plain engaged in beef cattle feeding. In other words, the low average numbers do not reflect a situation in which a very few large herds create the appearance of a low per-farm average. On draft horses, see *Lancaster County, Pennsylvania, The Garden Spot of the United States, the Picturesque and Historical East End* (1908; Penn State Library Digital Collections), 1; Frank B. McClain, "The Union Stock Yards and the Feeding of Cattle in Lancaster County," in H. M. J. Klein, ed., *Lancaster County, Pennsylvania: a History*, (1924; Penn State Library Digital Collections), 667-670, 955.
- <sup>63</sup> Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," 182;
- <sup>64</sup> "Culture and Curing of Tobacco in Pennsylvania," Chapter XIV, of "Culture and Curing of Tobacco in the United States," U. S. Census of Agriculture for 1880, (158-60. see also Baer, "Economic Position of the Cigar Leaf Industry in Lancaster County, Pennsylvania," 11-13.
- <sup>65</sup> Kriebel, *Seeing Lancaster County from a Trolley Window*, 6; Otto Olson, "Cigar-Tobacco Production in Pennsylvania," USDA Farmers' Bulletin 1580, (1929), 2, 7-8, said that annually 65-80,000 steers were fed and that sometimes dairy animals were used to generate manure. On grass feeding, *Lancaster County, Pennsylvania, the Garden Spot of the United States, the Picturesque and Historical East End* (1908, Penn State Digital Collections), 4.

<sup>66</sup> Pennsylvania Department of Agriculture *Annual Report*, Part 2, 266; United States Census of Agriculture, 1925. *Reports for States, with Statistics for Counties and a Summary for the United States*. (Washington, D. C., 1927), 285; *Lancaster County, Pennsylvania, the Garden Spot of the United States, the Picturesque and Historical East End* (1908, Penn State Digital Collections), 43. De Forest, *Resources and Industries of Lancaster*, 43, claimed that the output of the Lancaster Chemical Company was 10,000 tons around 1909.

<sup>67</sup> Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," 206.

<sup>68</sup> Pennsylvania Board of Agriculture *Annual Report*, 1883, 30-31, shows a table of "statistics from correspondents." Lancaster County respondents raised 30% of their dairy cows; sold 50% of their butter 10% of their cheese, and 15% of their milk outside the county. Milk was sent to Philadelphia, Baltimore, and Lancaster City.

<sup>69</sup> See Lititz Sanborn Map 1898 sheet 5. On the 1927 Lititz map, Sheet 2, North Alley creamery has expanded to be Jacob H. Stover Co. Ice Plant (with Ice Tank Room and Ice Storage building); a cinder block "Bottling Works"; and an enlarged creamery at the same site as the Garber.

<sup>70</sup> Lancaster County Agricultural Extension Archives, County Agent Report 1914, Narrative, week of May 19.

<sup>71</sup> The figures in the US Census of Agriculture do not correspond to statements made in Schneider, *Foundations in a Fertile Soil*, page 27. Lancaster County was not the leading butter county in 1890; Bradford was. The figure of 8 million gallons of milk shipped in 1890 is about right, but it is important to note that milk shipped still represented only about half of the county's total output; the remainder was made into butter on the farm.

<sup>72</sup> U. S. Census of Agriculture, 1890, Table 10, page 304. Data online at USDA website. [http://www.agcensus.usda.gov/Publications/Historical\\_Publications/1890/1890a\\_v5-09.pdf](http://www.agcensus.usda.gov/Publications/Historical_Publications/1890/1890a_v5-09.pdf) accessed April 20, 2011

<sup>73</sup> Schneider, *Foundations in a Fertile Soil*, 33. Sanborn maps show many candy and confectionary establishments. See especially: Manheim 1886, Sheet 1; Manheim 1886, Sheet 3; Manheim 1896, Sheet 1; Manheim 1896 Sheet 3; Mount Joy:1928, Sheet 14; Mount Joy 1928 Sheet 4; Lititz 1912.

<sup>74</sup> *Lancaster County, Pennsylvania, the Garden Spot of the United States, the Picturesque and Historical East End* (1908, Penn State Digital Collections), 5, 8; *Lancaster Farmer* August 1875, 114, 115. On celery culture, see Pennsylvania Agricultural Society *Annual Report*, 1884, 24-26.

