Agricultural Resources of Pennsylvania, c. 1700-1960

Great Valley Historical Agricultural Region, 1750-1960

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Conceptualization: Historical Farming Systems and Historic Agricultural Regions

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

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

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

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

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

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

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

Identification of Historic Agricultural Regions

Mapping done by agricultural economists in the early twentieth 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 twentieth century production patterns. However, the agricultural economists were mainly interested in production and markets; they did not take into account other important factors which shaped the landscape, especially ethnicity, labor patterns, and land tenure. For this cultural and social data, cultural geographers' work has proven valuable, because it maps information on settlement patterns, building types, ethnic groups, and even speech patterns. And finally, new maps of farm tenancy were generated for this report. Examples of these maps are reproduced below. Together, these resources were used to outline regions that allow us to avoid a "one size fits all" approach on the one hand, and the over-detailed focus on a single farm on the other.

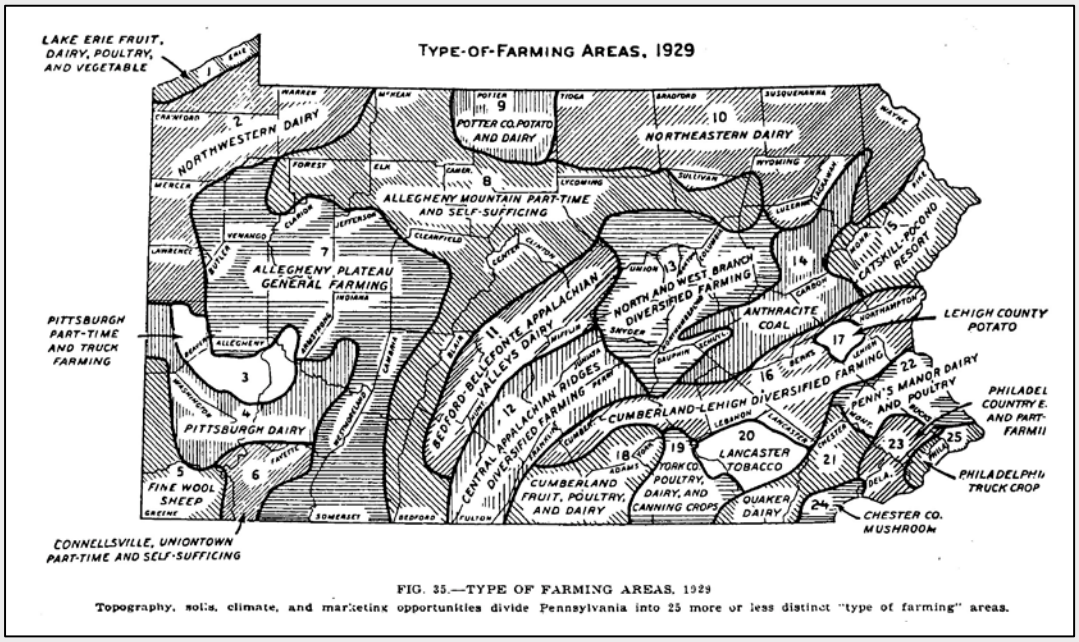
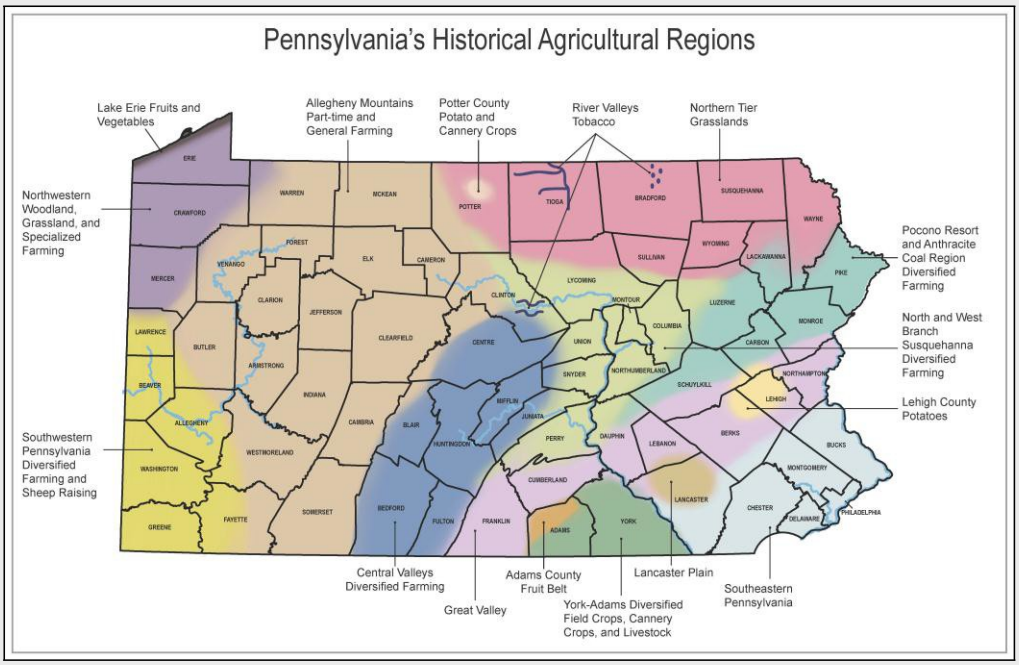


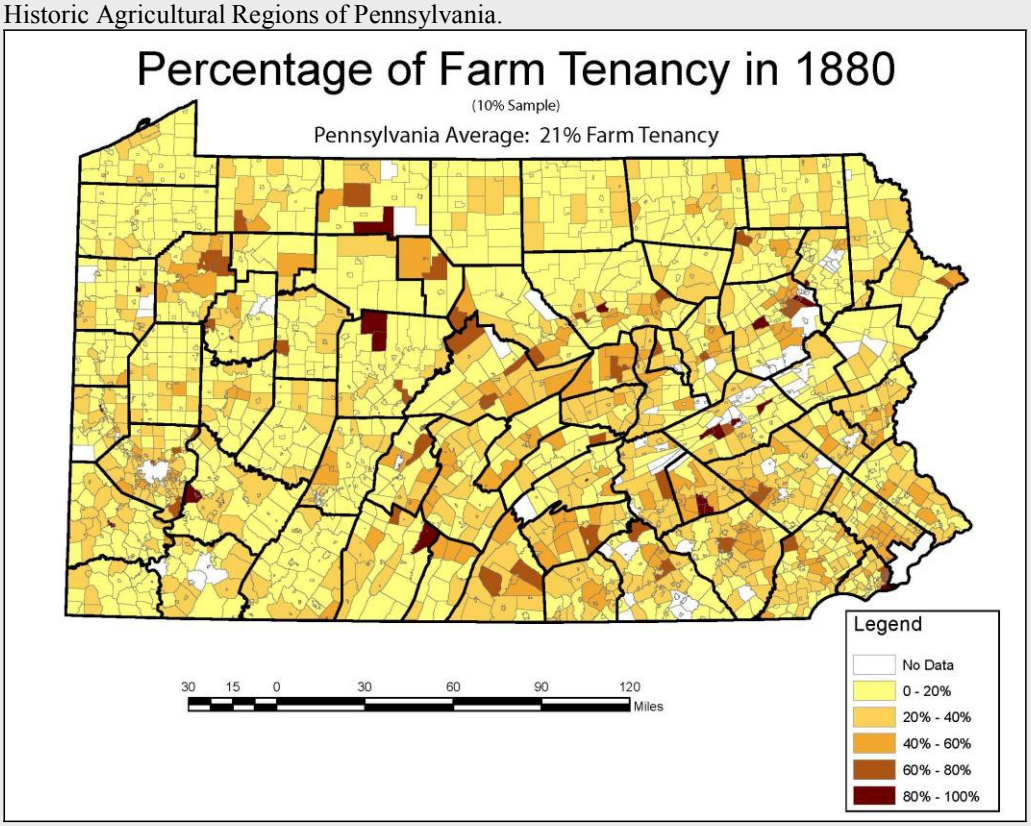
FIG. 35.—TYPE OF FARMING AREAS, 1929

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

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



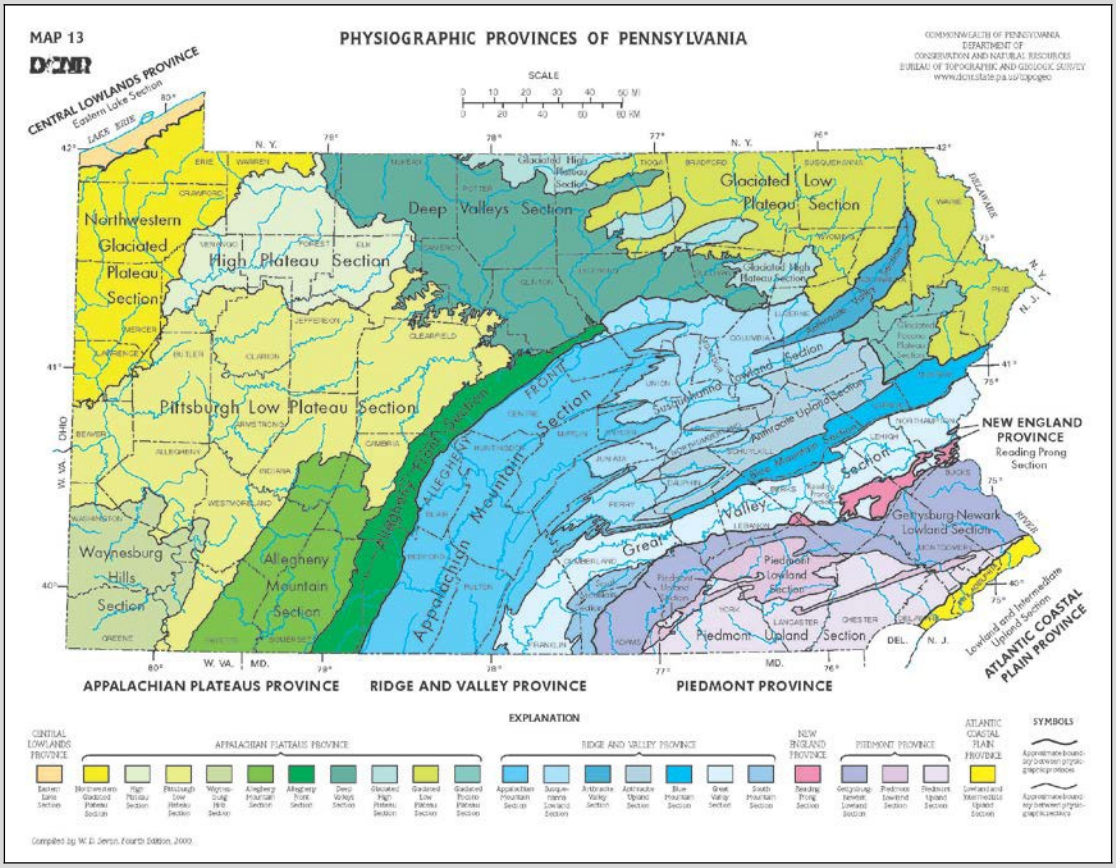
Historic Agricultural Regions of Pennsylvania.



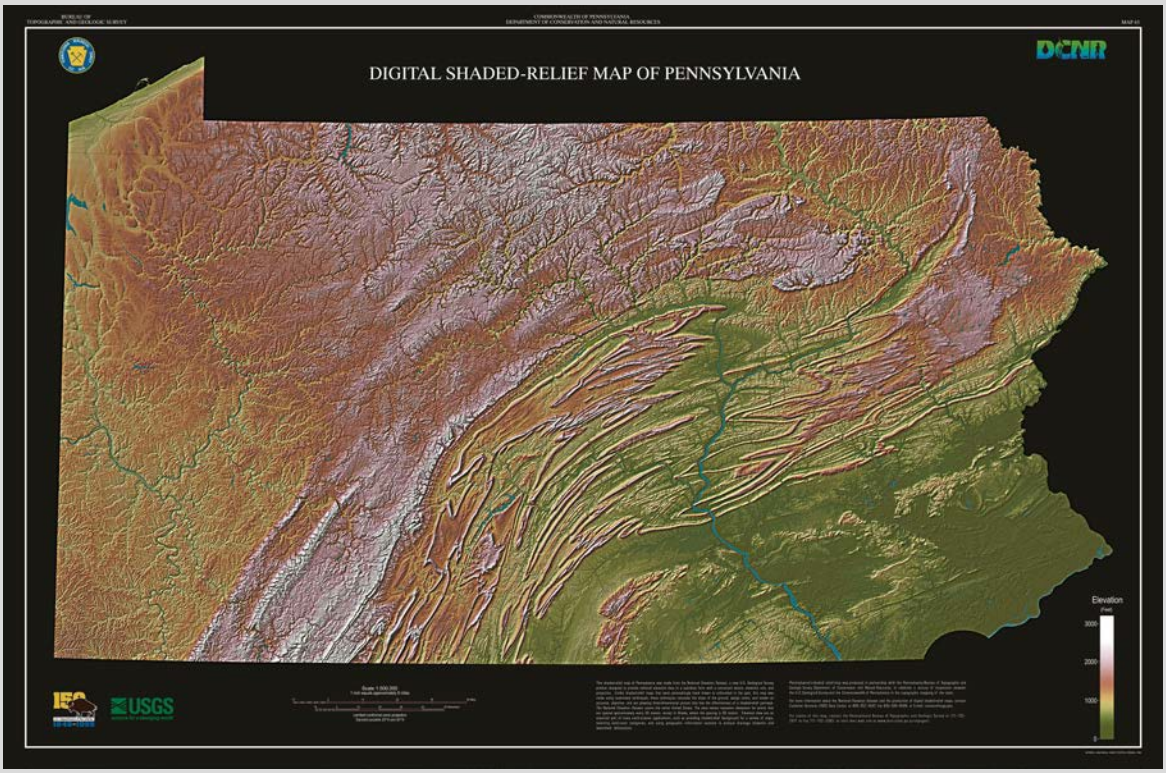
Share Tenants as a percentage of all farmers, 1880.

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

Location



Map of Pennsylvania's physiographic provinces, showing the Great Valley section. DCNR Map 13.



Relief map of Pennsylvania. The Great Valley is clearly visible. DCNR Map 65.

Pennsylvania's "Great Valley" is a broad, relatively level valley which runs from Northampton County in the northeast, in a rough arc westward through Lehigh, Berks, Lebanon, southern Dauphin, Cumberland, and Franklin Counties, turning southward and continuing across the state line. Some geographers treat it in its own right; others consider it as part of the Ridge and Valley province. In either case, all recognize that it is not confined to Pennsylvania; it becomes the "Shenandoah" Valley in Virginia, and extends northeast into New Jersey. The Great Valley is bounded on the north by long, narrow, steep ridges, penetrated by gaps and given various names along its route. On the south, South Mountain forms a sharp boundary, and a band of lesser hills separates the Great Valley from northern Bucks, Montgomery, Chester, Lancaster, and York Counties. The Great Valley is between 10 and 25 miles wide, and extends about 150 miles in Pennsylvania. Traditionally, within this larger region the "Lehigh Valley" comprises the eastern end; the "Lebanon Valley" the flat area from Reading to Harrisburg; and the "Cumberland Valley" from the Susquehanna to the Maryland line.[1]

The narrative considers Franklin, Cumberland, and Lebanon Counties to lie wholly in the Great Valley. However, northern Northampton County probably fits better with the

Pocono-Anthracite region; southern Berks with Southeastern Pennsylvania; and northern Dauphin with the North and West Branch Susquehanna Region. Northwestern Lehigh County, a notable potato growing region historically, has its own separate narrative.

Climate, Soils, and Topography

Climatic conditions in this large area vary. The growing season ranges from about 121 to 180 days, but averages around 150 in most places. Annual average precipitation ranges from 40 to 42 inches. Mean annual temperatures are in the low 50s Fahrenheit. Summers are relatively hot and winters cool. Important waterways within the Valley include the Delaware River, on its eastern edge; the Lehigh; the Schuylkill; and the Susquehanna and tributaries. Most run across the valley, but the tributaries (such as the Conodoguinet in Cumberland County) often run along it. Soils are alfisols and ultisols. One distinguishing feature in most of the valley is that limestone is the parent material. Sandstone and shale are the other important parent rocks. According to the Penn State online "Agronomy Guide," in the Ridge and Valley region the limestone soils "are usually deep, well drained, have high root zone available water-holding capacity, and have few rock fragments. The shale-derived soils are less productive because of their acidic nature, steep slopes, and generally low root zone available water-holding capacity. The soils in the valleys are on level or undulating land, and erosion potential is low to moderate. The valley soils are used intensively for agriculture."[2] The two most important agricultural soil associations in the valley are the Hagerstown-Duffield and Berks-Weikert, which are limestone and shale soils respectively.[3]

Since the Valley's defining features are topographical, topography has already been discussed under "location" above.

Historical Farming System

Mid-Eighteenth to Early Nineteenth Century: Diversified Small-Scale Farming and Wheat for Export

The land lying within the Great Valley had been acquired by 1737, and pockets were well settled by 1760, especially in areas now covering southern Dauphin, Lebanon, and Berks Counties. These include places such as Tulpehocken region in Berks/Lebanon, the Reading area in Berks County (especially the Oley Valley, just on the Great Valley's edge), and the region around Carlisle in Cumberland County. After the French and Indian Wars, more and more people followed the corridor and filled it up. By 1813 the present county boundaries were set with the creation of Lehigh County in 1812 and Lebanon County the following year. The population in the valley came from varied backgrounds. The British Isles were well represented, with English, Welsh, and most notably Scots-Irish people. Around 1800, the Scots-Irish still dominated in the western portion of the valley, in Cumberland and Franklin Counties. French Huguenots, Swedenborgians, and Mennonites came from the Continent. German-speaking people from the Rhine Valley and Switzerland came to Pennsylvania beginning around 1720 with the immigration peaking around the time of the Revolution. During this time period, they slowly gained in their proportion of the rural population in the region. By 1800, geographer Mark Hornberger estimates, German-speakers comprised over 65 percent of the population in most of Berks and Northampton Counties, with the percentage diminishing further westward. In many Cumberland County townships, for example, more than a third of the people came from English backgrounds and another fifth were Scots-Irish or Irish.[4]

Transport corridors were rudimentary during this period. Reading and Easton were connected by road, and the Schuylkill River connected Berks County to Philadelphia for part of the year. Similarly, the Susquehanna was seasonally navigable. By the late eighteenth century, a road ran west through the valley from Reading to Harrisburg and on down through Chambersburg.[5]

Products, Mid-Eighteenth to Early Nineteenth Century

Land distribution occurred in a protracted and complicated process. Some holdings were quite large—over a thousand acres—and slowly these were broken up into smaller parcels and sold for farms. Still, it was not unusual for a landowner to possess 200 or 300 acres in these early years. Clearing proceeded steadily, yet it took a long time, so crop acreage might only be 20 or 30 acres, plus some meadow land and orchard land. Crops were generally not rotated; instead, land was allowed to lie fallow periodically. These basic facts underlie analysis of production and trade patterns.[6]

Early farm production in the Great Valley region was quite diverse, but nonetheless patterns do emerge. Commentators during the colonial and early national periods mentioned wheat, buckwheat, rye, oats, and barley as typical small grains. Some sources mentioned spelt, an Old World grain. Within this broad list, rye was as important as wheat in Berks, Lebanon, Lehigh, and Northampton Counties, while west of the Susquehanna total wheat production probably surpassed rye. (Accurate figures are not available before 1840, so an assumption is made based on the 1840 census data plus earlier observers' comments.) This difference can be attributed partly to cultural preferences, and also to differences in soils. In this period, the eastern counties were much more heavily Pennsylvania German than were those west of the river. An article in the *Farmer's Register* noted that in Lehigh County, the Pennsylvania Germans much preferred rye bread, and also fed rye to animals.[7] Rye straw was also prized for roof thatching. A second reason why wheat gained the upper hand in the western counties was probably that they had more of the favorable Hagerstown soils. Regardless of proportions, wheat was important throughout the region, especially in terms of its potential for generating income. As grain or flour, it found its way to mills and markets, often ending up in Philadelphia or Baltimore and beyond. As whiskey, it brought greater profits to farmers distant from markets. (This was also true for corn.) This is an important factor; unlike farms in the southeast, most farms in the Great Valley were still poorly connected to markets at this time. Corn (maize) was grown, but its importance varied before 1800, after which it became much more common. Oats was important as a feed crop, and small quantities of barley supplied brewing needs.