<sup>75</sup> H. A. DeForest, *Resources and Industries of Lancaster, Pennsylvania* (Lancaster, PA: Lancaster Board of Trade, 1909), 47 and 8. Kriebel, *Seeing Lancaster County from a Trolley Window*, 1910, 38, says there's truck farming in East Lampeter Twp. Keyser, "Gardens and Gardening Among the Pennsylvania Germans," *Pennsylvania Folklife* 20 (Spring 1971): 2-15, notes competition among women and says men spent little time gardening. M. Luther Heisey, "The Famed Markets of Lancaster," *Papers of the Lancaster County Historical Society* LIII # 1 (1949): 1-31; *Lancaster County, Pennsylvania, The Garden Spot of the United States, the Picturesque and Historical East End*, 13-18; for evidence of corn drying, see Manheim Sanborn 1912, Sheet 9. For produce warehouses, see Manheim 1886, Sheet 1. For greenhouses, see Manheim Sanborn 1912, sheet 10, and Sheet 7. These greenhouses were all on the 1929 Sanborn maps also.

<sup>76</sup> DeForest, *Resources and Industries of Lancaster, Pennsylvania*, 3.

- <sup>77</sup> Frear, "Production of Cigar-Leaf Tobacco in Pennsylvania," 10-11.
- <sup>78</sup> "Tobacco Culture in Pennsylvania, Employment it Indirectly Affords Women," *Lancaster Farmer* June 1879, 87. Lancaster County Digitization Project.
- <sup>79</sup> Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," 213; Horace Barnes, "Early History of Tobacco," *Papers of the Lancaster County Historical Society* XLV (1941): 5-24; Orman Street, "Producing Cigar Tobacco in Pennsylvania," U. S. Department of Agriculture *Farmers' Bulletin* # 2001 (December 1938); William Frear and E. K. Hibshman, "Production of Cigar Leaf Tobacco in Pennsylvania," U. S. Department of Agriculture *Farmers' Bulletin* # 416, issued 1910, revised 1921. Stripping work is described by De Forest, *Resources and Industries of Lancaster, Pennsylvania*, 1909, 3-4. The most detailed treatment of tobacco barns is Robert Abraham Barakat, "Tobaccuary: A Study of Tobacco Curing Sheds in Southeastern Pennsylvania," Ph.D. Diss., University of Pennsylvania, 1972. The quote about school is from Heppell, 211.
- <sup>80</sup> James Frey, compiler, "Agricultural and Federal Census Schedules 1850-1880 Earl Township Lancaster County Pennsylvania." (Morgantown, PA, 2000), 152, 154.
- <sup>81</sup> A. G. Seyfert, "The Hired Boy," *The Pennsylvania German* 11 (1910): 223-224.
- <sup>82</sup> George Groff, "The Garden Spot of Pennsylvania," *The Independent*, February 1, 1894, 30; J. E. McCord, "Farm Tenancy and Lease Forms," Pennsylvania State Experiment Station Bulletin 232 (March 1929), 9.
- <sup>83</sup> Frear, "Production of Cigar Leaf Tobacco in Pennsylvania," 7-8.
- <sup>84</sup> Otto Olson, "Cigar-Tobacco Production in Pennsylvania" USDA Farmers' Bulletin 1580 (1929).
- <sup>85</sup> "Culture and Curing of Tobacco in Pennsylvania," 1880, 162.
- <sup>86</sup> Harry Smithcors Sloat, "Study of Eleven Years of Farm Account Books in Lancaster County, 1921-1931 Inclusive," MS Thesis, Pennsylvania State College, 1935, 5.
- <sup>87</sup> James Frey, compiler, "Agricultural and Federal Census Schedules 1850-1880 Earl Township Lancaster County Pennsylvania." (Morgantown, PA, 2000).
- <sup>88</sup> It is hard to know how representative these were, but they are dominant in BHP files.
- <sup>89</sup> Orman Street, "Producing Cigar Tobacco in Pennsylvania," U. S. Department of Agriculture *Farmers' Bulletin* # 2001 (December 1938), 16.
- <sup>90</sup> Frank R. Diffenderfer, "Our Tobacco Crop of 1879," *Third Annual Report of the Pennsylvania Board of Agriculture* (1879): 188-191; Frear, "Production of Cigar Leaf Tobacco in Pennsylvania," 17-18.
- <sup>91</sup> Jacob M. Frantz, "Tobacco Culture in Lancaster County," *First Annual Report of the Pennsylvania Board of Agriculture* (1877): 256-258.
- <sup>92</sup> William Woys Weaver, *Sauerkraut Yankees* (Mechanicsburg, PA: Stackpole Books), 116, 150.
- <sup>93</sup> *Lancaster Farmer* April 1884: 63.
- <sup>94</sup> de Forest's *Lancaster Resources*, 1909, says Barr has a greenhouse at 940 Columbia Ave and soon expects to open a large tract "adjacent to the city". On p 47 there's a photo of the office and greenhouse.
- <sup>95</sup> Dorsey, Clarence. "A Soil Survey Around Lancaster, Pennsylvania." USDA Field Operations of the Division of Soils, *Report*, 1900.
- <sup>96</sup> *Reports of the Transactions of the Pennsylvania State Agricultural Society*, 1882, 309.
- <sup>97</sup> Agricultural Extension Archives, County Agent Report, 1913, 1918; Pennsylvania Triennial Census, 1927