Fiber crops occupied an important place in the farm economy in the "Age of Homespun." Flax and hemp were most often mentioned. Potatoes, cabbage, turnips, and many other garden crops fed humans and animals. By the end of the period, clover and timothy hay had begun to be deliberately planted. Orchards were planted immediately and within a generation, families were well supplied with fruits. Apples were the mainstay, yielding not only fresh fruit but dried fruit, vinegar, cider, apple butter, and hard cider. Historian Michael Kennedy has noted that besides the obvious outlets in major port cities, farm markets developed quite early at local mills and ironworks. These were well distributed throughout the region. Kennedy mentions beans, onions, wood, veal, parsnips, venison, cucumbers, molasses, greens, peas, leather, limestone, tallow, wax, straw, hops, hides, and feathers as items that were traded in these rudimentary markets. Others included processed items such as stockings, clothing, linen, baskets, soap, thread, cheese, vinegar, shingles, charcoal, and candles.[8]

Livestock were few and generally fended for themselves. Nonetheless, horses, steers, milk cows, swine, sheep, and poultry were kept. Not only meat, but butter, fiber, cloth, and feathers were important livestock-derived products.

By 1892, Theophilus Cazenove traversed the Great Valley and noted thriving farms with "large fields of wheat, corn and buckwheat" as well as clover, tobacco, potatoes, flax, cabbages, and carrots. He continued: "the hollows are good pasture…the houses are stone, and several of log and stone." Farmers were selling beef, mutton, veal, wheat, salt, and butter; "they have all become rich, through the high price of grains since the French Revolution." Anne Royall summed up the livestock practices with this observation of the Lehigh Valley: "large sleek cattle, few sheep, and few horses in sight, but a number of fine hogs running at large in the woods."[9]

In sum, the early farm economy in the Great Valley mixed subsistence, cash grain production, bartering, and other forms of exchange to create a highly diversified, small-scale agricultural system.

Labor and Land Tenure, Mid-Eighteenth to Early Nineteenth Century

Farm production relied heavily on human energy in this period. Slow oxen were the main draft animals, and farm implements were few and crude. The wood plow, scythe, flail, hoe, and rake were important implements. So, people were the main requisite for farming. They came mainly from family; every man, woman, and child had his or her own allotted duties, and at peak times everyone joined in the same work. Additional labor was obtained through neighborly exchanges.[10]

Another important labor source came from various types of "bound" or "unfree" labor. For example, under the "redemptioner" system, young adults with few resources paid for their trans-Atlantic passage by working for a period of years. These people came from all over Europe, including the British Isles. Some criticized the redemptioner system as a form of "white slavery," while others saw it as a practical system that benefited both worker and employer.[11] Indentured servitude was another form of "bound" labor, usually involving a child or teenager bound to a family for a period of several years, laboring in return for some training and possibly schooling, as well as room, board, and clothing. In 1818, for example, Lehigh County widow Eva Hoatz indentured her daughter to Adam Michael. The agreement read:

> Heidelberg Township, Lehigh County, April 15, 1818. An agreement between Eva Hoatz, widow, and Adam Michael, as follows: first, Eva Hoatz hires her daughter, Magdalena Hoatz, to Adam Michael for four years, and Adam Michael shall give Magdalena Hoatz: a new cotton tick with sixteen pounds of feathers; a plaid cover for the whole bed, a new homemade cover; a linen bedsheet and one of new home-spun, two new pillows, one large and two small; a new tow-colored bedspread; a new low bedstead for a new and complete bed; a new chest with five drawers; a cow or nine pounds of money in lieu of the cow; a new spinning wheel, a new iron kettle of medium size, also a pan; furthermore during the entire term of employment he must keep Magdalena Hoatz supplied with clothes for Sunday and work-a-day wear, and must send her to school for three months and to catechetical instruction and confirmation. He must present her with a new dress of her own choosing, except that it shall not be a silk dress; and Magdalena's

> employment begins January 1818. Signed on the day and date above given. Witnessed by: Adam Michael, John Peter, Georg Hoatz[12]

A very few slaves also appear on farms in the documentary record for the period.[13] The central point here is that most farm laborers were "unfree" in the sense that they were subject to binding, usually multiyear, agreements. Patriarchal power was so strong that even family labor was 'bound' to some extent, since men exerted considerable legal control over wives and children.

Tenancy was an important institution. Sometimes it functioned as yet another means of obtaining and controlling scarce farm labor, but also it allowed people to ascend the "agricultural ladder," accumulating resources while renting in order later to purchase land. Rates of tenancy are not available for this period in the Great Valley, but it is safe to say that it figured prominently in the agricultural system. Documentary evidence is readily available; for example, in Cumberland County, an 1805 sharecropping contract between Nicholas Schwerdt (the tenant) and William Alexander specifically explained how crops would be divided and expenses distributed.[14]

Another important point to consider about labor in this time and place is that many people combined farming with other occupations, often trades like cabinetmaking, shoemaking, or carpentry, or even with professions such as the ministry.[15]

Buildings and Landscapes, Mid-Eighteenth to Early Nineteenth Century

Houses, Mid-Eighteenth to Early Nineteenth Century

Architectural survivals from before 1800 represent only the upper end of Pennsylvania housing. Overwhelmingly, the typical eighteenth-century dwelling was a small log structure, often only a single story. In Cumberland County, for example, the average house c. 1770 measured about 21 by 26 feet and had two rooms and a loft.[16] The 1798 Direct Tax offers detailed evidence that the building stock consisted of log dwellings with around 600 or 700 square feet of living space.[17] These buildings offered little room for agricultural processing work or storage.

The larger early houses in this region are among the most famous in Pennsylvania, so they have been much discussed by architectural historians. The reader is referred to the excellent works on colonial Pennsylvania architecture for detailed discussions about these buildings. For the purposes of this narrative, an attempt will be made to offer a broad and brief synthesis of major house types and their relationship to agriculture.[18]

The cultural mixing in colonial Pennsylvania is represented in the many architectural traditions that were combined and recombined. The famous "Continental" house, for example, was favored by German speakers. It featured a roughly square foot print, a front elevation with asymmetrically placed openings, a roof-ridge chimney, and a floor plan dominated by a long narrow kitchen with central hearth, a 'stove room" heated off the hearth, and a "kammer" or chamber. Variations on the type were built in stone, log, half-timbering, and frame. Often these houses would have a full cellar through which ran a stream or spring. Some of these were vaulted. The one-or two-level attic often contained room for grain storage and a smoke chamber for smoking meats. The agricultural significance of these houses is in their extensive productive spaces. Cellar areas were important work and storage sites, while storage and processing occurred throughout the house. Over time, continual interactions among cultural groups resulted in modifications to the "Continental" house type.

In Cumberland County, evidence appears in the built environment that Scots-Irish people were adapting into log their traditional stone one-story, one- or two-room dwelling. Some had a hall-and-parlor configuration.

Immel house, Jackson Township, Lebanon County, 1759. Site 075-JA-004.

Over time, the average dwelling became more substantial and less "ethnically" distinct. All cultural groups embraced Renaissance

ideals from Europe, which architecturally translated into features such as exterior symmetry (regularly spaced windows in a three-, four-, or five-bay front elevation), rooms with specific functions, and passages or hallways which separated interior spaces. The central chimney was replaced by gable-end chimneys. Often the change was only superficial; exterior symmetry might mask more traditional interiors. Productive spaces continued to be integrated into dwellings, especially the large kitchen and vaulted cellar and sometimes attic storage and processing too. Sometimes the kitchen appeared as a substantial ell.[19]

Springood Cabin, Allentown, Lehigh County, late eighteenth century. From Ann Bartholomew, *Allentown, 1762-1987*, page 20.

House, Jackson Township, Lebanon County, c. 1789. Site 075-JA-003.

House, Jackson Township, Lebanon County, 1838. Site 075-JA-005.

Barns, Mid-Eighteenth to Early Nineteenth Century

Abraham Bertolet ancillary house, Oley Township, Berks County, c. 1740. This building had a first story kitchen.

Because livestock were few and crops small, barns were either absent or quite modest in scale, especially before 1800. Often the Direct Tax lists a log "stable" rather than a proper barn. These early buildings were small and built all on one level. For this reason they are sometimes called "ground barns." These tripartite structures had a main entrance in the long side, leading to a threshing floor. In turn the floor was flanked by a hay mow and stable areas. This space accommodated the modest needs for hay storage, grain processing area, and housing a few select animals. Very few of these survive intact. Some years ago Robert Ensminger documented one in Berks County but it is now badly deteriorated.[20] The Casper Maul barn in the Oley Valley, 1791, is a late example in stone. In Cumberland County, the Alexander Leckey barn is a late-eighteenth century survival. It has double log cribs and is not banked, though at 25 feet by 60 feet it is large.[21]

Casper Maul barn, Oley Township, Berks County, 1796.

Outbuildings, Mid-Eighteenth to Early Nineteenth Century

Outbuildings were relatively scarce during this early period. Most commonly found in the documentary record are kitchens, spring houses (also called "milk houses"), still houses, bake houses, and smoke houses. Philip Pendleton has identified an "ancillary

house" type which often encompassed more than one of these functions, or served as a second house for grandparents or tenants.

Keim Homestead ancillary building, Oley Township, Berks County, c. 1760. This banked structure had a spring in the basement and accommodated a wood-turner shop on the upper level.

Bakehouse, Bertolet-Herbein homestead, Berks County, reconstructed, date uncertain. The bake oven was situated in the rear, but a "squirrel" tail ran the smoke back into a chimney on the roof ridge. A sheltered area protected workers and products.

Dairy or wash house, Schaefferstown, PA, late eighteenth or early nineteenth century. The interior is lined with shelves.

Spring house, Cumberland County, late eighteenth or early nineteenth century. This combination building has a spring in the basement and a fireplace on the upper level.

Smokehouse, Tulpehocken Manor, Jackson Township, Lebanon County, late eighteenth century. This large structure held large amounts of meat and was secured with a hand wrought iron bar.

There is evidence to suggest that still houses were as common as other farm outbuildings of the era.[22] The distilling process required both water and heat, so a still house would probably have a water source and a fireplace. No free-standing still houses were documented in the Pennsylvania Agricultural History Project field study. However, architectural historian Nancy Van Dolsen in earlier work documented two still houses in Cumberland County, both dating c. 1800-1825. They were banked, built of stone and were rectangular with a large length:width ratio, measuring about 12 by 20-24 feet. A stream ran through a channel in the lower level floor and there were stone troughs there also. On the upper level were "...a gable end door, slit openings for light, and a fireplace."[23] Spring houses could be, and were, used for distilling. In particular, it would seem that springhouses with an upper level fireplace would be well suited to distilling.[24] The Alexander Schaeffer

Alexander Schaeffer House, Lebanon County, mid-eighteenth century. Historians are fairly sure there was a still in the lower level.

farm house in Lebanon County has architectural and documentary evidence that distilling took place in its basement.

The farm landscape in this period would have been a patchwork of small crop fields, woodlots, orchards, and meadows. Philip Pendleton points out that it "would have taken on a rather ramshackle appearance to modern eyes," since no lawns set off the house and fencing was rudimentary. Stump fields lent an unfinished air to the landscape.[25] Except for boundaries that might mark longstanding property lines, these features do not survive.

Early Nineteenth Century to c. 1900: Diversified Grain-and-Livestock Farming

A major agricultural transition took place around the turn of the nineteenth century throughout eastern and central Pennsylvania. It began with crisis. The infamous Hessian fly invaded southeastern Pennsylvania in the 1790s and caused widespread devastation, prompting farmers to reconsider their overreliance on wheat. In any case, some observers believed that soil exhaustion was beginning to set in. In 1807, Thomas Jefferson's Embargo delivered another blow to grain producers, making foreign markets less accessible. European recovery after the Napoleonic Wars, then the Panic of 1819 and ensuing depression also forced readjustments. Competition from newly opened wheat lands in the Genesee River Valley of New York State and in the nascent Midwest brought low-priced grain into competition with Pennsylvania wheat.

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. In the Great Valley, inland towns like Easton, Allentown, Reading, Lebanon, Harrisburg, Carlisle, and Chambersburg grew rapidly, providing domestic markets to replace lost overseas outlets. The nonagricultural population grew in rural areas, too, as the economy diversified and agriculture mechanized. At the same time, transportation infrastructure knitted the region together. Improved macadam road, plank roads, and turnpikes made road travel easier. The Lehigh Canal was completed in 1829 and the Union Canal in 1830. The latter penetrated right into the Great Valley and connected it with Philadelphia. Barely as soon as the canals opened, rail links followed.

Already by the mid-1840s the Cumberland Valley Railroad passed through the county's center, and by the late 1850s rail lines traversed the entire length of the Great Valley. Philadelphia, Lancaster, Baltimore, New York City, and Pittsburgh were now more easily accessible.[26]

These domestic markets could be supplied with products that (unlike wheat) were consumed fresh. This meant that not only fruits and vegetables, but livestock and livestock products (meat, butter, cheese, eggs, and so on) took on new possibilities for eastern farming families. The basic agricultural adjustment made in this changing atmosphere was to shift from a crop-centered system to a crop-and-livestock system which incorporated rotations, manuring, and liming and which produced a diverse array of both crops and livestock products. Crop rotation avoided unproductive fallows as a way to replenish the soil, instead substituting a sequence of crops, usually corn, wheat, oats, and grass. The grasses (for hay and pasture) contained timothy and clover, which improved soil texture and returned organic matter to the soil; this process was often enhanced by liming. Fertilizing with barnyard manure was a second key aspect in rotations. Manure had to come from confined livestock, and so the field husbandry and animal husbandry worked in tandem. At the same time, earlier constraints on available labor power began to drop away. Industrialization brought farm mechanization, both increasing the (rural and urban) consuming population and making the new style of farming feasible.

A Lehigh County correspondent for the *Farmer and Gardener* in 1834 summarized the changes:

> ... the introduction of the use of lime in farming, and the culture of clover about 20 years ago, wrought a most salutary revolution, and saved the second and third rate lands from being deserted for the far west. Every summer adds to the number of solid and capacious barns, and old ones enlarged.... Common rotation, 1st. clover, 2d. Indian corn, 3d, oats or flax, and potatoes, manure, 4th, wheat, 5th and 6th, clover...

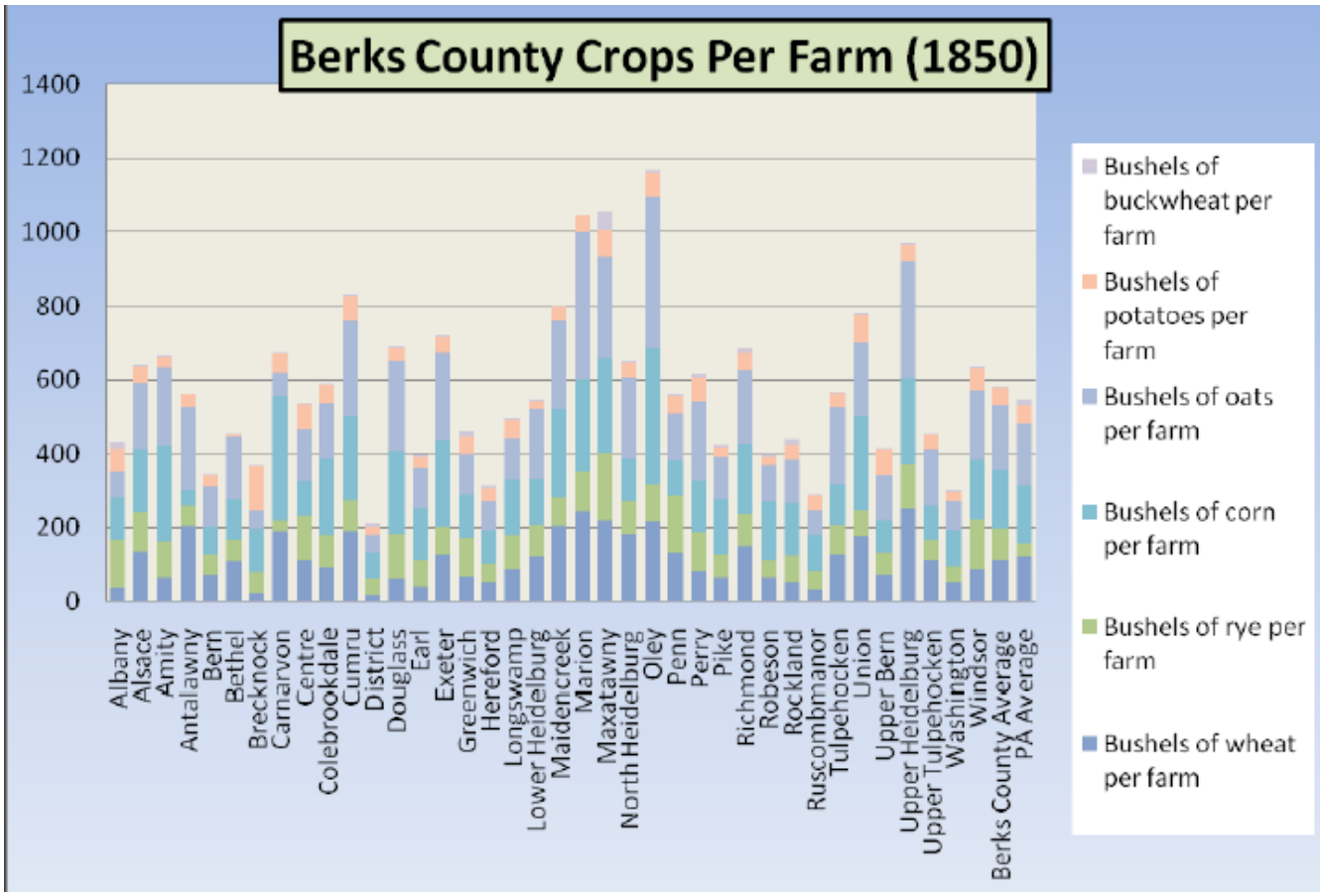
This correspondent also noted that liming had "quick and immediate" effect on rye culture, which as we have seen was quite important there.[27]

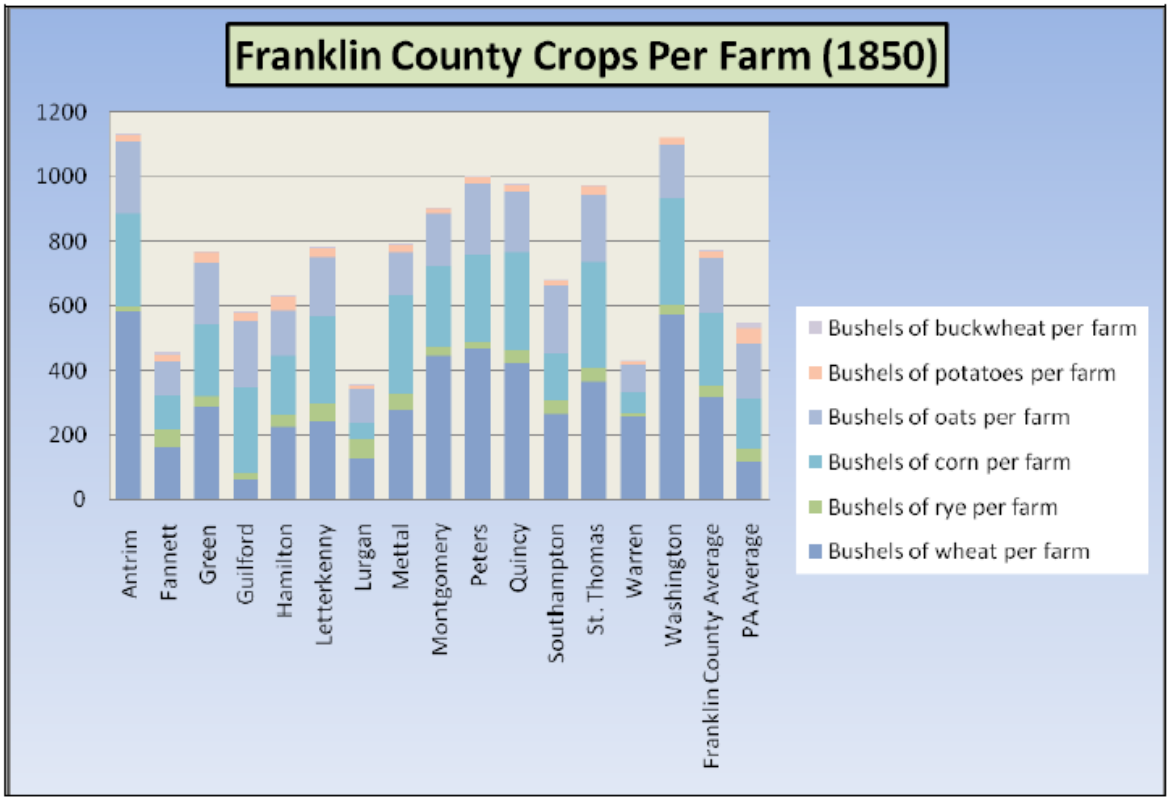
An important social trend in the Great Valley during the nineteenth century was its increasingly Pennsylvania German flavor. Not just rural areas, but cities like Reading now became predominantly Pennsylvania German. By 1880, in Cumberland and Franklin Counties the percentage of Pennsylvania Germans had risen; most Cumberland County townships were now at least 45% German. During these years the people in the rural hinterland developed their rich Pennsylvania German cultural life. Without indulging in hoary stereotypes about the Pennsylvania Germans, it is possible to argue that this period represented a flowering of Pennsylvania German rural culture. In the years of the early Republic "Germans in Pennsylvania" coalesced to become "Pennsylvania Germans." Since colonial days, German speakers in Pennsylvania had evolved a common dialect and established church communities and schools. Immigration from German-speaking lands had trickled to a stop by the early nineteenth century. Settled Pennsylvania German communities developed a sense of common identity through struggles over such issues as state-sponsored schools and religious evangelicalism, and through conflict with the newly arrived "forty-eighter" Germans. Pennsylvania German cultural practices and forms peaked during these years. In few places was this more evident than in the rural Great Valley.

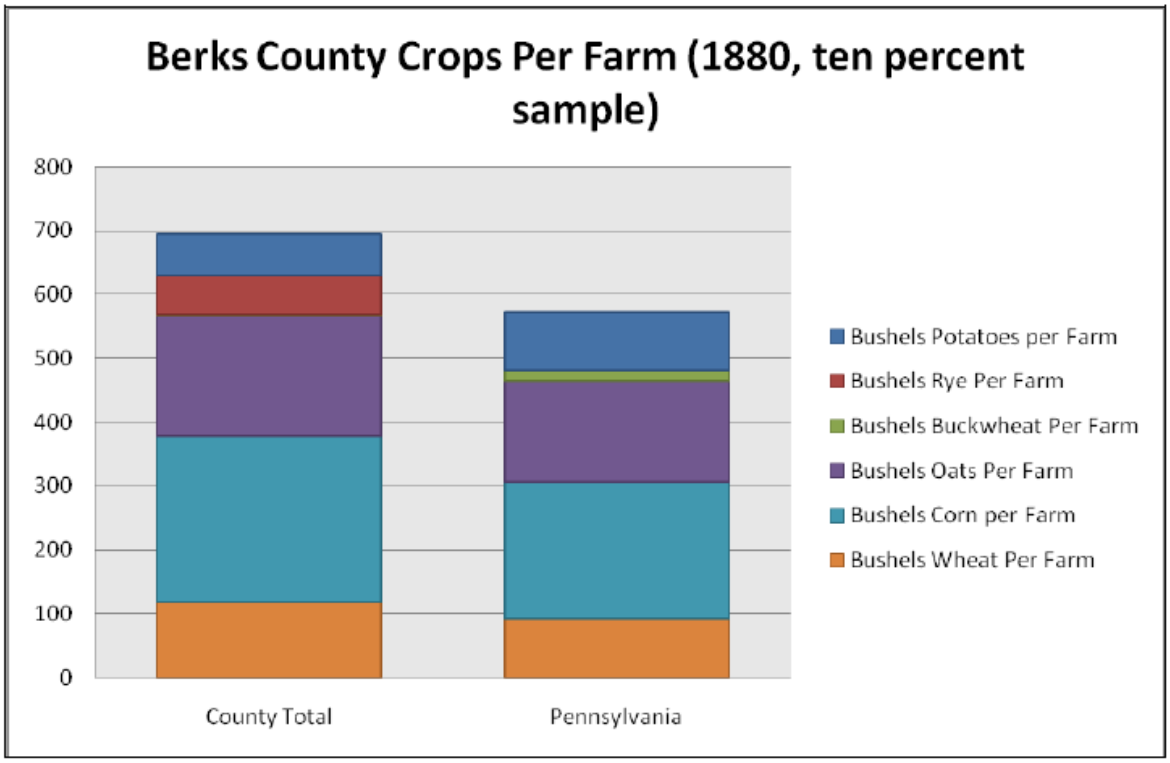
Products, Early Nineteenth Century to c. 1900

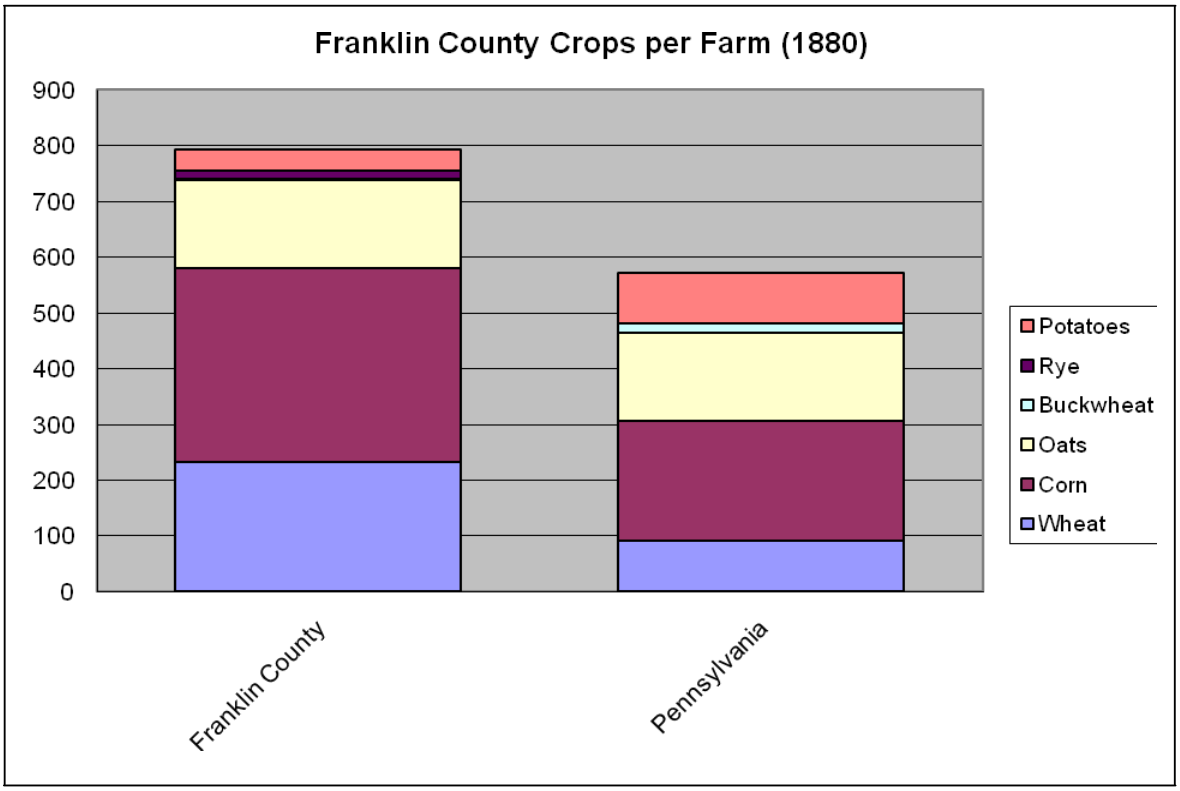
Nineteenth-century farm families in the Great Valley developed a richly varied agricultural economy. In general, crop production still exceeded state averages, while the number of livestock was lower than average. The one factor accounting for the difference in livestock numbers, however, is that almost no sheep were raised in the Great Valley. Great Valley farms actually had more cattle, horses, and swine than the average Pennsylvania farm. These formed the basis of intensive crop-and-livestock systems, while sheep were raised on pasture. The crops and livestock produced on Great Valley farms often went to local or regional markets, but almost everything had interchangeable uses, from livestock feed to family food to neighborly exchange. The Valley's pronounced Pennsylvania German character subtly shaped production patterns.

Agricultural statistics are available for 1838 in some cases, and together with the 1850 figures, they reveal that the new system was settled and flourishing. The typical farm was smaller than average for the counties east of the Susquehanna; about average in Lebanon and Dauphin Counties, and larger than average west of the river. This probably reflects the timing of settlement rather than any fundamental differences. Throughout the Great Valley, farms had significantly more improved acreage, on average, than the typical Pennsylvania farm. Great Valley farms produced large crops of wheat, corn, and oats. Corn acreage and production rose rapidly to take a central place in the crop rotation.[28] Most corn stayed on the farm; it was either fed to livestock or consumed by humans. At mid-century rye was still grown in Lehigh, Berks, and Northampton Counties, but by the end of the century rye had become less important even there. Barley, buckwheat, potatoes, turnips, hops, and hemp took up small acreages but provided important feed and fiber. Hay production was above average throughout the Valley, at 15-18 tons per farm. This reflected the prevalence of rotations and the need for livestock feed. Hay was also sold and sent out via rail.[29] The 1838 census for Cumberland County split the accounting for hay lands into acreage for clover (21,900); timothy (4,160), and "natural meadow," only 2,170 acres. This shows impressively the extent to which hay land had been developed and brought into a rotation system.


Berks County Crops Per Farm (1850)
1400
1200
1000
800
600
400
200
0
Albany
Alsace
Amity
Antalawny
Bern
Bethel
Brecknock
Carnarvon
Centre
Colebrookdale
Cumru
District
Douglass
Earl
Exeter
Greenwich
Hereford
Longswamp
Lower Heidelburg
Maidencreek
Marion
Maxatawny
North Heidelburg
Oley
Penn
Perry
Pike
Richmond
Robeson
Rockland
Ruscombmanor
Tulpehocken
Union
Upper Bern
Upper Heidelburg
Upper Tulpehocken
Washington
Windsor
Berks County Average
PA Average
Bushels of buckwheat per farm
Bushels of potatoes per farm
Bushels of oats per farm
Bushels of corn per farm
Bushels of rye per farm
Bushels of wheat per farm


Franklin County Crops Per Farm (1850)
1200
1000
800
600
400
200
0
Antrim
Fannett
Green
Guilford
Hamilton
Letterkenny
Lurgan
Mettal
Montgomery
Peters
Quincy
Southampton
St. Thomas
Warren
Washington
Franklin County Average
PA Average
Bushels of buckwheat per farm
Bushels of potatoes per farm
Bushels of oats per farm
Bushels of corn per farm
Bushels of rye per farm
Bushels of wheat per farm

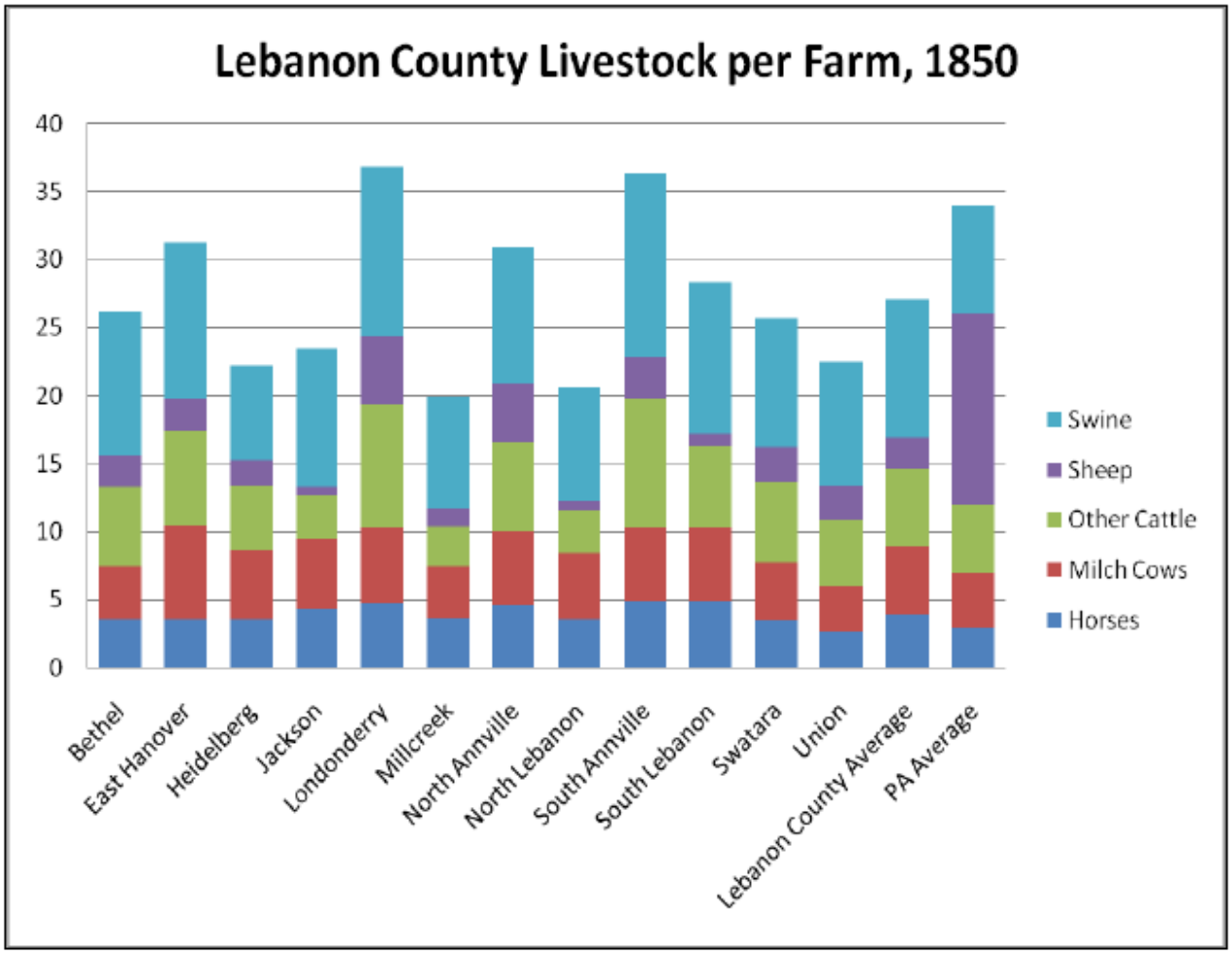

Berks County Crops Per Farm (1880, ten percent sample)
800
700
600
500
400
300
200
100
0
County Total
Pennsylvania
Bushels Potatoes per Farm
Bushels Rye Per Farm
Bushels Buckwheat Per Farm
Bushels Oats Per Farm
Bushels Corn per Farm
Bushels Wheat Per Farm

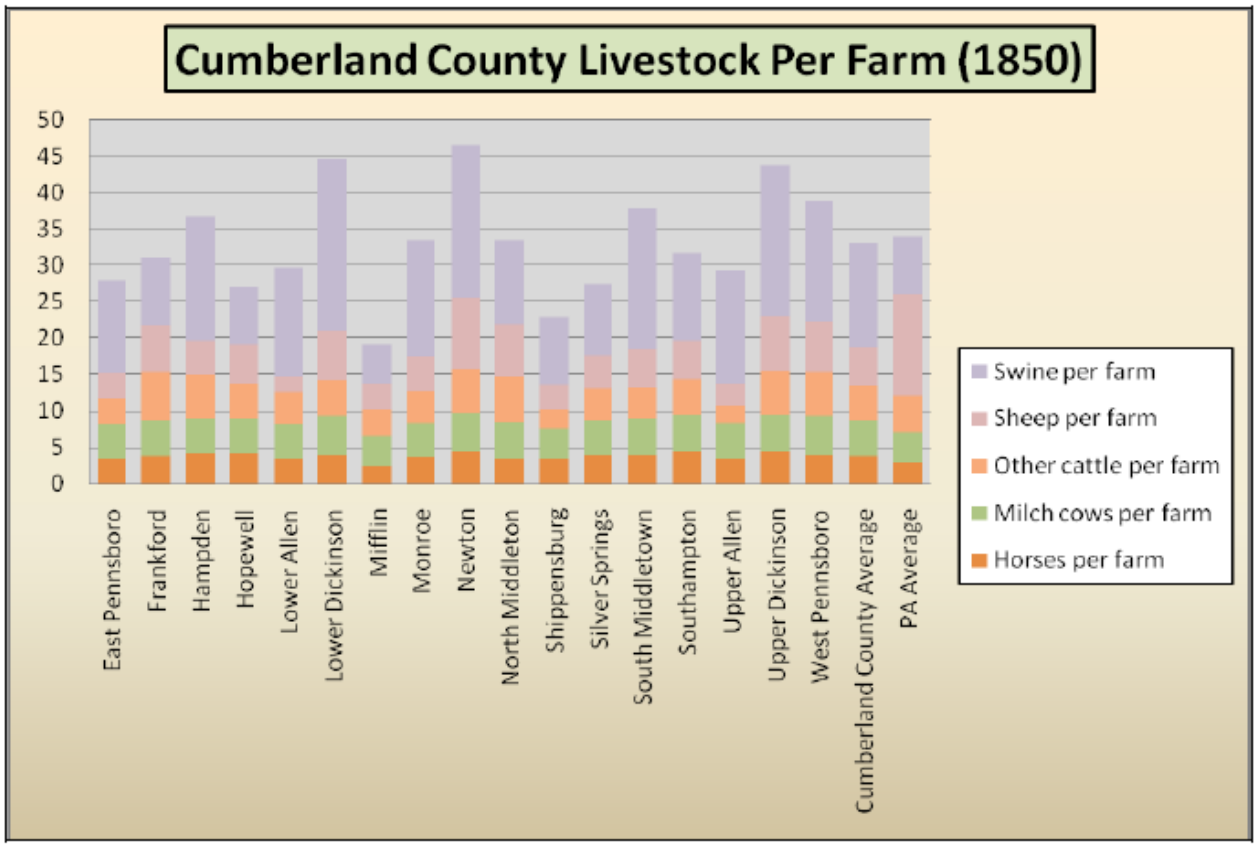


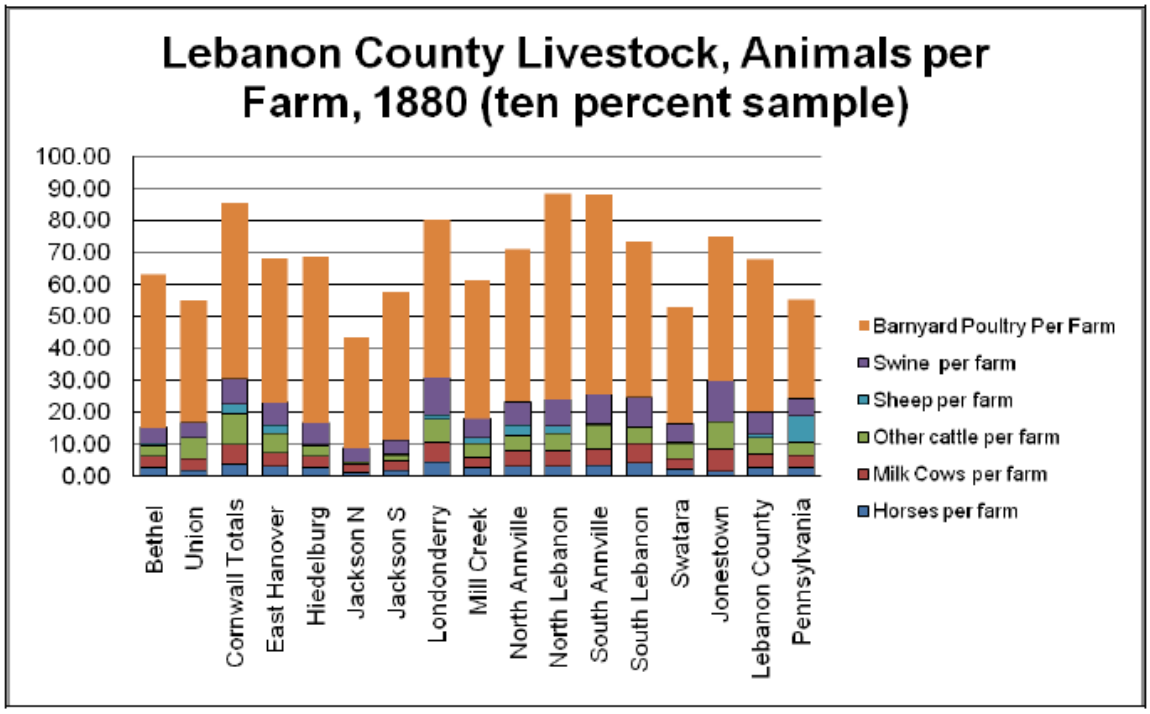
The aggregate figures show regional patterns clearly.