<sup>98</sup> Groff, "Garden Spot," 30; Kriebel, *Seeing Lancaster County from a Trolley Window*, 9; *Lancaster County, Pennsylvania, the Garden Spot of the United States, the Picturesque and Historical East End* (1908, Penn State Digital Collections), 11; William Riddle, *Cherished Memories of Old Lancaster – Town and Shire* (Lancaster, PA, 1910), 59; Ellis and Evans, *History of Lancaster County*, 1; "Report of the Committee on Grass and Grasses of Pennsylvania," Pennsylvania State Board of Agriculture *Annual Report*, 1883, 168-75.

<sup>99</sup> Pennsylvania Agricultural Society *Annual Report* 1885, 175-184; Casper Hiller, "Essay on Timber Trees," Pennsylvania Horticultural Association *Annual Report*, 1887, 12-14.

<sup>100</sup> Schneider, in *Foundations in a Fertile Soil*, 37, asserts that 1940 was the first year since the 18<sup>th</sup> century that farm numbers declined; but the US Agricultural census published figures show 11,457 in 1925; 9,705 in 1930; 8,446 in 1940 (Schneider's figure is 8,823); and 7,952 in 1950. The correction is made here because it is important to the interpretation: whereas Schneider implicitly attributes farm disappearances to development, the revised numbers (combined with other sources) suggest other factors at work, mainly the worldwide agricultural depression which began just after World War I.

<sup>101</sup> Gideon L. Fisher, *Farm Life and Its Changes* (Gordonville, PA, 1978), 9-17.

<sup>102</sup> Murray Wayne Fisk, "Changes in the Financial Side of Farming in Lancaster County, Pennsylvania, 1921-1950," MS Thesis, Pennsylvania State University, 1953, 110; Fisher, *Farm Life*, 71.

<sup>103</sup> Lancaster County Planning Commission, *A Report on the Physical Features and Natural Resources of Lancaster County, Pennsylvania*. Lancaster, PA: 1960, 20-23.

<sup>104</sup> Sloat, "Eleven Years of Farm Account Books," 34, 49, 53.

<sup>105</sup> Agricultural Extension Archives, County Agent Report, 1932.

<sup>106</sup> Agricultural Extension Archives, County Agent Report, 1942 and 1953.

<sup>107</sup> Agricultural Extension Archives, County Agent Report, 1922, page 19.

<sup>108</sup> Winter barley is discussed in the Agricultural Extension Archives, County Agent Report virtually every year between 1930-1950.

<sup>109</sup> Agricultural Extension Archives, County Agent Report, 1947, page 12: "Lancaster County has practically passed out of the picture as an oats growing county"

<sup>110</sup> <http://www.victoryseeds.com/catalog/vegetable/corn/corn.html> accessed January 7, 2010

<sup>111</sup> Schneider's *Foundations in a Fertile Soil*, page 32, states that hybrid corn seed was in use "by the 1920s." There is no evidence for widespread hybrid corn use this early, either in the agricultural extension reports or in the secondary literature. Deborah Fitzgerald, author of the definitive history of hybrid corn, notes that commercially available hybrid seed did not appear most places until at least 1937. Deborah Fitzgerald, *The Business of Breeding: Hybrid Corn in Illinois, 1890-1940*. (Ithaca, NY, 1990). Lancaster Sure Crop is discussed in the Agricultural Extension Archives, County Agent Reports for 1929 and 1934. The reports for 1938, 1939, 1940, and 1941 discuss hybrids.

<sup>112</sup> Agricultural Extension Archives, County Agent Report, 1924, pages 13-15; 1925, pages 12-15.

<sup>113</sup> Truck crops are mentioned in the Agricultural Extension Archives, County Agent Reports for 1930, 1931, 1932, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, and 1953.

<sup>114</sup> Agricultural Extension Archives, County Agent Report, 1928.

<sup>115</sup> Lititz Bicentennial Committee, *Lititz, 1756-1956* (no publication information), 1956, 15-16.