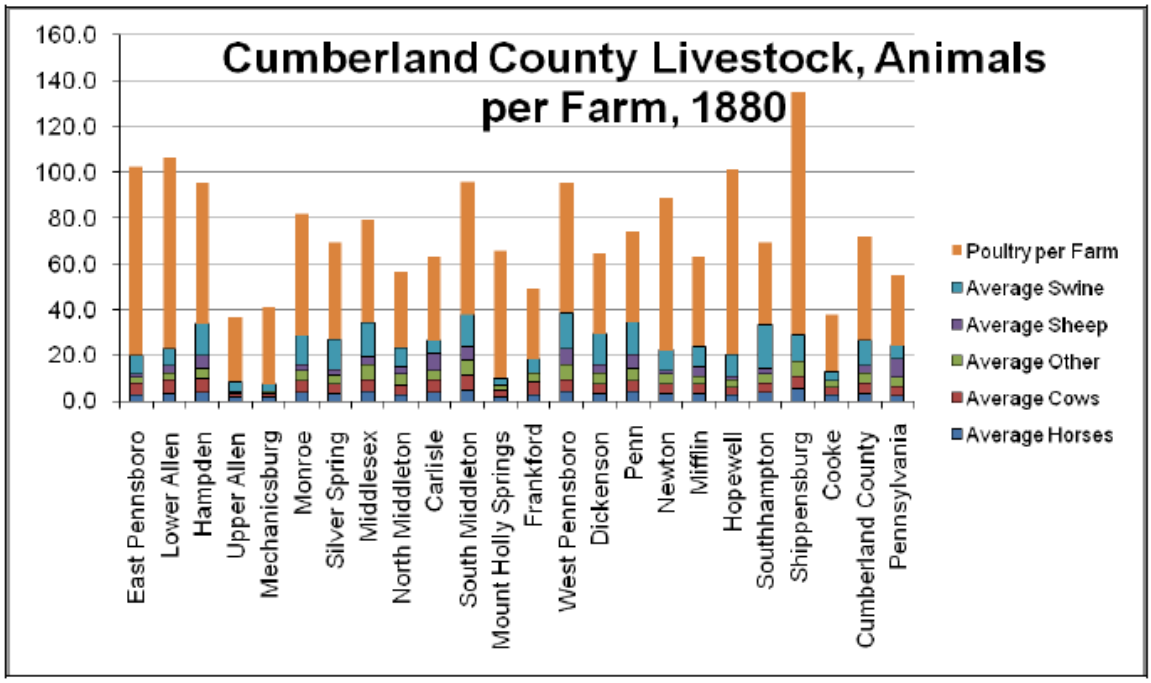
Throughout the nineteenth century, Great Valley farm families kept two or three horses; about four milk cows and a few steers; half a dozen sheep; and more than a dozen swine. In 1854 Eli Bowen, author of the *Pictorial Sketch-Book of Pennsylvania,* noted that livestock production was shaped by access to railroad lines. Nearer the railroad, the farmers "turn their produce… into the dairy, or dispose of their grain by the ushel," while further away they "are compelled to feed cattle during the winter…" purchasing from western drovers and sending on fattened cattle to market in the spring.[30] Swine were far more important in the Great Valley, and sheep far less important, than in the state as a whole. The typical farm in the Great Valley had ten pigs, and often more. Pork was central to Pennsylvania German diet and foodways; food historian William Woys Weaver estimates that pork consumption was twice that of beef consumption.[31] Farm families slaughtered two or three hogs, and sold the rest. Sometimes pig raising occurred in a mutually profitable relationship with the distilling industry. In Lehigh and Northampton Counties, for example, local farmers took their live hogs to a commercial distillery in Catasauqua, where the hogs were fed on distillery waste. When fattened, the pigs were taken back to the farm for slaughter. The distillery also purchased farmers' corn.[32] Dairy

production was about average; Great Valley farms produced a small surplus of butter. Some townships produced more because they were near good markets, especially as the century went on.




Cumberland County Livestock Per Farm (1850)
50
45
40
35
30
25
20
15
10
5
0
East Pennsboro
Frankford
Hampden
Hopewell
Lower Allen
Lower Dickinson
Mifflin
Monroe
Newton
North Middleton
Shippensburg
Silver Springs
South Middletown
Southampton
Upper Allen
Upper Dickinson
West Pennsboro
Cumberland County Average
PA Average
Swine per farm
Sheep per farm
Other cattle per farm
Milch cows per farm
Horses per farm





The array of farm products was remarkable. Beeswax, cord wood, soap, and candles were enumerated in the 1838 tally.[33] Many farms had limekilns, and burned lime in the off season to sell and to spread[34] Clover seed was a valuable commodity.[35] Orchards by now were mature and productive, supplying apples, peaches, pears, and cherries.

Small fruits like raspberries and strawberries were also grown. The family vegetable garden yielded a year's supply of cabbage, beans, squashes, parsnips, carrots, tomatoes, and many other items. Poultry for meat, eggs, and feathers were found on every farm; an 1848 Dauphin County report estimated there were "25 to a family."[36]

What was "Pennsylvania German" about these agricultural production patterns and processes? How do we separate the impact of ethnically neutral factors like markets and soils?

James Lemon argued that in colonial Pennsylvania, the Germans' agricultural practices were no different from others'. He persuasively showed that everyone grew the same crops, including unfamiliar New World plants like corn and squash. He also found that everyone practiced the same "extensive" kind of farming, and shared a tendency to settle on scattered individual farmsteads – both decidedly against European tradition. More recently, scholars such as Gabrielle Lanier and Cynthia Falk have challenged other stereotypes. The evidence for the nineteenth century suggests that Pennsylvania German agriculture was very much geared to raising what local soils and climate could yield, for the best market prices. Pennsylvania Germans' highly diversified portfolio of crops and livestock did not differ in content from that of Pennsylvania's "Yankee" areas. Few "ethnic" qualities attached to such universal practices as selling hay or grain, milking cows, or planting an orchard. Even the Pennsylvania Germans' consumption patterns shared a great many features in common with dominant American practices. Yet at the same time, local cultural preference surely shaped some production choices. The preeminence of hogs in livestock raising is an example. One might expect to find swine in the "Yankee" Northern Tier, where they could be fed dairy by products. But "Yankees" preferred beef to pork and they did not raise a lot of pigs. Another case in point is the persistence of rye.

Ethnic practices asserted themselves most noticeably after harvest or slaughter. Many raw products were further processed on the farm. Hogs were converted to fresh pork and smoked ham, bacon, and sausage. *Panhaas*, or scrapple, was a Pennsylvania German favorite made from trimmings, spices, and corn meal. Blood pudding was made at slaughtering time. Milk was made into butter, but also into *smier käse* (a soft cheese),

and cottage cheese. Apples were converted to *snitz* (dried, sliced apples), apple butter, cider, and applejack. Cabbage became sauerkraut. Cucumbers and other vegetables were pickled. Corn was dried. In short, a great many farm productions in the Great Valley helped support Pennsylvania German foodways. These practices were blends of European and American foods and customs. Folklorist Don Yoder has noted that Pennsylvania German cuisine is "an American hybrid..." The "Germanic cuisine that was brought with the emigrants in the seventeenth and eighteenth centuries has been subtly changed, through simplification and acculturation."[37]

It would be a mistake to consider the results as purely geared toward family subsistence. A memoir about the Harrisburg Broad Street Market in the 1840s and 1850s (sometimes dubbed the "Dutch market") shows a flourishing market in these same products:

> … the memories (of the old market houses) remain. We all remember the substantial unpretentious buildings, well ventilated and airy, through which the blasts of winter swept without hindrance, and where the snows piled up in pretty hillocks… When we recall the tons and tons of all manner of produce and luxuries to tickle the palates of hungry men, women, and children, and the barrels and barrels of 'Smear Kase' and apple butter that were distributed… and the ark loads of juicy beef and mutton and pork, and the miles of sausages and puddings, and the ten thousand bushels of apples and peaches and pears and plums, and the pyramids of golden butter and millions of fresh laid eggs that were carried away from the old market, we stand aghast…[38]

A 1943 history of the Harrisburg market noted that in the nineteenth century one could buy "All the things you can buy today and some products that have gone out of existence since our forefather's [sic] day. There were sausages of all kinds, both fresh and smoked; "smier kase" and "cottage cheese" mixed with cream or milk. Cream, sweet milk, buttermilk, dried fruit or "snits," a kind of ginger bread called "Lep kucher," teas of many varieties, fruits, vegetables of many kinds, poultry, live and dressed. Before Memorial Day there was always a large supply of many varieties of flowers that are today practically unknown."[39]

Labor and Land Tenure, Early Nineteenth Century to c. 1900

Family still constituted by far the most important source of farm labor. Gender and age shaped the division of labor, but not rigidly. Men usually did jobs like feeding steers, plowing, mowing, planting, cutting cordwood, and cradling grain, while besides the cooking and baking, women raised poultry, prepared produce for the town market, milked the cows, made butter and cheese, and tended the garden. However, as before, all adults worked together frequently. Corn husking, haying, grain harvesting, butchering, potato and apple harvesting, and apple butter making are just some of the tasks in which all adults shared.[40] Photographer Winslow Fegley recorded men, women, and children going about their work in Berks County.

Where non-family labor was concerned, farm labor practices had changed in important ways. The transition to free wage labor was essentially complete by about 1830. Some farm households engaged wage workers on a long-term basis, paying by the month or even contracting for an entire year. In other cases, hired men and women worked intermittently, for instance during harvest time or when a new child was born. Regardless of whether they worked by the day or year, wage laborers had become integral to farming. By 1838, for example, in Berks County there were reportedly over 6,000 farmhands (or more than three for each farm) "steadily employed" at $9 per month.[41] Probably most of these workers were from the local neighborhood. The cash nexus subtly changed the employer:worker relationship, since fewer obligations or constraints bound the two together. Historians note a reforming trend urging farmers to adopt ideals of efficiency, time-consciousness, and sobriety. These shifts were gradual.

Farm mechanization dramatically changed both labor processes and labor needs during this period; more work was done using animal and machine power, and less human power was required. This is a familiar story and it played out in a thoroughgoing way throughout the Great Valley, since its farms were more highly mechanized than typical Pennsylvania farms. Sale announcements, probate inventories, and account books help to measure the shift. An ad in the March 7, 1860, *Northampton Journal* was typical. Among the items to be auctioned were:

> Four horses (of which one is a good breeding mare with foal, and one a stud), seventeen head of cattle, of which seven are good milch cows, six heifers, one large Devonshire bull with three young bulls of the same stock, nine head of hogs, one breeding sow with pigs, one four horse wagon and body, one two horse wagon and body, one truck wagon, one spring wagon, one sulky, one first rate pair of bob sleighs, two good wood sleds, one plank sleigh, one sett of quiller harness, one sett of Yankee harness, one sett leader harness, and plough harness. Five ploughs, two barrows, one Fanning Mill, one cutting box, one chop chest, hay ladders, mixing trough, log and other chains, manure forks and rakes, one cradle and scythe. Also a small assortment of Household Articles consisting of two cooking stoves, one parlor stove, one bedstead and bedding, one corner cupboard, cider mill trough, one table, and about forty Bushels planting potatoes.

Note that this collection of tools lists old style hand tools like manure forks with a more modern grain cradle and fanning mill.

By 1886, Judge Heister of Dauphin County could look back and recount the cumulative effect of mechanizing many different processes:

> ...In early years I made a regular pilgrimage to Powell's and Lyken's Valleys during the month of May to engage eight or ten skilled workmen with scythe and cradle to help with haying and harvest. In those days the ministers of the gospel for the sake of health and social enjoyment, came to the country and made a hand in the field; now they go to the sea shore. ... Now we send one man with a pair of horses and mower to the field, and he will do the work of ten men in a day. The next day a man with a tedder and one horse, and he will do the work of ten men in turning the grass. Again we send a man and one horse with a rake and he will do the work of ten men in gathering into winrows, and when the hay is ready for the barn, with the hay fork and horse power we unload a ton and a half of hay in twenty minutes. So with threshing, instead of spending half the winter in tramping out the grain with horses, we engage a steamer and in a few days, by threshing 400 bushels of wheat or 600 of oats a day, the work is done.[42]

Land tenure practices in the Great Valley shaped the region's social and architectural landscapes. Estate records, court records, and the like show that tenancy was pervasive in Pennsylvania throughout the nineteenth century. The 1880 Federal agricultural census offered the first systematically collected tenancy data. In that year, tenancy rates statewide averaged about 20 percent, but in the Great Valley, they were significantly higher, ranging from 28 percent in Berks County to 37 percent in Cumberland County. By 1900, fully half the farms in Cumberland County were operated by tenants or managers, and in the other Great Valley counties typically over 40 percent were tenanted.[43]

The iron furnaces in the region owned vast tracts and often maintained tenant farms. The Colemans in Lebanon County, for example, reportedly owned 22,000 acres. Little is known about these tenancy arrangements.[44] Most farm tenants in the region were share tenants working for a relative – that is, for compensation they received an agreed-upon share of the farm crops. The tenants usually paid taxes, and often supplied their own livestock and some tools. A Cumberland County rental agreement was described in the 1883 report of the county agricultural society: "the farm is worked by a tenant on shares. He has the use of the buildings, orchard, and garden, free of rent. He has all the benefits of grass, hay, fodder, and straw, *conditioned* on its all being consumed on the farm and converted into manure. He gets, for his share, one half the wheat, corn and oats raised on the farm. He furnishes all the machinery and motive power. He performs, or pays for, all the labor done on the farm; he builds and repairs the fences, and does the hauling necessary thereto (I paying for the material;) he pays the school tax and road tax; he furnishes one half the seed wheat, seed oats, seed corn, and grass seed sown."[45] Some tenants stayed over a long period, but usually the term was one year. "Flitting" day, March 1 or April 1, found streams of farm families on the road with their belongings. Winslow Fegley captured "flitting day" with vivid photographs in Berks County toward the end of the century.[46]

Share tenancy in the Great Valley had a familial and ethnic dimension. The institution had a strong kinship basis. In other words, landlord and tenant were often related, most frequently as father and son, but sometimes uncle and nephew, or father-in-law and son-in-law. In the 1820s a German immigrant schoolteacher named Jonas Gudehus noted that

the Pennsylvania Germans had a practice of "lending" their land to their sons and then retiring: the American German parent "often lease[s] his children the plantation ('loans out' one says there), moves into the city and leads a carefree life. However, he remains the owner of his possessions as long as he lives and when he dies then his children all get an equal share of the estate…" [47]

The ethnic aspect of kin-based share derived from common customs stretching back to German-speaking Europe in the early modern period. One was the *Altenteil,* or literally, "old peoples' part." This custom was a kind of old-age insurance in which a child received access to land in return for supporting the aged parent. Should the mother become a widow, the share rent made up her widow's dower.[48] Among the Pennsylvania Germans, kinship-based share tenancy filled a very similar function.

Buildings and Landscapes, Early Nineteenth Century to c. 1900

Houses, Early Nineteenth Century to c. 1900

During this prosperous time, modest log houses gave way to larger and more substantial dwellings of stone, brick, or frame. Extant houses from the period are numerous. The most common types are variations on the "Pennsylvania farmhouse" form – that is, a square-proportioned, double-pile, three, four- or five-bay house.[49] The "four-over-four" version of the Pennsylvania Farmhouse was especially popular. Often it had two central front doors. Most farm houses had at least two stories, and some had two and a half, or two full stories above ground plus a walk-in basement. Five-bay versions usually had a central doorway. These dwellings had interior gable end chimneys, sometimes just for stove flues rather than fireplaces. Exterior ornament was usually spare, and sometimes out of date.[50] The two-story ell with integral double-decker porch was popular, especially in the Cumberland Valley. The nineteenth-century Pennsylvania Farmhouse interior spaces and layout often represented subtle adaptations of the Pennsylvania German "stove room" and kitchen, and sometimes had no hallways; external openings were not reliable clues as to floor plan. Some productive spaces from the colonial era house, such as the attic granary and smoke house, had been moved to specialized outbuildings. The large farm kitchen still played an important productive role.

Scholars have noted a common architectural strategy of putting adapted "German" spaces behind updated "Georgian" facades. However, this blending could occur even on the farmhouse exterior. At least two examples from the mid-nineteenth century (in Franklin and Lebanon Counties respectively) have a formal, symmetrical eaves side oriented to the "public" side of the farm, and an asymmetrical gable end oriented to the "work" side, with doors entering directly into the kitchen. To be sure, these are not common, but they are notable instances where the builder chose to express both "traditional" and "formal" values on the building's exterior.

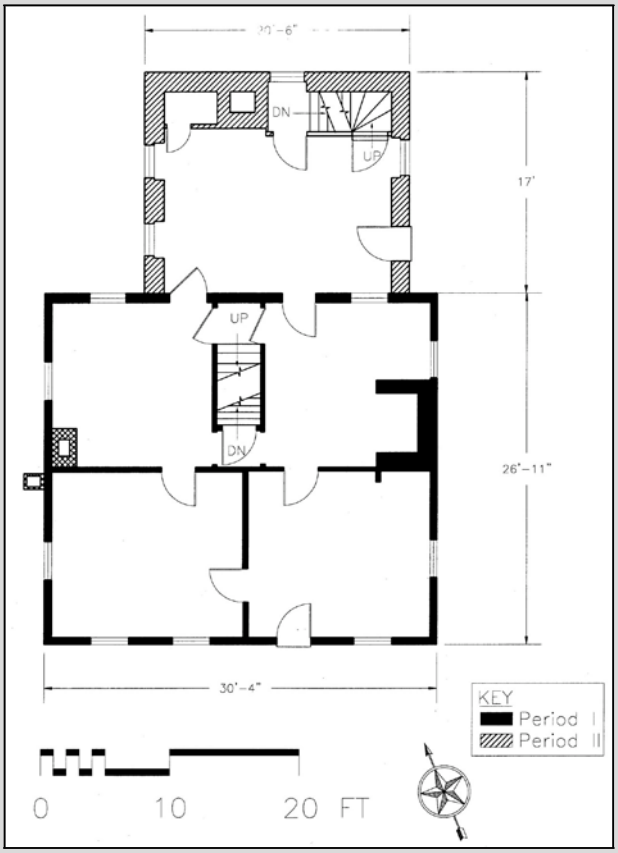
A stereotype about the Pennsylvania Germans invokes their conservatism. Numerous period observers voiced the opinion that the Germans were resistant to change. The historical evidence does suggest that there is some validity to this characterization; for example, German Reformed and Lutheran congregations resisted such innovations as Sunday School, and migration rates were low. However, cultural patterns were more complex than simple rejection of change. This can be seen in the landscape. A good example is in the custom of casing log buildings in brick. This was a popular strategy for updating farm buildings, especially in Cumberland and Franklin Counties. Architectural historian Nancy van Dolsen has shown how the practice allowed farm families to give their houses a new look, while expressing frugality and respect for the past in re-using an old building.[51] Moreover, it was not unknown for farming families to try out new forms such as the "foursquare," or to give their Pennsylvania Farmhouses contemporary trim.