- <sup>116</sup> M. Luther Heisey, "The Famed Markets of Lancaster," *Papers of the Lancaster County Historical Society* LIII # 1 (1949): 1-31.
- <sup>117</sup> Agricultural Extension Archives, County Agent Report, 1946, 1947, 1948, 1950, 1954, 1955.
- <sup>118</sup> Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," 282.
- <sup>119</sup> William Frear and E. K. Hibshman, "The Production of Cigar-Leaf Tobacco in Pennsylvania," *USDA Farmers' Bulletin* 416 (1921), 9.
- <sup>120</sup> Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," Chapter IV and V.
- <sup>121</sup> Alan L. Olmstead and Paul W. Rhode, "An Impossible Undertaking: The Eradication of Bovine Tuberculosis in the United States." *Journal of Economic History*, Vol. 64, No. 3 (Sep., 2004), 734-772.
- <sup>122</sup> Agricultural Extension Archives, County Agent Report: 1926, page 32-33; 1932; Schneider, *Foundations in a Fertile Soil*, 25-6. Lower grade milk and candy making is further discussed in the Great Valley context document.
- <sup>123</sup> Paul Rhode and Alan Olmstead, "Not on My Farm! Resistance to Bovine Tuberculosis Eradication in the United States," *The Journal of Economic History*, Vol. 67, No. 3 (September 2007): 768-809.
- <sup>124</sup> Stevenson Fletcher, *Pennsylvania Agriculture and Country Life* volume 2, 1840-1940 (Harrisburg, PA, 1955), 210.
- <sup>125</sup> Fletcher, *Pennsylvania Agriculture and Country Life* volume 2, 209; Alan L. Olmstead and Paul W. Rhode, "An Impossible Undertaking: The Eradication of Bovine Tuberculosis in the United States." *Journal of Economic History*, Vol. 64, No. 3 (Sep., 2004), 761.
- <sup>126</sup> Agricultural Extension Archives, County Agent Report, 1951; Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," 325.
- <sup>127</sup> Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania Region," 327. See also Fisk, "Changes in the Financial Side of Farming," 79-83, and Lancaster County Soil Survey for 1900, 67.
- <sup>128</sup> Agricultural Extension Archives, County Agent Report, 1920, 1922, 1934, 1936, 1938, 1939, 1944; Lancaster *Farming*, July 11, 1959.
- <sup>129</sup> Agricultural Extension Archives, County Agent Report, 1956, page 32; Agricultural Extension Archives, County Agent Report, 1953, 1954.
- <sup>130</sup> Agricultural Extension Archives, Home Economics Extension Agent Report, 1935, 6; 1938; 1939, 7; 1942; 1945; 1950 Census.
- <sup>131</sup> Agricultural Extension Archives, County Agent Report, 1917.
- <sup>132</sup> H. B. Josephson, "A Farm Machinery Survey of Selected Districts in Pennsylvania," *Pennsylvania Agricultural Experiment Station Bulletin* # 237, 1929; Fisk, "Changes in the Financial Side of Farming," 68.
- <sup>133</sup> Berenice Steinfeldt, *The Amish of Lancaster County* (Lancaster, PA, 1940), 7; David Weaver-Zercher, *The Amish in the American Imagination* (Baltimore: Johns Hopkins University Press, 2001).
- <sup>134</sup> Agricultural Extension Archives, County Agent Report, 1958, page 57.
- <sup>135</sup> Agricultural Extension Archives, Home Economics Extension Agent Report, 1959.
- <sup>136</sup> Agricultural Extension Archives, County Agent and Home Extension Agent Report, 1956, 1958. Heppell, "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster,

Pennsylvania Region," 311 and 260; Lancaster *Farming* June 29, 1956; *Lancaster Labor Market Letter*, 1959; Agricultural Extension Archives, County Agent Report, 1941, 1942, 1943, 1944, 1947.

<sup>137</sup> M. C. Betts and M. A. R. Kelley, "Suggestions for the Improvement of Old Bank Dairy Barns," USDA Circular # 166 (June 1931), 1, 5, 4. Agricultural Extension Archives, County Agent Report, 1949, 1950, each mention the impact of regulations on barn design.

<sup>138</sup> 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.

<sup>139</sup> Stevenson W. Fletcher, *Pennsylvania Agriculture and Country Life*. Two volumes. (Harrisburg: Pennsylvania Historical and Museum Commission, 1950–1955), Volume 2, 217-219.

<sup>140</sup> Plans referred to are from *Farm Building and Equipment Plans and Information Series*, 1929.

<sup>141</sup> Agricultural Extension Archives, County Agent Report, 1924, page 36; 1928, page 31.

<sup>142</sup> H. B. Josephson, et al. "A Farm Machinery Survey of Selected Districts in Pennsylvania." Pennsylvania Agricultural Experiment Station Bulletin # 237, 1929.

<sup>143</sup> Agricultural Extension Archives, County Agent Report, 1926, 1928, 1930, 1932, 1940

<sup>144</sup> C. S. Platt, "Battery Brooding," *Farm Journal*, January 1930, 22.

<sup>145</sup> D. Kennard, "A New Deal for Chickens," *Farm Journal*, July 1933, 5.

<sup>146</sup> Platt, "Battery Brooding."

<sup>147</sup> 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.

<sup>148</sup> 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.

<sup>148</sup> The Bradford County Agricultural Extension Agent's Report for 1941 mentions BradCo's role in supplying building plans.