Five-bay house with center door and walk-in lower level, South Annville Township, Lebanon County, 1855. The lower level has a spring house and kitchen, and is connected to the first floor by a dumbwaiter. Site 055-AN-005.

Three-bay house with side door, Antrim Township, Franklin County, 1825-45. Site 055-AN-011.

Four over four house with one door, Mill Creek Township, Lebanon County, 1843. Site 075-MC-008.

Four over four house with two doors, Bethel Township, Lebanon County, c. 1845-60. Site 075-BE-002.



Floor plan, four-over-four house, Oley Township, Berks County, c. 1870. This is the floor plan for the house shown in the next figure. Note the lack of hallways, kitchen hearth in one rear room, and "stove" room opposite.

Four over four house, Oley Township, Berks County, c. 1870. The corner quoins, window trim, 2/2 sash, and porch ornament give the form an updated look.

Four over four house with Victorian trim, Bethel Township, Lebanon County, c. 1875-90. Site 075-BE-001.

House with formal Georgian front and informal gable end entry. The porch and tree obscure it a little, but the gable-end entrance leads to a kitchen and the front is symmetrical and more formally trimmed. Mill Creek Township, Lebanon County, c. 1855. Site 075-MC-011.

House with formal Georgian front and informal gable end entry, South Annville Township, Lebanon County, built by Commodore Perry Steinmetz in 1852. South eaves side. This was the "public" front. Site 075-SA-006.

House with formal Georgian front and informal gable end entry, South Annville Township, Lebanon County, built by Commodore Perry Steinmetz in 1852. West gable end. This was the kitchen side and faced the working part of the farm. Site 075-SA-006.

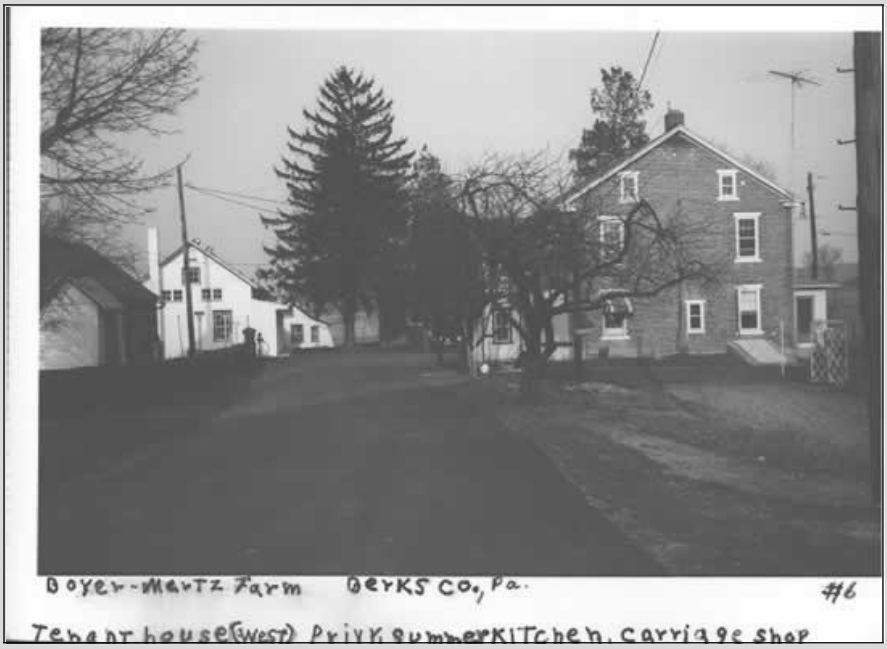
Foursquare house, Washington Township, Franklin County, c. 1865. Built by Jacob Miller. Site 055-WA-002.

Brick-cased log house, Washington Township, Franklin County. The main section was built around 1820 and cased with brick around 1850; the ell was added later in the nineteenth century. Site 055-WA-003.

Tenant houses were ubiquitous in the nineteenth-century Great Valley landscape. Sometimes a farm would have a main house (sometimes referred to as the "mansion" house), and a second house for tenants. In his 1844 history of Berks County, I. Daniel Rupp noted that "According to the report of 1838, there were two thousand and twenty-one farms, averaging seventy-five acres each. The whole number of stone farm houses, was one thousand two hundred and fifty four; brick houses, two hundred and seventy nine; wood farm houses, one thousand nine hundred and fifty five; tenant houses on farms (not farm houses) one thousand two hundred and five."[52] If Rupp was correct, somewhere around a third of farms had both a main house and a tenant house. Nancy van Dolsen has documented tenant houses in Cumberland County, and field study in Franklin County documented several farms with a main house and tenant house. Another type of tenant house formed the main house on a separate tenant farm. It is more difficult to identify these tenant houses definitely, because often they were quite substantial.[53] The National Register listed Knorr-Bare and Angstadt farms in Berks County each have substantial tenant houses.

Ancillary house, possibly a tenant house, Montgomery Township, Franklin County, early to mid-nineteenth century. Site 055-MO-004.

Log tenant house, Antrim Township, Franklin County, early to mid-nineteenth century. The house has a three-room floor plan. Site 055-AN-009.



Angstadt farm tenant house. PA CRGIS files.

Barns, Early Nineteenth Century to c. 1900

The famous Pennsylvania forebay bank barn had begun to appear in the late eighteenth century, but it was not the predominant type until well into the nineteenth century. Some of the most evocative examples of the type are found in the Great Valley. Its main diagnostic feature is 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. Traveler Joel Cook noted in 1882 that "red paint is evidently cheap in the Lebanon Valley, … for all the farm buildings and many of the houses are painted in cardinal."[54]

The Pennsylvania Barn was a highly flexible form. It ranged in size from just 20 feet long to over 100. 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 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."[55] The animals' confinement and the collection of manures really distinguished the new farming from the old; colonial farmers had kept livestock, but because they grazed freely, they were not really part of a highly integrated system. Pasture continued as an important seasonal feeding ground, but to it was added the barn as shelter and manure collection facility.

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.

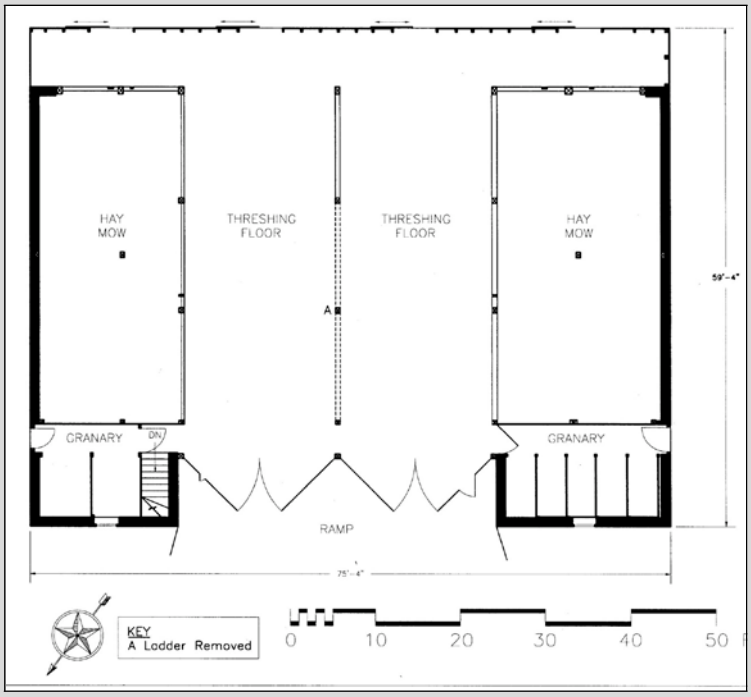
Practically every variant on the Pennsylvania Barn can be found in the Great Valley. A small barn in the Oley Valley shows how the form could be adapted to have just one threshing floor and mow. The Diller Barn in Cumberland County, by contrast, had five threshing floors, two mows, a seven-bin granary, and a cistern by the time it reached its final size. An 1863 ad in the *Franklin Repository,* listed a "cistern at the house, and one at the barn for watering stock."[56] One nineteenth-century site in Franklin County had a cistern apparatus integrated into the barn ramp area. The National Register-listed Boyer-Mertz (aka Angstadt) Farm in Maxatawney Township, Berks County has no fewer than five stone cisterns. Joel Cook held that "all the barns in this section [near Reading] have cisterns underneath, collecting the rain that falls on the roof, to secure a supply of water in time of drouth."[57] Barns might have rear outshed granaries; gable end machinery bays; or straw-shed ell additions. There was apparently a horse power room on the National Register-listed Ernest Angstadt farm in Maxatawney Township in Berks County. The barns were executed in brick, stone, log, and timber frame. Some were decorated with painted designs. The examples from the Great Valley, shown below, show the variety and underlying it a remarkable consistency in basic form.

Pennsylvania barn, Oley Township, Berks County, early nineteenth century.

Pennsylvania barn, near Moselem Springs, Berks County, date unknown, photographed 1941. The paint scheme on this barn included red, yellow, blue, and white. HABS, digital ID http://hdl.loc.gov/loc.pnp/hhh.pa1541.

Knabb barn, Oley Township, Berks County, 1829.

Jacob Plank barn, Cumberland County, 1853. This barn has rear granary outsheds.



Floor plan, Plank barn. CHAD.

Waggoner Barn, Cumberland County, 1858.

Frame Pennsylvania barn, Jackson Township, Lebanon County, 1895. The basic form continued to be built all the way through the century. Site 075-JA-009.

Boyer-Mertz farm (aka Angstadt), Maxatawney Township, Berks County. The shed-roof structure on the barn bank side housed a horse power. PA CRGIS files.

Springhouses, Early Nineteenth Century to c. 1900

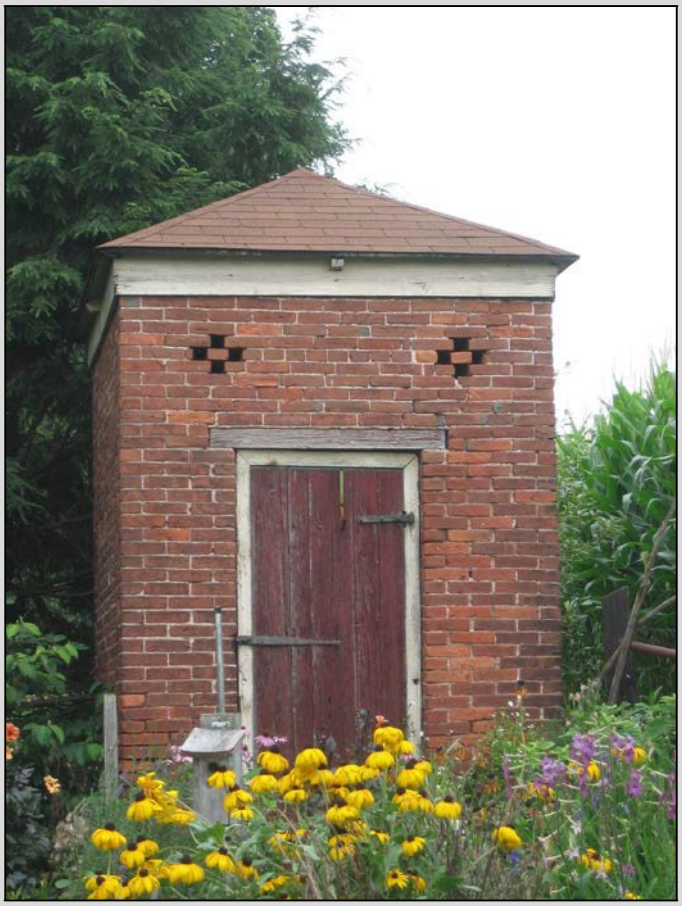
Springs often determined a farm site, and care was taken to protect the family's water source. As well, springhouses provided work space for cooling milk and separating it, then for butter making and storage. Springhouses often had two levels, sometimes appearing in combination with living quarters or a summer kitchen.

Springhouse, Heidelberg Township, Lebanon County, c. 1850. Site 075-HE-003.

Combination springhouse and summer kitchen, Jackson Township, Lebanon County, mid-nineteenth century. Site 075-JA-011.

Smokehouses, Early Nineteenth Century to c. 1900

The hog was central to Pennsylvania German foodways. Not only was fresh pork relished, but smoked pork products, especially ham and bacon, appeared in many a Pennsylvania German dish. The smokehouse was therefore a common sight on Great Valley farmsteads. It was usually located within the house's orbit. Smokehouses could be frame, but probably more were brick or stone. The smokehouse was a small building with a roughly square footprint and gable or pyramid roof, and only a few small openings. Inside, hooks and nails provided a place to hang the meat. The care given to architectural detail and finish just confirms the importance of this small building.



Smokehouse, South Annville Township, Lebanon County, c. 1860-75. Site 075-SA-006.

Bake Ovens, Early Nineteenth Century to c. 1900

A few outdoor bake ovens were documented in field study. Some farm women continued to bake bread at home well into the nineteenth century.

Bake Oven, Straban Township, Franklin County, mid-nineteenth century. Site 055-ST-002.

Butcher Houses, Early Nineteenth Century to c. 1900

Most often work at butchering time took place in a summer kitchen or wash house, but some farms had a separate building called a "butcher house." Characteristics of buildings documented as "butcher houses" varied. Butcher houses documented in Lebanon and Lehigh Counties, for example, had ample lighting, siting between house and barn and near the smoke house, interior counters, and set-kettles.

Butcher house, North Lebanon Township, Lebanon County, c. 1900. Site 075-NL-001.

Butcher house, Heidelberg Township, Lehigh County, c. 1900. The interior has a brick housing and two round receptacles for set-kettles. Site 077-HE-007.

Summer Kitchens, Early Nineteenth Century to c. 1900

Throughout Pennsylvania in the late nineteenth century, 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 cookstove. Reliable, affordable coal-burning cookstoves were now far more widely available, just as the wood supply for traditional outdoor ovens diminished. As the cookstove replaced the open hearth, two important consequences followed. Cookstoves 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.

To accommodate the intensified subsistence activity, and to get the hot summertime cooking out of the house kitchen, more summer kitchens appeared. The free-standing kitchen was not a new building type, but it became more common in this period and its use was likely more seasonal than in the past. The typical Great Valley 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. Sometimes 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 and springhouse, Mill Creek Township, Lebanon County, c. 1860. Site 075-MC-008.

Summer kitchen, South Annville Township, Lebanon County, c. 1850-70. Site 075-SA-004.

The examples offered here depict summer kitchens in the Great Valley. Their size, architectural finish, and relationship to the house all reinforce their centrality in the farm economy.

Summer kitchen, Southampton Township, Franklin County, c. 1875. Site 055-SO-001.

Privies, Early Nineteenth Century to c. 1900

Few privies survive from this period, even though every farmstead had one. One rare upscale survival can be seen at Tulpehocken Manor in Lebanon County.

Privy, Tulpehocken Manor, Jackson Township, Lebanon County, c. 1875.

Pigsties, Early Nineteenth Century to c. 1900

Given the importance of pigs in the Great Valley farming economy, the pigsty occupied a prominent place in the farmstead organization. Normally it would be situated at right angles to the barn, on the forebay side. Its distinguishing features include low doors on one eaves side, which allowed the animal to move back and forth between narrow indoor and outdoor pens. An aisle along the opposite side, accessed by a human door in the gable end, allowed humans to enter and tend to the animals safely. Light was admitted through high windows. Often a low pitched shed roof covered the interior pens.

Pigsty, Heidelberg Township, Lebanon County, c. 1870. Note the low doors to the right (pens are gone) and human door on the gable end. Site 075-HE-003.

Pigsty, Heidelberg Township, Lebanon County, c. 1865-75. A rare stone example with decorative brick arches over the doors. Site 075-HE-006.

Machine Sheds, Early Nineteenth Century to c. 1900

With the sharp rise in mechanization came a need for dedicated storage. In the Great Valley region, machine sheds began to appear on farms in and after the mid-nineteenth century. These could be quite elaborate. For example, two-level sheds with a gable-end bank entry often appeared. Another common local type had an asymmetrical gable roof, with two doors in the gable end, one larger and one smaller.

Machine Shed and corn crib, Heidelberg Township, Lebanon County, late nineteenth century. Site 075-HE-009.

Machine Shed and corn crib, Mill Creek Township, Lebanon County, late nineteenth century. Site 075-MC-001.

Machine Shed and corn crib, North Annville Township, Lebanon County, late nineteenth century. Site 075-NA-001.

Root Cellars, Early Nineteenth Century to c. 1900

The root cellar facilitated storage in the pre-refrigeration era, by taking advantage of constant below ground cool temperatures. Some were quite elaborate, with vaulted stone roofs and shelving.

Root cellar, Straban Township, Franklin County, late nineteenth or early twentieth century. Site 055-ST-001.

Root cellar, Schaefferstown, Lebanon County, date unknown. This cellar has a vaulted ceiling.

Root cellar, Keim homestead, Oley Township, Berks County, early nineteenth century.

Lime Kilns, Early Nineteenth Century to c. 1900

Lime was an important product, not only for agriculture but for uses such as mortar and disinfectant. Lime used with clover helped to increase yields and improve soil productivity. Many farms in the Great Valley once had lime kilns, but few have survived.

Lime kiln, South Annville Township, Lebanon County, date unknown. Site 075-SA-003.

Landscapes, Early Nineteenth Century to c. 1900

The most evocative images of landscapes from this period are surely those taken by Berks County photographer H. Winslow Fegley. His views were perforce less idealized than those which appeared in county atlases and local histories. The farm was divided into small, square or rectangular fields, sometimes descriptively named. By this time, sturdy post and rail fencing often divided pastures and fields, and ornamental iron or picket fences set off the house's yard. Most farms had a woodlot and an orchard. Often fruit trees were also planted along a field boundary or property line. Little in the way of fencing remains from this period, and many fields have been consolidated. However, some treelines and property boundaries may date to the nineteenth century, and a few stone or ornamental fences also remain.[58]

Fence and tree windbreak, Mill Creek Township, Lebanon County. The fence has an incised date of 1851, but it is cut into a later concrete reinforcement. Site 075-MC-001.

Stone fence, Antrim Township, Franklin County, date uncertain. Between sites 055-AN-006 and 007.

Evergreen fence line, Montgomery Township, Franklin County, date uncertain. These appear to have been deliberately planted; they are probably Eastern Red Cedar, really a juniper (Juniperus virginiana).[59]

Another notable rural landscape feature that appeared on a few farms was the enclosed family burial ground.

Family burial ground, Franklin County. The stones date mainly from the 1850s.