<sup>149</sup> Agricultural Extension Archives, County Agent Report, 1929, 1948, 1949, 1950, 1959.

<sup>150</sup> *Lancaster Farming*, February 22, 1957.

<sup>151</sup> Agricultural Extension Archives, County Agent Report, 1938, 1955; "My land is the Way I want It," *Lancaster Farming* July 11, 1959, cover story.

<sup>152</sup> Agricultural Extension Archives, County Agent Report, 1931, 1941, 1952.

<sup>153</sup> *Lancaster Farming*, December 16, 1955, page 12, noted that 70% of Lancaster County farms had phones, 86% electricity, 33% television, and 68% running water.

<sup>154</sup> Note that while the *buildings* represent an identifiable cultural tradition, the *owners or occupants* may not have necessarily shared 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.

<sup>155</sup> 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.

<sup>156</sup> NR Bulletin How to Apply the National Register Criteria for Evaluation, p 17.

---

<sup>157</sup>Historic Farming Resources of Lancaster County, MPDF, 1994.

<sup>158</sup> 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).

<sup>159</sup> “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.

<sup>160</sup> “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](http://hpd.dnr.state.ga.us/assets/documents/tilling_the_earth.pdf)

<sup>161</sup> Ibid.

<sup>162</sup> Ibid.

<sup>163</sup> Ibid.

## Bibliography

1798 Direct Tax Manuscripts for Lancaster County. Penn State Libraries Microform Collections and University of Delaware digitization at

<http://dspace.udel.edu:8080/dspace/handle/19716/1340>.

“Agricultural Condition of Pennsylvania,” *Farmer’s Register* June 30, 1842, 273. American Periodical Series online.

Baer, Willis Nissley. “Economic Position of the Cigar Leaf Industry in Lancaster County, Pennsylvania.” MA Thesis, University of Pennsylvania, 1929.

Barakat, Robert Abraham. “Tobaccuary: A Study of Tobacco Curing Sheds in Southeastern Pennsylvania,” Ph.D. Dissertation, University of Pennsylvania, 1972.

Barnes, Horace. “Early History of Tobacco.” *Papers of the Lancaster County Historical Society* 45 (1941): 5-24.

Beach, W. S. “Control of Tobacco Wildfire.” Penn State Agricultural Experiment Station Bulletin # 322 (August 1935).

Betts, M. C. and M. A. R. Kelley. “Suggestions for the Improvement of Old Bank Dairy Barns.” USDA Circular # 166 (June 1931).

Bidwell, Percy Wells, and John Falconer. *History of Agriculture in the Northern States 1620-1840*. New York: Peter Smith, 1941.

Boyd, William H. *Boyd’s Lancaster County Business Directory*. Lancaster, PA: Sprenger and Westhaeffer, 1859.

Bucher, Robert. “Grain in the Attic.” *Pennsylvania Folklife* 13 (Winter 1962-63): 7-15

Lancaster Plain narrative, p. 198

Bucher, Robert C. and Alan G. Keyser, "Thatching in Pennsylvania," *Der Reggeboge* 16 (1982): 1-23.

Chen, Kuan-Y. "Agricultural Production in Pennsylvania, 1840 to 1950." Ph.D. thesis, Pennsylvania State University, Agricultural Economics/Rural Sociology, 1954.

Conygham, Redmond. "On the Early Settlement of the Valley of the Pequea," 1842, PSU Libraries digital collections.

Cooper, Patricia. "What this Country Needs is a Good Five-Cent Cigar." *Technology and Culture* 29 (1988): 779-807.

Cooper, Patricia. *Once a Cigar Maker: Men, Women, and Work Culture in American Cigar Factories, 1900-1919*. Urbana: University of Illinois Press, 1987.

Corti, Egon Cesar. *A History of Smoking*. New York: Harcourt and Brace, 1932.

Coxe, Tench. *View of the U. S. of America in a Series of Papers...1794*.

Cummings, Luther P. and Benson Rohrbeck. *Garden Spot Trolleys*. West Chester, PA, privately printed, 1977.

Deforest, H. A. *Resources and Industries of Lancaster, Pennsylvania*. Lancaster, PA: Lancaster Board of Trade, 1909.

Diffenderffer, Frank R. "Our Tobacco Crop for 1879." Pennsylvania Board of Agriculture *Annual Report* 1879.

Dorsey, Clarence. "A Soil Survey Around Lancaster, Pennsylvania." USDA Field Operations of the Division of Soils, *Report*, 1900.

Ellis, Franklin, and Samuel Evans, *History of Lancaster County Pennsylvania...* Philadelphia: Ensign and Everts, 1883.

Lancaster Plain narrative, p. 199

Eshleman, H. Frank. "Our County's Introduction of Intensive Agriculture to the United States," *Papers Read Before the Lancaster County Historical Society* XXXIII, no. 3 (1929): 27-33.