1900-1940: Diversified Crops, Livestock, and Poultry

The twentieth century saw rapid urban growth in Great Valley cities and towns. Allentown, for example, grew by 46 percent between 1900 and 1910 alone.[60] The Berks County agricultural extension agent reported in 1920: "All of the farms in the County are situated ideally with respect to markets. The city of Reading (110,000 population) and a dozen or more country towns of several thousand population each, afford splendid markets for milk, fruits, vegetables, eggs, meats and produce in general. Railroad and Trolley Express facilities make it quite possible to ship to Philadelphia and other markets outside the County. Eight large public markets, established for years in Reading, bring thousands of producers and consumers together several times a week." Farming families in the region continued to supply these markets and to practice a diversified crop and livestock farming, modified from the previous period. The most important stories during this period concern modernization. The horse slowly gave way to the tractor and auto; sanitation requirements, centralized processing, and fluid milk markets transformed dairying; new crops such as alfalfa made their appearance; and poultry keeping came to occupy a prominent place in the farm economy. Prosperity was succeeded by difficult times in the twenties and thirties, yet for many the farm provided a hedge against hard times. Overall, though, farm numbers declined throughout the Great Valley, while average farm size increased or stayed stable.[61]

Products, 1900-1940

The most important field crops in the Great Valley in the early twentieth century were wheat, corn, oats, rye, and hay. The 1927 census shows that throughout the Great Valley, farms averaged significantly more acres of wheat, corn, and oats than in the state as a whole, and often more hay also. A 1924 Cornell University thesis graphed field crop trends over time (between 1880 and 1923) in Cumberland and Franklin Counties. The data show a notable drop in oats acreage; this was probably because horses were less used for farm power and because oats were not a very profitable crop. Hay, wheat, and potato acreage fluctuated from census to census, but over time did not rise or decline notably. Corn acreage rose perceptibly. Rye acreage increased briefly between 1910 and 1920 only to decline after Prohibition. Yet these minor grain crops like rye

continued to be grown, even if they might bring small profit, because each had a place in the rotation.[62] The livestock – rotation – manure – crop cycle continued to be practiced.

Wheat was grown with notable success on the limestone soils in the Valley. The region had actually increased its relative importance within the state for wheat growing, so much so that George Fiske Johnson pronounced that "the southeastern counties as a group are making wheat history." Though within a national context Pennsylvania wheat farming continued to decline in significance, it is nonetheless notable that Great Valley farming families found it worthwhile to raise wheat well into the twentieth century. The evidence suggests that wheat was valued for several reasons. In 1925 A. C. Berger explained of Lebanon County wheat that "Wheat has retained its position in the cropping systems not only because it is profitable to produce wheat for sale but also because Lebanon County farms require a large amount of straw in dairy and livestock production for bedding." Wheat grown in the region went to several destinations. In Lebanon County in 1924, for example, 130,000 bushels were shipped out to New York City and Philadelphia for eventual export. As well, "the mills of the county, outside of those in the city of Lebanon, mill local wheat exclusively," reported Berger. This flour also ended up in the export trade. In this respect, Great Valley agriculture continued a tradition established in colonial times.

In other parts of the Great Valley, local and regional mills and bakeries supplemented overseas markets for wheat grown in the region; one source noted that in Berks County, pretzel factories bought local wheat.[63]

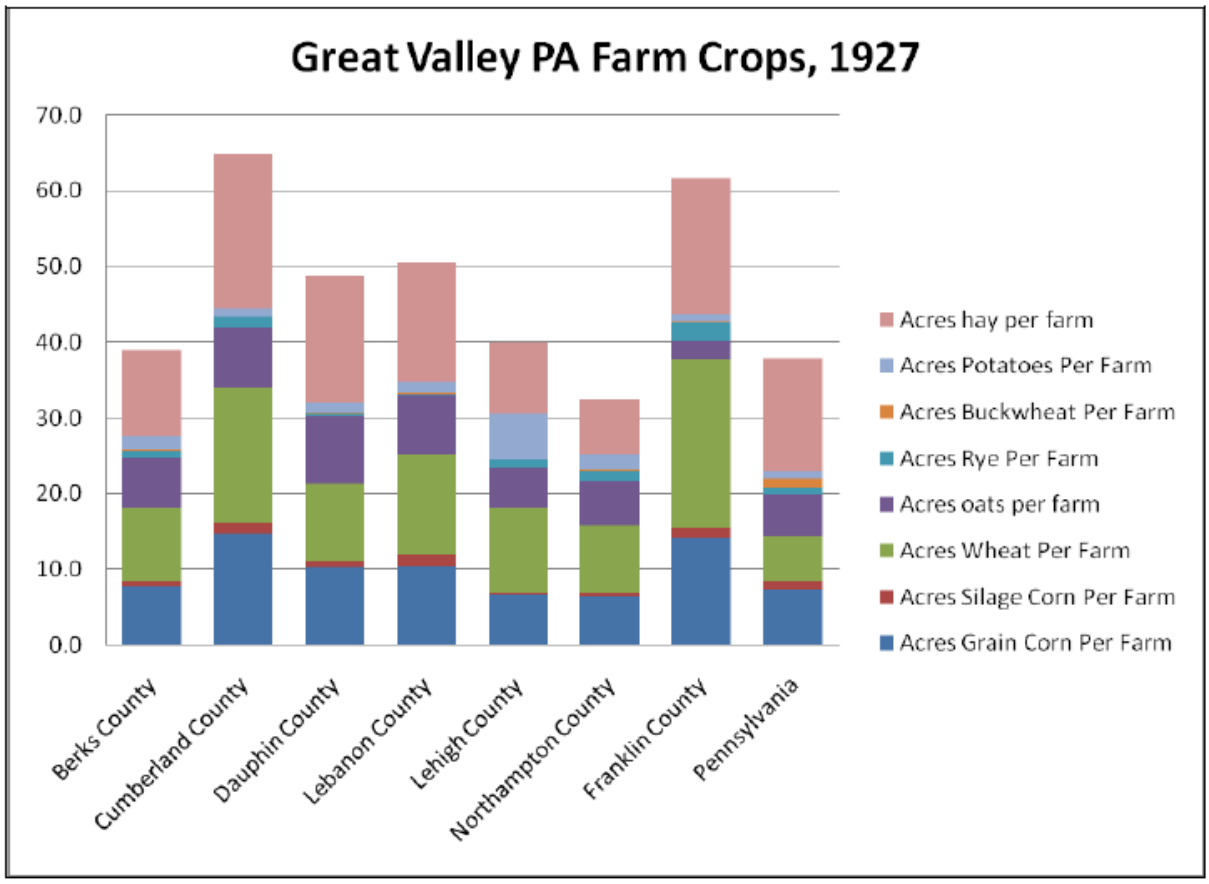
Corn became significantly more important than it had been before, both in terms of acreage and of total production. It was used mainly in animal feed; human consumption was less important than before. The Berks County agricultural extension agent noted in 1915 that "Corn is the principal crop in the rotation on most farms." Acreage-wise, it was third next to wheat and hay. Around 1900, locally-selected varieties prevailed; by 1940, varieties promoted by the Extension service, such as Lancaster Sure Crop, had gained in popularity.

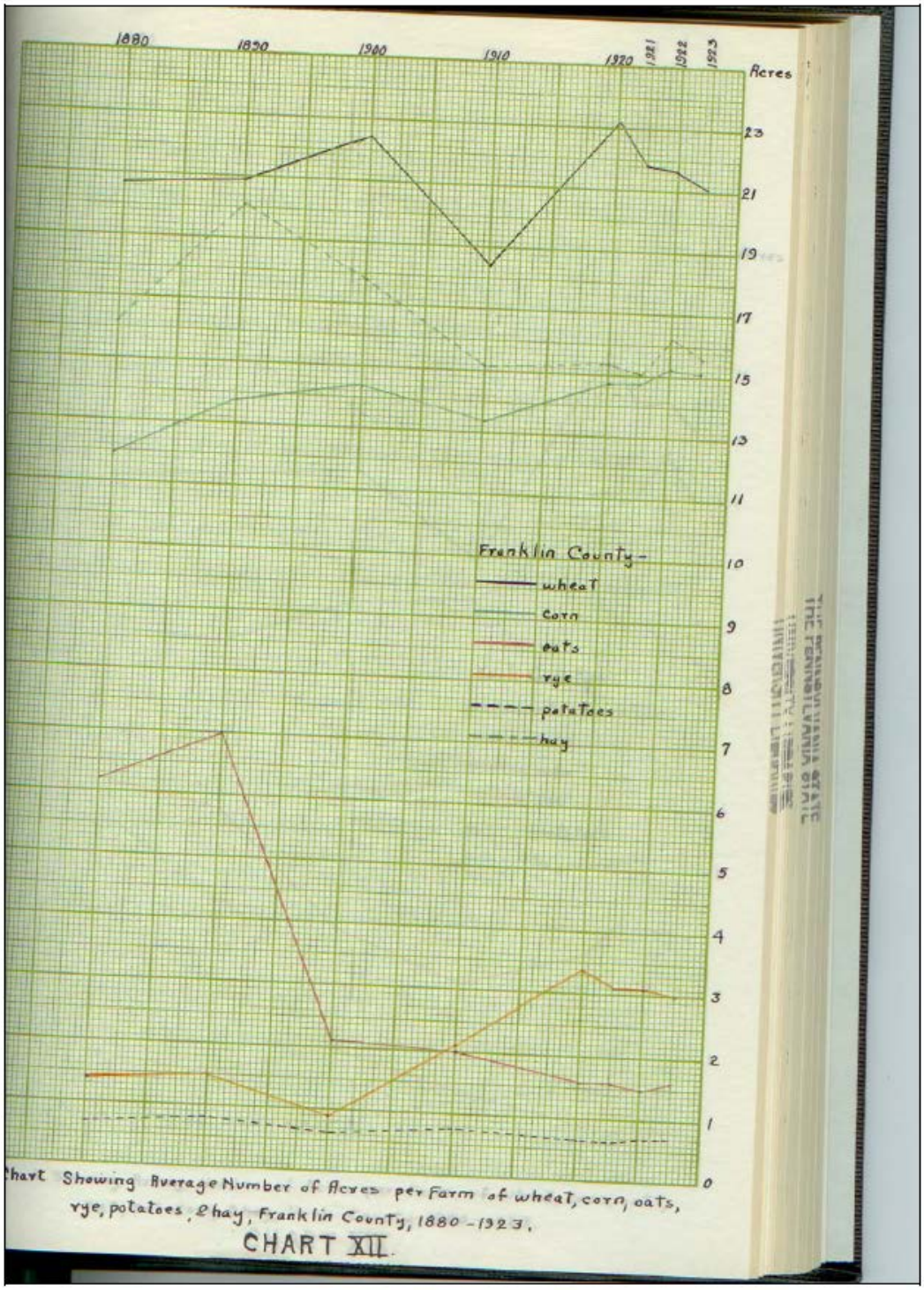
Hay was a valuable crop throughout the Valley.[64] It was mainly fed on the farm, but some was probably sold to urban and industrial markets, especially before about 1925 when horse drawn transport was replaced by trolleys and autos. The most important shift was the trend toward legume hays (mainly clover and alfalfa) and away from timothy. The agricultural extension agents promoted alfalfa, and their advice was taken in some counties. By 1938 the Northampton County agricultural extension agent claimed that there were 10,000 acres planted in alfalfa there.

Potatoes were grown for family use and for market throughout the region. By this time, northwestern Lehigh County and portions of Berks (Albany Township) and Northampton Counties (Moore Township) had specialized in potato production, but in the Great Valley itself virtually all farm families also raised some potatoes. In the 1920s Lebanon County potatoes, for example, were sent out by truck to Harrisburg and also peddled door-to-door after the harvest.[65]

Small amounts of tobacco were grown in scattered pockets.

This is a notable era in crop production, because for the first time, per-acre yields were rising. "Production by expansion," i.e., through adding cropland, had given way to "production by concentration," i.e., improved per-acre yields. This was accomplished by using improved varieties, following better cultivation practices, and in some instances (such as potato and fruit culture) more widespread use of sprays. The extension service tested and promoted newer varieties such as Pennsylvania 44 wheat and Lancaster Sure Crop corn.[66]


Great Valley PA Farm Crops, 1927
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Berks County
Cumberland County
Dauphin County
Lebanon County
Lehigh County
Northampton County
Franklin County
Pennsylvania
Acres hay per farm
Acres Potatoes Per Farm
Acres Buckwheat Per Farm
Acres Rye Per Farm
Acres oats per farm
Acres Wheat Per Farm
Acres Silage Corn Per Farm
Acres Grain Corn Per Farm



Livestock patterns on Great Valley farms continued in many respects as before, with some adjustments. Horses by no means disappeared during this period, but their numbers did decline slowly as farm families acquired automobiles and tractors. Interestingly, at least to the mid-1920s, the number of mules rose, suggesting a trend to less demanding

draft animal power. Perhaps once horses were no longer needed for transport, they were unfavorably compared with mules for draft purposes.

The agricultural extension agents noted that dairying accounted for an increasing proportion of farm income.[67] In Berks County, for example, the agent reported in 1916 that "Dairying is one of the chief agricultural industries in Berks County. The majority of our farmers depend upon their dairy herd for a large part of their cash income." In 1933 the Berks agent had a more specific figure of about 44 percent of county farm income derived from dairying. In Lebanon County in the mid-1920s it was around 38 percent.[68] Yet at least through 1927 the actual number of milk cows on a typical Great Valley farm was not appreciably greater than the state average, and in most cases was actually less than average. Nor had other signs of specialized dairying, such as silage corn acreage, affected aggregate figures much. The overall figures do mask a tendency towards more milk cows in townships with good access to markets, so we may conclude that dairying specialization was occurring within the region, but in fairly concentrated geographic areas. For example, in Dauphin County, there were more milk cows per farm and more silos and silage corn in townships near Hershey; in Franklin County, Peters Township and Washington Township bordered Mercersburg and Waynesboro respectively, and they too had more signs of dairying in the landscape.

The dairy business changed fundamentally during this period. Milk was no longer processed on the farm. It was sold in fluid form for direct consumption or for centralized processing into products like butter, cheese, evaporated milk, ice cream, or candy. In the Great Valley, especially Lebanon and Dauphin Counties, the Hershey Candy Company profoundly influenced dairy production, annually collecting "millions of pounds of milk" from a wide catchment area. Agricultural economist A. C. Berger criticized Lebanon County farmers for relying on Hershey, arguing that they gave up higher prices in the Philadelphia market. However, he also noted that Lebanon County producers "have not met the inspection requirements [of the Philadelphia market]" and we may speculate that perhaps local farmers preferred to sell to Hershey at a sure (if lower) price and not invest in changes necessary to meet more stringent sanitation requirements elsewhere. Though corporate and oral histories suggest that the Hershey Company did monitor farms for cleanliness, it seems that their requirements were still not as stringent as those for fluid

milk to be consumed directly. Hershey Company promotional materials bragged that "Our location helps very much in producing that superior rich flavor in Hershey's milk Chocolate and Almond Bars …. we do all our milking with sanitary milking machines." For candy production, condensing the milk also probably eliminated some microbes. Hershey thus could take less than Grade A milk.

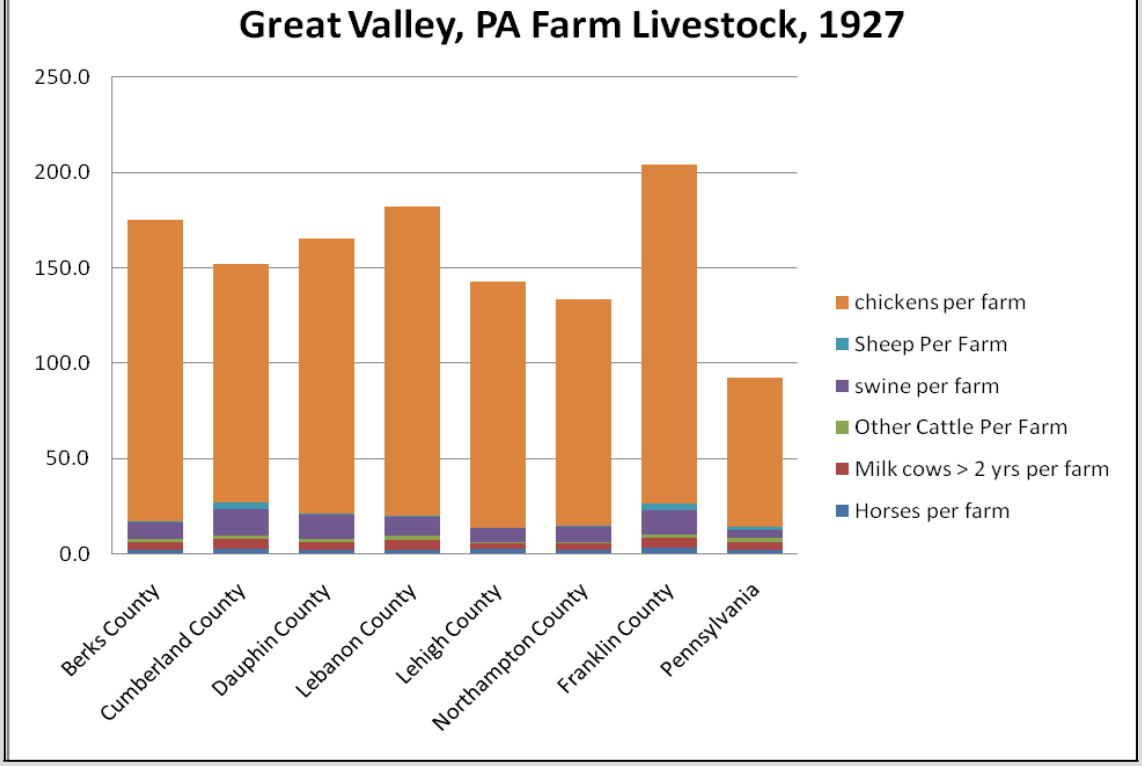
Up to about 1930, milk in cans was transported to the factory by a trolley system extending east to Lebanon and west to Harrisburg. Milk accounted for most of the trolley traffic, and at one point a 3,000 gallon glass-lined bulk tank was put into service. After 1930 milk delivery shifted to trucks. Local dairy farmers depended on Hershey for markets; when in 1937 the CIO-affiliated union of workers at the candy factory staged a sit-down strike, dairy farmers were among those who picketed and even reportedly physically assaulted the strikers.[69]

In general the shift to fluid milk production had important implications for farming. For example, interest rose in higher producing cows, since income now depended on quantity production rather than value-added processing. Breeds such as the Holstein, Guernsey, and Jersey were more often mentioned – though they did not come to dominate immediately. Secondly, quantity feeding and year-round milking became a goal, spurring interest in feed crop improvement and silage. Thirdly, with the rise of a milk-consuming public came demands for better sanitation. Municipal and state government bodies imposed sanitation requirements on milk distributors, and they in turn pressured producers into compliance.[70] Farmers who would not or could not meet requirements had access to some markets but not others.