Falk, Cynthia. *Architecture and Artifacts of the Pennsylvania Germans, Constructing Identity in Early America*. University Park, PA: The Pennsylvania State University Press, 2008.

Fegley, H. Winslow. *Farming, Always Farming*. Birdsboro, PA: The Pennsylvania German Society, 1986.

Fisher, Gideon L. *Farm Life and Its Changes*. Gordonville, PA, 1978.

Fisher, Henry L. "Harvesting," in *Olden Times: Or Rural Life Some Fifty Years Ago, and Other Poems*. York, PA: Fisher Brothers, 1888, 87-115.

Fisk, Murray Wayne. "Changes in the Financial Side of Farming in Lancaster County, Pennsylvania, 1921-1950." MS Thesis, Pennsylvania State University, 1953.

Fitzgerald, Deborah. *The Business of Breeding: Hybrid Corn in Illinois, 1890-1940*. Ithaca, NY, 1990.

Fletcher, Stevenson. *Pennsylvania Agriculture and Country Life*. Two volumes. Harrisburg, PA, 1950-1955.

"For the American Farmer," *American Farmer* February 25, 1820, 48; American Periodicals Series online.

Frantz, Jacob M. "Tobacco Culture in Lancaster County." *First Annual Report of the Pennsylvania Board of Agriculture* (1877): 256-258.

Frear, William, and E. J. Haley. "Tobacco Experiments." Penn State Agricultural Experiment Station Bulletin # 30 (January 1895).

Frear, William and E. K. Hibshman. "Production of Cigar-Leaf Tobacco in Pennsylvania." USDA Farmers' Bulletin #416. Originally issued 1910, revised 1921.

Lancaster Plain narrative, p. 200

Frey, James compiler. "Agricultural and Federal Census Schedules 1850-1880 Earl Township Lancaster County Pennsylvania." Morgantown, PA, 2000.

Garner, Wightman. *The Production of Tobacco*. Philadelphia: Blakiston Company, 1946.

Garner, W. W. *Tobacco Curing*. USDA Farmers' Bulletin 523 (issued February 18, 1918).

"Gibbons, Phebe Earle. '*Pennsylvania Dutch, and other Essays*. Philadelphia: Lippincott, 1874.

Glass, Joseph. "Agricultural Regions of Lancaster County, Pennsylvania," MS Thesis, Department of Geography, Penn State University, 1949.

Good, Daniel B. "The Localization of Tobacco Production in Lancaster County Pennsylvania." *Pennsylvania History* 49 # 3(July 1982): 190-200.

Goodman, Jordan. *Tobacco in History: the Cultures of Dependence*. London: Routledge, 1993.

"Grazing in Eastern Pennsylvania," *The Cultivator* February 1846, 63. American Periodicals Series online.

Groff, George. "The Garden Spot of Pennsylvania." *The Independent*, February 1, 1894. American Periodicals Series online.

Grubb, Farley. "Immigrant Servant Labor: Their Occupational and Geographic Distribution in the Late Eighteenth Century Mid Atlantic Economy." *Social Science History* 9 (1985): 249-276.

Heisey, M. Luther. "The Famed Markets of Lancaster." *Papers of the Lancaster County Historical Society* 53 # 1 (1949): 1-31.

Heppell, Roger. "Agricultural Geography of the Cigar Tobacco Industry of the Lancaster, Pennsylvania, Region." Ph d dissertation, Geography, Penn State University, 1953.

Historic Preservation Trust of Lancaster County. *Lancaster County Architecture, 1700-1850*. Lancaster, PA, 1992.

Lancaster Plain narrative, p. 201

Hostetler, John. *Land Use, Ethics, and Agriculture in Lancaster County* (Special report for the Pennsylvania Department of Transportation, 1988.) Penn State Special Collections Library.

Huber, Levi. "Two Hundred Years of Farming in Lancaster County," *Journal of the Lancaster County Historical Society* 34(1930).

Hughes, Jason. *Learning to Smoke: Tobacco Use in the West*. Chicago: University of Chicago Press, 2003.

Hunter, Brooke. "Rage for Grain: Flour Milling in the Mid-Atlantic 1750-1815," Ph d Dissertation, History, University of Delaware, 2002.

"Interesting Travels in America," *The Port-Folio* October 9, 1802, 314 (American Periodicals Series online.

Jensen, Joan M. *Loosening the Bonds, mid-Atlantic Farm Women, 1750-1850*. New Haven, CT: Yale University Press, 1986.

Josephson, H. B. "A Farm Machinery Survey of Selected Districts in Pennsylvania." Pennsylvania Agricultural Experiment Station Bulletin # 237, 1929.

Kennard, D. C. "A New Deal for Chickens." *Farm Journal*, July 1933, 5.