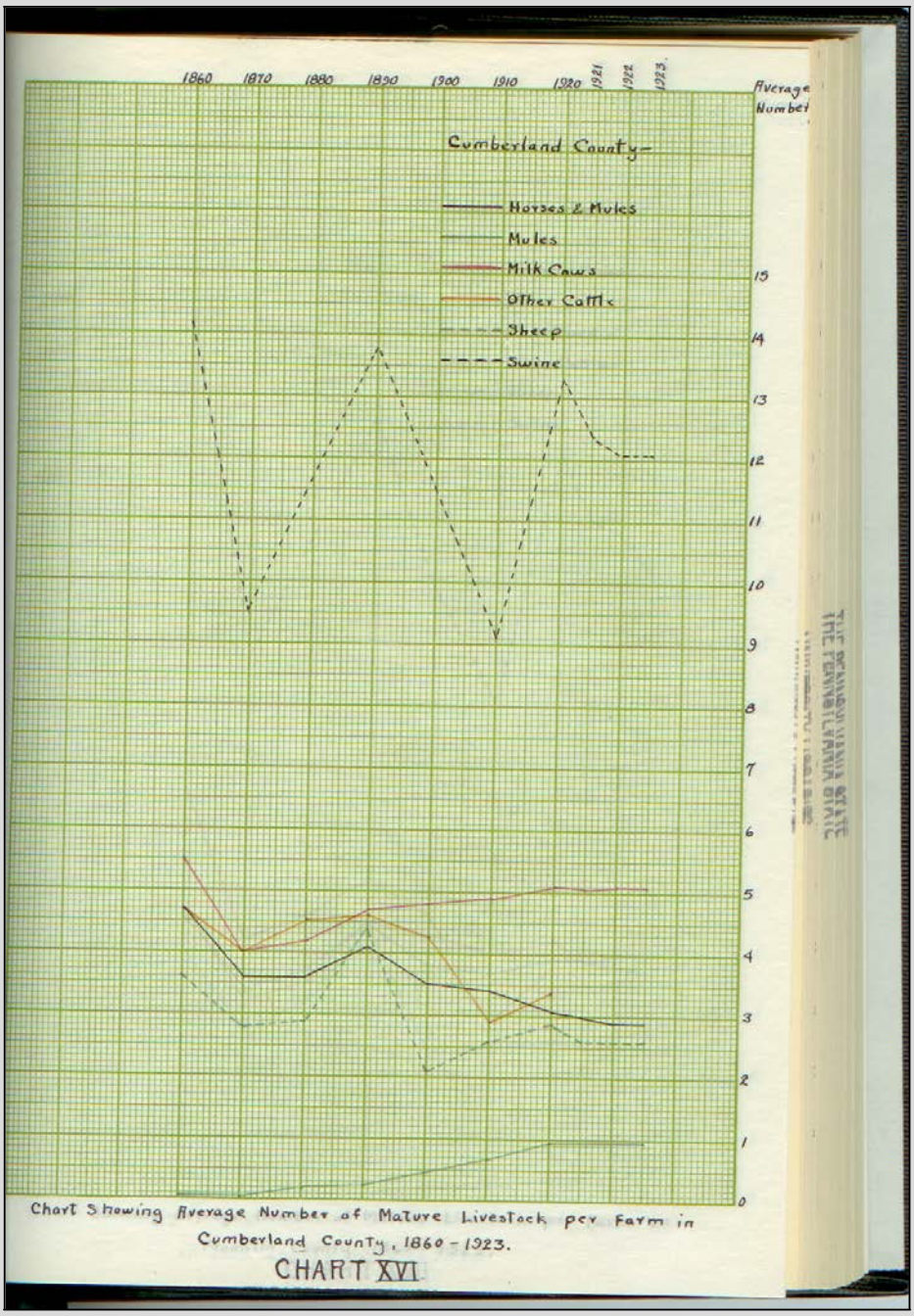
Swine continued to be important in the Great Valley throughout the period. Both high lard-yielding types and leaner breeds were raised. The "heavier farm-raised and fattened hogs, usually old breeding stock," were sold locally or slaughtered for home use, while the lighter ones went to cities within the region.[71] Steers were fed on some farms, particularly in Lebanon County; these animals were shipped out.[72]

The biggest development in the livestock industry was a dramatic rise in poultry products. Great Valley farms quickly outstripped state averages for poultry meat and egg

production. Turkey farming was locally important within the region. The Berks County agricultural extension agent noted in 1932: "Turkey raising is becoming an industry of some note in our county. We have what is believed to be the largest flock in the country, ten thousand and more turkeys raised this year on this farm. Other flocks of 500 to 2,000 turkeys are growing in number. A larger majority of the turkeys sold on our local markets through chain stores and independent stores during the last Thanksgiving season were turkeys grown within our county. The number of imported turkeys on our markets has been reduced to a very small percentage."[73] The vast majority of poultry production, however, was chickens. Poultry products went to local and regional markets. In Lebanon County, for example, a 1925 report noted that "Over 200,000 head of poultry were collected by hucksters in Lebanon County last year," a third of which were sold in the county and the rest shipped to Reading and Philadelphia. Hucksters must have handled nearly all the chickens that were marketed in Lebanon County, because total local production for 1924 was 268,000 birds, and that includes consumption by the farm family. Local marketing cooperatives also seem to have helped poultry farmers. In Berks and neighboring counties, for example, the Tri-County egg auction in 1936 sold around 20,000 cases of eggs, helping to pull local supplies from hucksters and local markets and in turn forcing prices up.[74]



Aggregate figures from the 1927 Pennsylvania state agricultural census show the predominance in the region of swine and poultry.



Paul Edinger, "The Trend of Agriculture in Adams, Cumberland, Franklin, and York Counties, Pennsylvania." MS Thesis, Cornell University, 1924 (no department given), between pages 38 and 39.

Fruit production received a good deal of attention from extension agents during this period. It was a challenging time for orchardists. The San Jose scale infestation descended on the region in the early twentieth century, wiping out many home orchards. In Berks County by 1933 the extension agent thought that "Fruit growers are alert as to

their responsibility in the production of quality fruit if they would meet competition from more distant regions. The farm orchard of a fraction of an acre or a very few acres, is rapidly passing out." The agent was correct, but quite a few small commercial orchards hung on, and in Franklin and Cumberland Counties especially, larger ones on the mountain slopes remained viable.[75] In the other counties, fruit production was concentrated in one or two townships. For example, in 1927 Palmer and Forks Townships, Northampton County, accounted for most of the county's peaches and apples. The orchard areas are clearly visible on period aerial photographs. Some of these products went to local processors, some was sold at roadside stands, some probably was shipped out, and some was sold by huckstering.

Liming of soil continued to be a common practice. The Berks County soil survey of 1909 noted that many farmers had their own kilns and burned limed for their own farms and that of their neighbors. The author took a dim view of lime use, though: "Considering the whole area it may be said that lime is used in too large amounts, and there is considerable waste of time and labor in its application."[76]

As before, myriad smaller-scale production and processing strategies occupied an important place in the farming economy, especially during the lean Depression years. One of the more ingenious and unusual cash-generating activities was pursued by a Berks County farm woman who not only sold conventional goods at the Reading market, but raised raccoons to sell for "coon field trials."[77] However, most farm people concentrated on long-proven strategies. A Northampton County home economics extension survey of 1934 is revealing. The specialist reported that farm families grew between twelve and twenty-seven different vegetables, averaging twenty. On average each family canned 107 quarts, including beets, carrots, corn, spinach, string beans, lima beans, peas, "Sauer Kraut," and tomatoes. Tomatoes were the most popular canning vegetable. The agent added that "... cabbage was stored in generous amounts by all but 12 families... 521 heads of endive were stored by 13 families..." In Berks County that same year, one farm's canning output was described: "The variety of vegetables canned were – squash, eggplant, peas, tomatoes, okra, sauerkraut, beets, succotash, corn, string beans, cauliflower. The fruits were – plums, blackberries, peaches and apple sauce." Other

sources mention cabbage, onions, beans, sweet corn, tomatoes, cucumbers, and sweet potatoes.[78]

These goods as before went both to family subsistence and to market. For example, the Berks County home economics extension agent in 1933 mentioned that "Mrs. William Geiger of Geigertown expects to can asparagus for retail trade."[79] Many families had huckster routes.[80] Cities in the Great Valley served as redistribution points for goods brought in from outside, and also maintained venues for sales of "locally-produced fruit and vegetables." During this period, there were separate marketing processes for local and non-local goods. A thorough 1925 publication describing "Agricultural Production and Marketing in Lebanon County" noted that in the main, "local farm produce is sold generally by the producer to the retailer or directly to the consumer," the latter either at market houses or by "street peddling." Lebanon had city markets to channel goods from the countryside to urban dwellers, but most of the county's fruit and vegetable needs were supplied by Lebanon County farms, and never entered Lebanon City markets at all. The items that came in on railroad cars were things that couldn't be grown locally, like citrus fruits and bananas.[81]

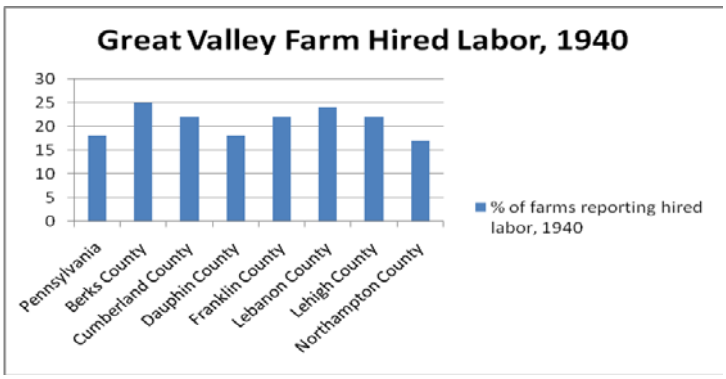
It is difficult to estimate the economic impact of these direct sales, since contemporary agricultural statisticians had few good ways to keep track of them accurately. One 1943 essay about Dauphin County market houses referred to a study which estimated that sales at farmers' markets accounted for "one-fourth of the average annual value of all Pennsylvania farm products sold" other than milk and milk products. Unfortunately the author did not give a citation for that reference. If the assertion was accurate, farmers' market sales could have accounted for a significant portion of the value of Pennsylvania farm products sold annually.

Labor and Land Tenure, 1900-1940

Great Valley farms continued to be worked mainly by family members, supplemented by wage laborers. In 1909 the Berks County soil survey authors noted: "The question of farm labor in Berks County is not as serious as in some sections, because many of the women and children work in the fields. On many small farms, therefore, no extra farm

hands are needed."[82] In 1940, the published US Census figures suggested that no more than a quarter of Great Valley farms used hired labor from outside the family.

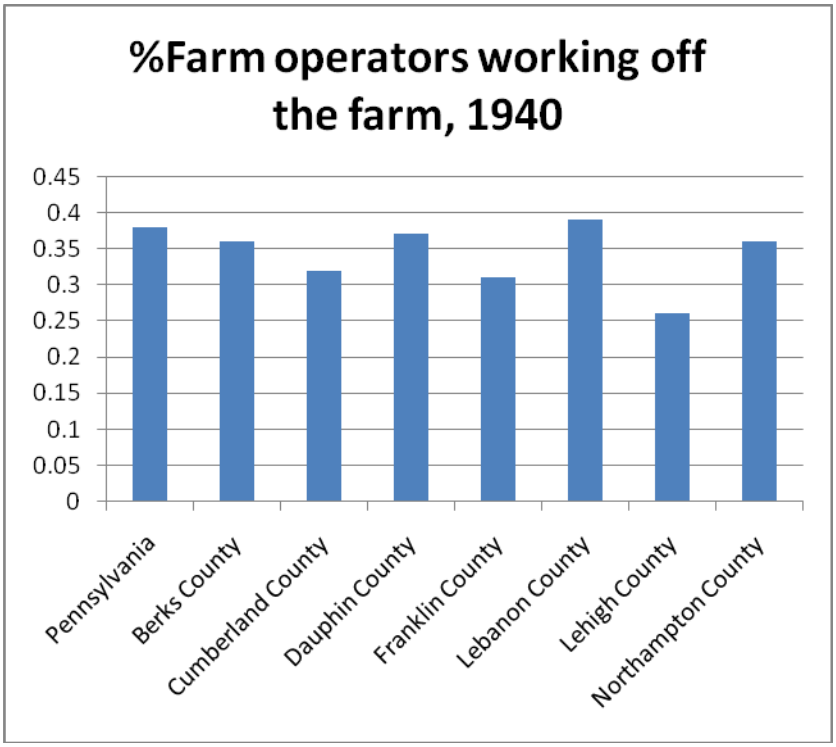
The 1909 soil survey reported that when farmers found outside laborers, they often paid them $15 a month including board. This increased during the summer months, where many laborers were paid $20 a month. Day laborers were often paid a dollar a day, with a raise to $1.25 a day during the time of harvest. By 1925, it seems that farm labor costs had risen in Berks County. That year a local historian complained that "Hired help on the farms of the county is a most serious problem at this time. A wage of $30 to $40, with board, lodging, and washing included is quite commonly paid. This is the equivalent of about $80 to $100 per month. Some farmers are paying men more than this. Day labor on the farms commands $4 to $5 per day. These wages don't seem to be high when compared with wages of tradesmen and industrial workers, but the farmer cannot afford to pay higher wages and in some cases not as high wages as he is paying, because of low returns on crop and livestock products." Industrial employment in the region must have presented competition for labor and driven up wages to some extent, at least until the Depression hit.[83]



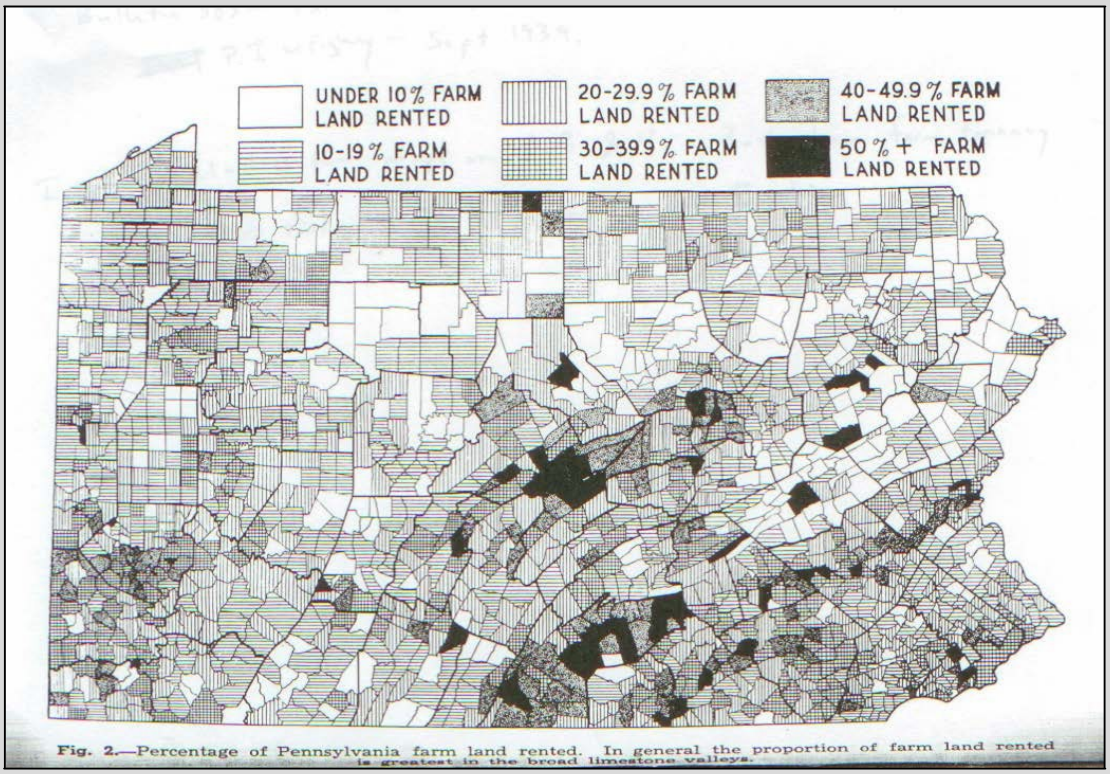
Labor processes and patterns were changed again by a second phase of mechanization, this time by a slow shift away from animal power to steam or fossil fuel powered machinery. The stationary gasoline engine could replace horse power to drive threshers, silo fillers, and the like. Gasoline powered tractors provided draft power in the fields to pull plows, harrows, reapers, and mowers. Automobiles furnished personal transport, and trucks added the ability to transport farm produce. Electricity (either from a power line or from an independent generating plant) could power pumps for running water, lights for

working, and household appliances. Studies in other areas have shown that these new technologies changed work patterns. For example, some farm women found themselves running errands using a car, and perhaps cutting back on work in the fields. Shared communal tasks such as "husking bees" disappeared, but newer ones like silo filling arose. In the Great Valley counties, distinctive farm technology choices were made with respect to statewide patterns. For example, tractors were quite a bit more popular in the Great Valley than in the state as a whole. This makes sense when we consider that mostly the terrain was fairly flat, and crops were so important in the region. Trucks and automobiles were also much more prevalent than in the state as a whole in 1927; nearly every farm had one motorized vehicle and many had more than one. A well developed road network and the importance of huckstering explain these choices. On the other hand, in general the region lagged behind the rest of the state in electrification, running water, and telephones. It is tempting to speculate that these choices reflect a lower status for household work and -- by extension -- for women. No in-depth research has closely examined the issue, but studies for other areas show that families deliberated together about these costly conveniences. Particularly during the depression decades 1920-1940, the farm's viability was the first priority. Moreover, many women chose mobility and maintaining social ties over household appliances. A historical study in a different state quotes one farm woman as saying, "you can't go to town in a bathtub."[84]

Off-farm labor by farm household members was not quite as important in the Great Valley as elsewhere in Pennsylvania, probably because farms were more economically viable than in regions like the Allegheny Plateau. Nonetheless, by 1940 a quarter of all farm operators in the region worked off the farm at least part of the year. Off-farm labor also was related to what agricultural economists called "part-time" farms. Part-time farms surveyed in Berks and Northampton Counties in the 1930s showed that farm products accounted for less than twenty percent of farm income, and off-farm employment for three-quarters. Textiles and slate/cement industries offered employment in these Berks and Northampton respectively. Women and children did most of the work on these farms. Off-farm labor statistics were only collected for farm operators, i.e., male household heads; the impact of women's wage labor is therefore difficult to ascertain.



Tenancy continued to be a central institution in the Great Valley. In 1927 tenancy ranged from around 20 percent in Northampton County in 1927 to 40 percent in Cumberland County. (State wide, it was 25%.) In general, higher tenancy rates seem to have been correlated with the percentage of farmland that was rented in a given area. (In other areas, southeastern Pennsylvania for example, the overall percentage of tenants was low, but they farmed a disproportionate land area, indicating that a different social dynamic was at work.) As before, share tenancy was the most common form of landlord:tenant relationship. Some agricultural economists believed that changing conditions rendered share leases less effective than before, but they seem to have persisted anyway.[85]



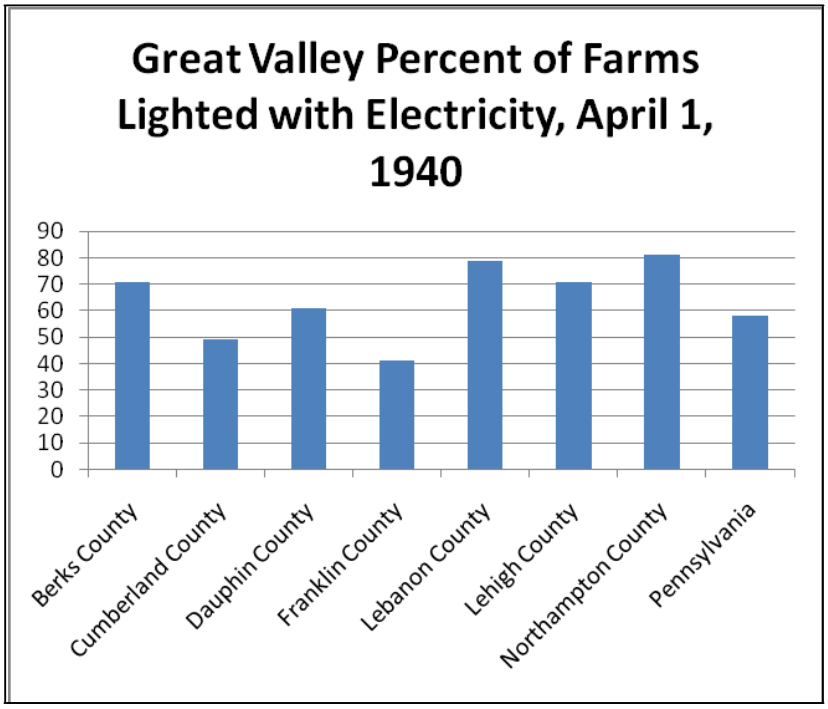
Map showing the percentage of farmland rented by township. A darker swath coincides approximately with the Great Valley, from Northampton County in the northeast down to Franklin County. Paul I. Wrigley, "Farm Tenancy in Pennsylvania," Pennsylvania Agricultural Experiment Station Bulletin #383 (September 1939), 4.