Kennard, D. C. "Revolution in Hen-Coops." *Farm Journal*, March 1932, 14

Kennedy, Michael V. "Cash for His Turnups": Agricultural Production for Local Markets in Colonial Pennsylvania, 1725-1783." *Agricultural History* 74, No. 3 (Summer, 2000): 587-608.

Keyser, Alan G. and William P. Stein. "The Pennsylvania German Tri-Level Ground Barn." *Quarterly of the Pennsylvania German Society* 9 (December 1975): 1-25.

Keyser, Alan G. "Gardens and Gardening Among the Pennsylvania Germans." *Pennsylvania Folklife* 20 (Spring 1971): 2-15.

Lancaster Plain narrative, p. 202

Killebrew, J. B. "Report on the Culture and Curing of Tobacco on the United states," U. S. Bureau of the Census, 1880. See especially Chapter XIV, which concerns Pennsylvania.

Klein, Frederic Shriver. *Lancaster County Since 1841*. Lancaster, PA: Lancaster County National Bank, 1955.

Koenig, Nathan. "Henhouses from Left-Overs." *Farm Journal*, June 1930: 31-32.

Kollmorgen, Walter. "The Old Order Amish of Lancaster County, Pennsylvania." in *Rural Life Studies* (Washington, DC: USDA, 1942), Penn State Special Collections.

Kriebel, H. W. *Seeing Lancaster County from a Trolley Window*. Lititz, PA: the Express Printing Company, 1910.

*Lancaster County, Pennsylvania, The Garden Spot of the United States, the Picturesque and Historical East End*. 1908; Penn State Library Digital Collections.

Lancaster County Historical Society Digitization Project, <http://lcdp.wetpaint.com/> Digitized Lancaster County periodicals including the *Lancaster Farmer*, *Lancaster Intelligencer*, and Lancaster County Planning Commission. *A Report on the Physical Features and Natural Resources of Lancaster County, Pennsylvania*. Lancaster, PA: 1960.

Lancaster County Planning Commission. *Lancaster's Heritage: An Historical Preservation Study for Lancaster County*. Lancaster, PA, 1972

Lancaster County Bicentennial Committee, Conestoga Valley Chapter. *Conestoga Valley 1776 Bicentennial 1776*. 1976.

*Lancaster Journal*.

*Lancaster Farming*, digitized issues available through Penn State Libraries Digital Collections.

<http://digitalnewspapers.libraries.psu.edu/Default/Skins/lancasterfarming/Client.asp?skin=lancasterfarming&AW=1264801454165&AppName=2>

Lancaster Plain narrative, p. 203

*Lancaster Labor Market Letter* 1954-1960. Bureau of Employment Security.

Lanier, Gabrielle. *The Delaware Valley in the Early Republic*. Baltimore: Johns Hopkins University Press, 2005.

Lemon, James. *The Best Poor Man's Country*. Baltimore: Johns Hopkins University Press, 1972.

Lemon, James. "Household Consumption in Eighteenth-Century America and its Relationship to Production and Trade: the Situation Among Farmers in Southeastern Pennsylvania," *Agricultural History* 41 (1967): 59-70

Lemon, James. "The Agricultural Practices of National Groups in Eighteenth-Century Southeastern Pennsylvania," *Geographical Review* LVI (October 1966): 467-496.

Lestz, Gerald. *A Brief History of Transportation in Lancaster County*. Ephrata, PA: Science Press, 1979.

Lititz Bicentennial Committee. *Lititz, 1756-1956* (no publication information), 1956.

Lord, Arthur C. "The Pre-Revolutionary Agriculture of Lancaster County Pennsylvania." *Proceedings of the Lancaster County Historical Society* (Hilarymas 1975): 23-42.

Loose, John Ward Willson. *The Heritage of Lancaster*. Woodland Hills, CA: Windsor Productions, 1978.

Lord, Arthur C. "Barns of Lancaster County: 1798." *Journal of the Lancaster County Historical Society* 77 (1973): 26-40

McClain, Frank B. "The Union Stock Yards and the Feeding of Cattle in Lancaster County." in H. M. J. Klein, ed., *Lancaster County, Pennsylvania: a History*. 1924; Penn State Library Digital Collections.

McCord, J. E. "Farm Tenancy and Lease Forms." Pennsylvania State Experiment Station Bulletin # 232 (March 1929).

Lancaster Plain narrative, p. 204

Mombert, J. I. *An Authentic History of Lancaster County, in the State of Pennsylvania.*

Lancaster, 1869.

Nash, Gary and Jean Soderlund. *Freedom by Degrees: Emancipation in Pennsylvania and its Aftermath.* New York: Oxford University Press, 1991.

Oakes, Elinor F. "A Ticklish Business: Dairying in New England and Pennsylvania, 1750-1812." *Pennsylvania History* 1980 47(3): 195-212.

Olmstead, Alan L. and Paul W. Rhode. "An Impossible Undertaking: The Eradication of Bovine Tuberculosis in the United States." *Journal of Economic History* Vol. 64, No. 3 (September 2004): 734-772.

Olson, Otto. "Cigar-Tobacco Production in Pennsylvania." USDA Farmers' Bulletin #1580 (1929).

"On the Pennsylvania Mode of Getting Out Clover Seed," *American Farmer* January 12, 1820, 42. American Periodicals Series Online.

*Pennsylvania Gazette.* Digitized version available through Accessible Archives.

Pendleton, Philip E. *Oley Valley Heritage: The Colonial Years, 1700-1775.* Birdsboro, PA: The Pennsylvania German Society, 1994.

Pennsylvania Agricultural Cooperative Extension Records for Lancaster County. 1913-1960.

Penn State Libraries Special Collections.

Platt, C. S. "Battery Brooding." *Farm Journal* January 1930: 22.

Platt, C. S. "Four Weeks in Batteries." *Farm Journal* December 1930: 11

Preston, Samuel. "Gardening of the Germans in Pennsylvania," *New England Farmer* September 25, 1829, 80. American Periodicals Series online.

Lancaster Plain narrative, p. 205

“Report of the Committee on Grass and Grasses of Pennsylvania.” Pennsylvania State Board of Agriculture *Annual Report*, 1883, 168-75.

Riddle, William. *Cherished Memories of Old Lancaster – Town and Shire*. Lancaster, PA, 1910.

Rupp, Daniel I. *History of Lancaster County*. Lancaster, 1844.

Salinger, Sharon. *'To Serve Well and Faithfully': Labor and Indentured Servants in Pennsylvania, 1682-1800*. New York: Cambridge University Press, 1987.

Sanborn Fire Insurance Company Maps for Lititz, Manheim, Washington Boro, and Mount Joy. Penn State Libraries Map Room.

Seyfert, A. G. “The Hired Boy.” *The Pennsylvania German* 11 (1910): 223-224.

Shammas, Carole. "How Self-Sufficient Was Early America?" *Journal of Interdisciplinary History* XIII (Autumn 1982): 247-272.

Simler, Lucy. "Tenancy in Colonial Pennsylvania: the Case of Chester County." *William and Mary Quarterly* 3d ser., 43, No. 4 (October, 1986): 542-569

Schneider, David. *Foundations in a Fertile Soil, Farming and Farm Buildings in Lancaster County, Pennsylvania*. Historic Preservation Trust of Lancaster County, 1994.

Sloat, Harry Smithcors. “Study of Eleven Years of Farm Account Books in Lancaster County, 1921-1931 Inclusive.” MS Thesis, Pennsylvania State College, 1935.

Steinfeldt, Berenice. *The Amish of Lancaster County*. Lancaster, PA, 1940.

Stoll, Steven. *Larding the Lean Earth, Soil and Society in Nineteenth-Century America*. New York, 2002

Street, Orman. “Producing Cigar Tobacco in Pennsylvania.” U. S. Department of Agriculture *Farmers’ Bulletin* # 2001 (December 1938).

Lancaster Plain narrative, p. 206

Strohm, John, and Herbert Hack, "The Conestoga Horse." *Papers Read before the Lancaster County Historical Society* (1940).

Thompson, James Westfall. *History of Livestock Raising in the US, 1607-1860*. USDA, Agricultural History Series # 5, November 1942.

"Tobacco Culture in Pennsylvania, Employment it Indirectly Affords Women," *Lancaster Farmer* June 1879, 87. Lancaster County Digitization Project.

United States Census of Agriculture, 1925. *Reports for States, with Statistics for Counties and a Summary for the United States*. (Washington, D. C., 1927).

United States Census of Agriculture, 1850, 1880.

Pennsylvania Triennial Census, 1927.

United States Patent Office Annual Reports, Agriculture, 1844 to 1863.

Walbert, David. *Garden Spot: Lancaster County, the Old Order Amish, and the Selling of Rural America*. New York: Oxford University Press, 2002.

Walzer, John. "Colonial Philadelphia and its Backcountry." *Winterthur Portfolio* 7 (1971): 161-173.

Weaver, William Woys. *Sauerkraut Yankees*. Second edition. Mechanicsburg, PA: Stackpole Books, 2002.

Weaver-Zercher, David. *The Amish in the American Imagination*. Baltimore: Johns Hopkins University Press, 2001.

White, J. W. "Lime Requirements of Pennsylvania Soils." Penn State Agricultural Experiment Station Bulletin # 164 (July 1920).

<http://www.victoryseeds.com/catalog/vegetable/corn/corn.html> accessed January 7, 2010