Buildings and landscapes, 1900-1940

Houses, 1900-1940

The large and substantial houses built in the previous century continued to serve farm families in the Great Valley. In Cumberland County, for example, one study concluded that half the farmhouses in use in 1940 had been built before 1900. The chief changes to older farm dwellings would be the slow installation of electricity, running water, and (in some places) central heating. However, as the chart below shows, relatively few farms in the Great Valley had these conveniences even by 1940. Two-thirds of Cumberland County houses lacked indoor toilets and bath facilities, while a fifth lacked electricity as late as 1945. Notably, 23 percent of Cumberland County farm dwellings in 1945 housed more than one family – probably reflecting kinship based farm tenancy.[86] As far as architectural style was concerned, few houses documented in field study appeared to have

been updated during this period. The stability in architectural form and fashion can be attributed to Pennsylvania German cultural conservatism; economic stress, particularly after 1920; and the basic soundness of the nineteenth century house. Since family and household size probably declined, and less agricultural work was performed there, these Pennsylvania Farmhouse types probably sufficed well in the twentieth century.



Those few new houses documented for the period were bungalows and foursquare houses. These were popular forms in the early twentieth century, and their appearance in the countryside shows that Great Valley farm families didn't always reject new styles.

Bungalow, Hamilton Township, Franklin County, c. 1925-1940. Note the matching smokehouse in the rear. Site 055-HA-001.

Bungalow, Lurgan Township, Franklin County, c. 1925-1940. Site 055-LU-001.

Foursquare house, Heidelberg Township, Lebanon County, c. 1910-1940. Site 075-HE-004.

Barns, 1900-1940

Few new barn types were documented that date securely to this period. Rather, nineteenth-century Pennsylvania forebay barns continued to serve. They were often extensively altered. Two main alteration strategies were documented in the Great Valley region. One was adaptation of the Pennsylvania forebay barn for poultry. The other was renovation to comply with dairy sanitation standards. Each renovation has a distinct and recognizable architectural signature.

Barn in Berks County adapted for poultry. On the stone foundation of an earlier Pennsylvania Barn, a two story shed-roof enclosed addition was built over the forebay area. Windows admitted light and a chute in the front center permitted waste disposal. Berks County Agricultural Extension Agent Report for 1929.

As poultry increased in numbers and importance, barn adaptations for chickens became more common. Barns adapted for poultry are easy to spot; their walls have been pierced by numerous small openings for light, and often they are clad with shingle or other material to keep out drafts. Inside they may be fitted with nesting boxes, perches, and facilities for waste collection and disposal.

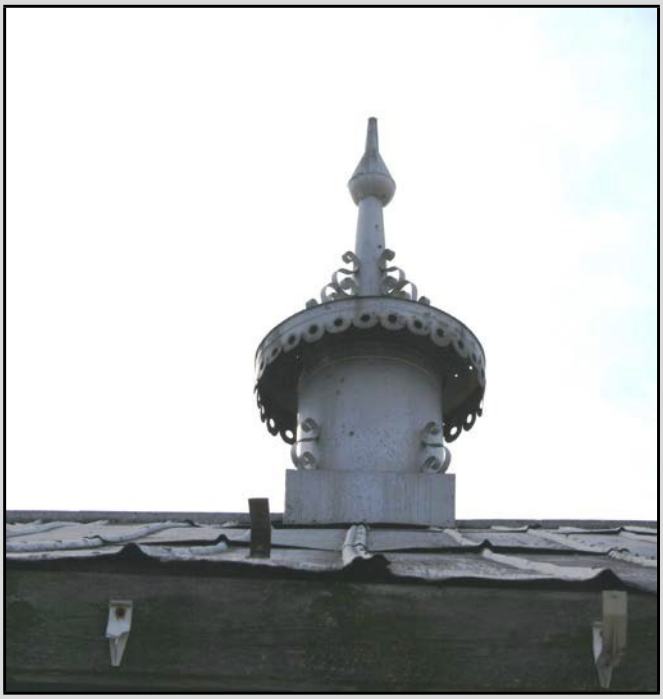
Pennsylvania forebay barn remodeled for poultry. The forebay has been enclosed and openings cut into the eaves and gable walls. A two-story addition extends off the bankside. Berks County Agricultural Extension Agent Report for 1926.

As agricultural conditions changed, dairy farmers were encouraged, and eventually required, to remodel their barns. By the twentieth century, scientists had connected diseases like bovine tuberculosis to human illness, and efforts began to find ways to test herds and move towards decreasing (if not eradicating) animal diseases. The germ theory of disease helped to foster an emerging critique of the Pennsylvania Barn as unsanitary and unhealthy. The forebay and lower-level basement animal quarters were now regarded as liabilities: the forebay because it kept out germ-killing light from an already dim interior, and wood stalls because they were thought to harbor germs. The short crosswise ranks of stalls were also criticized as inefficient for farm labor. These views were expressed through reform literature and eventually legislation. In the twentieth century, increasing concerns about the safety of the milk supply prompted municipalities and states to legislate sanitation requirements for producers. At the end of 1932, the Berks County agricultural extension agent reported that "The New Jersey milk law which goes into effect January 1, 1933, affects several hundred producers in Northern Berks. More light in the stables, all floors concrete, horse stables separated by tight partitions, and a number of other requirements are resulting in a hardship to these producers at this time." Other recommended or mandated changes might include installing manure alleys

and metal stanchions, and improving ventilation. Some regulations required that pigsties be located at a distance from cow stables. Gradually these requirements extended over a larger and larger number of dairy farms. Their cumulative impact can be seen on the landscape.[87]

Pennsylvania brick-end barn adapted for dairy, Lurgan Township, Franklin County. Originally built 1858, altered in the early twentieth century. Site 055-LU-004.

Pennsylvania forebay barn adapted for dairy, Washington Township, Franklin County. Original construction late nineteenth century, adapted early twentieth century. Note the canted metal framed windows combined with concrete block wall and traditional Dutch doors. Site 055-WA-003.



Decorative barn ventilator, Guilford Township, Franklin County, early twentieth century. Site 055-GU-003.

Pennsylvania Barn interior under enclosed forebay showing concrete floor, manure gutter, metal stanchions, and metal framed windows, Washington Township, Franklin County. Original construction late nineteenth century, adapted for dairy in the twentieth century. Site 055-WA-003.

"Extra light for Stables," photos from Berks County Agricultural Extension Agent report for 1936.

Smokehouses, 1900-1940

Butchering and meat smoking continued to have a strong presence in local life and thus in the landscape. New smokehouses from this period are relatively common.

Smokehouse, Jackson Township, Lebanon County, c. 1935. Site 075-JA-009.

Smokehouse, Peters Township, Franklin County, c. 1920-40. Site 055-PE-005.

Summer Kitchens, 1900-1940

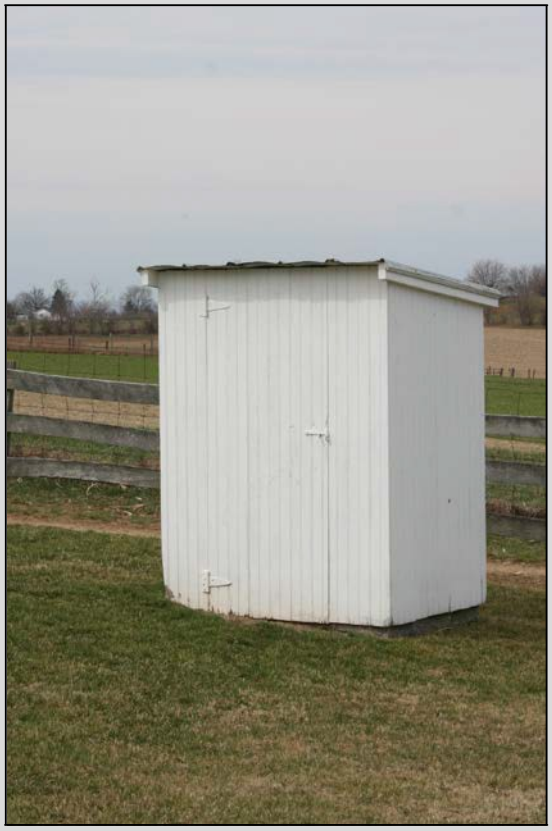
Summer kitchens continued to be intensively used, so new ones were built during this period. Twentieth century summer kitchens tended to be light frame structures, clad in beaded board or plain board siding. They lacked fireplaces, but often might have a built-in brick housing for a set-kettle. Documented examples also tended to be a bit farther from the house than their nineteenth century predecessors, though too few examples were surveyed to detect a consistent pattern. Otherwise, their function was the same as in the nineteenth century.

Summer kitchen, Antrim Township, Franklin County, early twentieth century. Site 055-AN-006.

Summer kitchen, Heidelberg Township, Lebanon County, c. 1925. The interior contains a built-in brick set-kettle and there is a bake oven off the end. Site 075-HE-003.

Privies, 1900-1940

Indoor toilets were rare in the rural Great Valley well into the twentieth century. The privies documented in field study dated to about 1925-50.



Privy, Washington Township, Franklin County, c. 1925-45. Site 055-WA-003.

Privy, North Annville Township, Lebanon County, c. 1925-45. Site 075-NA-001.

Pigsties, 1900-1940

During field study, anecdotal evidence from property owners indicated that pigsties were more numerous before dairy regulations forced their removal away from cows and milk. At some sites, then, pigsties were moved or torn down. However, examples were nonetheless documented from this period. Swine occupied such an important place in Pennsylvania German agriculture and cultural life that housing them continued to be necessary.

Pigsty, South Londonderry Township, Lebanon County, c. 1940. Site 075-SL-001.

Pigsty, South Annville Township, Lebanon County, c. 1930-50. This building later served as poultry housing. Site 075-SA-006.

Machine Sheds, 1900-1940

The second wave of agricultural mechanization brought with it a renewed need for shelter to conserve these expensive implements.

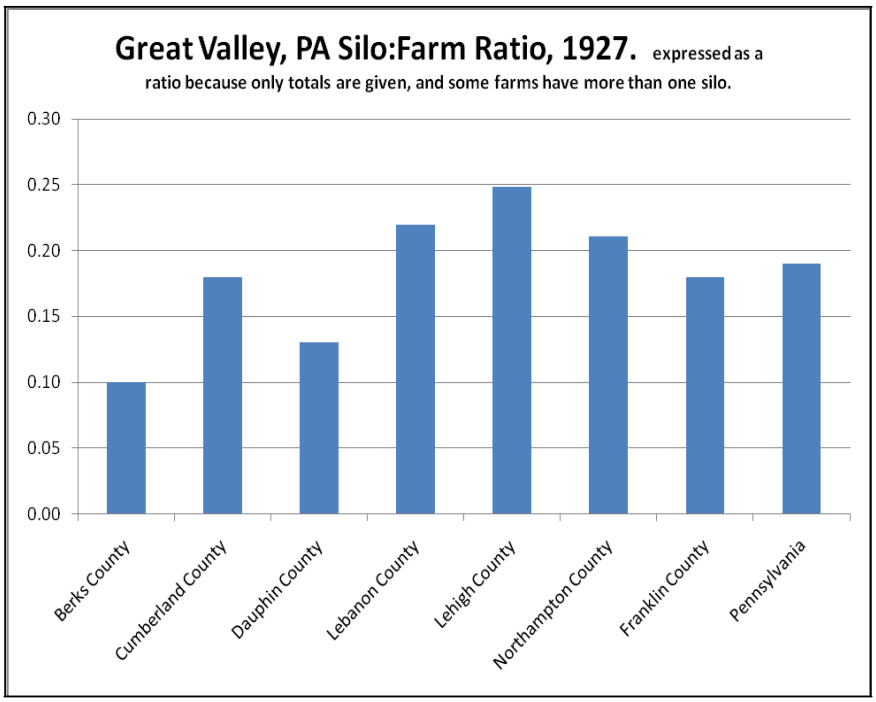
Machine shed, Antrim Township, Franklin County, c. 1925-45. Site 055-AN-011.

Machine shed with corn cribs, added bays, and poultry windows, Swatara Township, Lebanon County, c. 1925-1945. Site 075-SW-002.

Silos, 1900-1940

A significant new outbuilding to appear on the agricultural landscape in this period was the silo. A silo is an airtight structure that holds fresh organic matter (moisture content 50-65 percent) destined for winter animal feed. It is filled with shredded or chopped grass, corn, or sometimes other plant material, which ferments into a highly nutritious 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 nineteenth century when the results of experiments in Europe became known. In the Great Valley, its adoption occurred over a long period. In

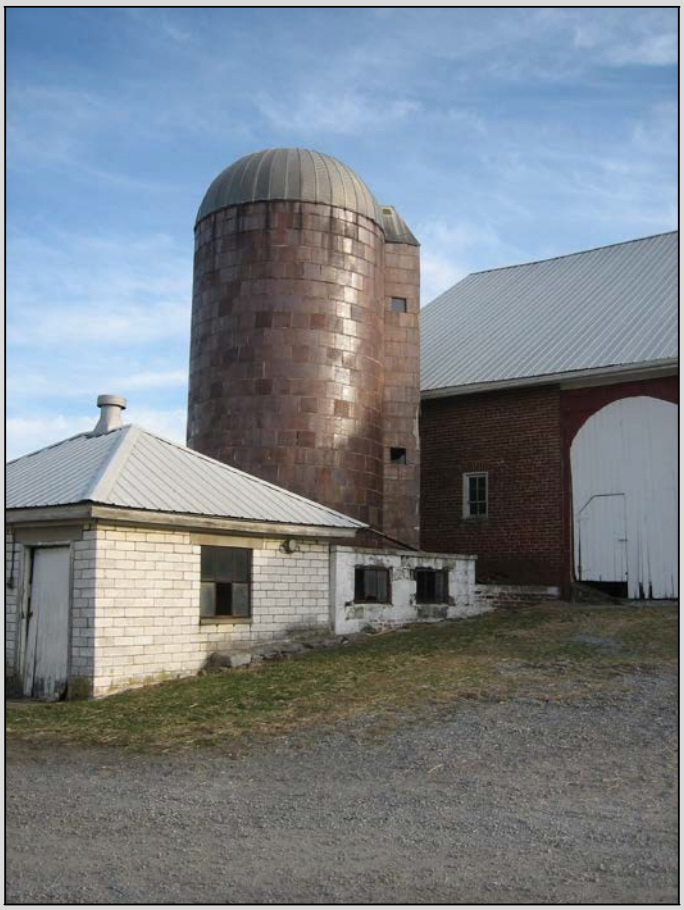
the Great Valley in 1927, some counties had more silos than in Pennsylvania as a whole, while others had fewer; but in any case, no more than a quarter of farms in any county had silos. Overall, silos were not as prominent a feature in the Great Valley as they were in more heavily specialized dairy areas such as the Northern Tier. The number surely increased by 1940, but no data are available to determine exactly how much.



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). Early silos were unloaded by hand, from the top. The land-grant establishment published many "how-to" brochures aimed at helping farmers build their own silos of wood or concrete. A 1918 Pennsylvania State College circular mentioned wood stave, hollow tile block, poured concrete rings, concrete staves, concrete blocks, metal, and bricks as silo construction materials.[88] Commercial organizations marketed many types of silos too. Some sold special curved brick; others made tiles; still others advertised systems depending on interlocking rings of poured concrete. Cement staves became

popular after about 1910 and continued in popularity for several more decades. Galvanized iron was a less important but not uncommon material.[89]

In the Great Valley, the earliest extant exterior silos documented in field study date from this 1900-1940 period.

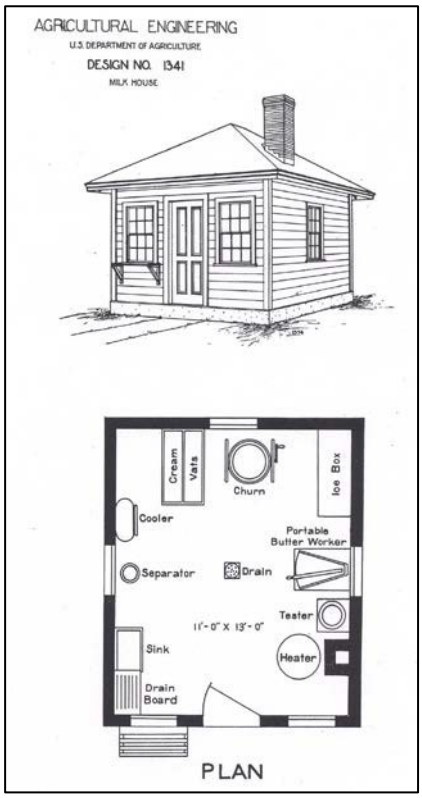


Tile silo, Washington Township, Franklin County, c. 1930-1950. Site 055-WA-002.

Metal silo, concrete stave silo, and poured concrete silo, Straban Township, Franklin County, c. 1940, 1950, 1970 respectively. Site 055-ST-003.

Tile silo, South Annville Township, Lebanon County, c. 1935. Site 075-SA-001.

Milk Houses, 1900-1940



Milk House #1341, USDA design taken from: USDA Office of Cooperative Extension Work and Bureau of Public Roads Cooperation, *Farm Building and Equipment Plans and Information Series*, 1929.

Sanitation regulations resulted in important architectural changes. 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.[90] 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 nineteenth and early twentieth 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.[91] It is not clear how well these were enforced. These regulations were one 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 the Great Valley, these regulations took effect over a protracted period. The milk house was one product of these new laws. In turn, its form and construction were influenced significantly by the agricultural establishment (meaning the complex that included state departments of agriculture, the land-grant university and

extension apparatus, and agribusinesses). This new element in the farm landscape, therefore, illustrates the growing influence of the "agricultural establishment" on everyday farming practices and landscapes. Agricultural extension agents regularly disseminated plans for milk houses. Likely, for every farmer who followed a plan exactly there were more who either copied his building, or who adapted the basic guidelines using available materials and expertise. 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 (in one instance, "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[92] 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 example had a churn, butter worker, ripening vat, and refrigerator, and another had quarters for workers. Another small, 12 by 14, one-room milk house 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 feet, had a concrete foundation with a sunken vat for cooling cans of milk.[93] All of these plans had sloping floors with drains, and provision for ventilation and light. After about 1950, milk houses were sometimes altered to accommodate bulk tanks.

Following is a selection of milk houses documented in field study in the Great Valley.

Milk house, Jackson Township, Lebanon County, c. 1920-40. Site 075-JA-009.

Beveled block milk house, North Cornwall Township, Lebanon County, c. 1930-1940. Site 075-NC-002.

Milk house, Antrim Township, Franklin County, c. 1930. Site 055-AN-001.

Poultry Houses, 1900-1940

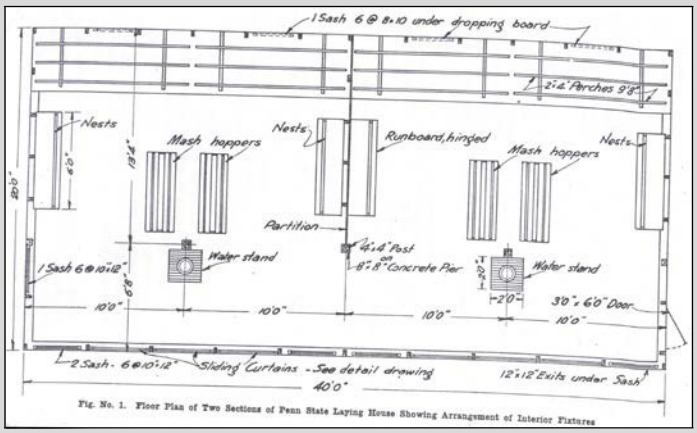
With the increasing importance of poultry in the farm economy came greater attention to poultry housing. Renovated barns accommodated poultry in some cases, but separate houses were also common. Poultry housing in the area tended to be frame, shed-roof buildings, usually one story, with south-facing windows. These sheltered both layers and broilers. The agricultural extension agents promoted designs distributed by the land-grant colleges. The 1926 report from the Dauphin County agricultural extension agent, for instance, described a demonstration poultry house built by the extension office:

> Quite a few farmers were aided in the item of poultry house construction and one demonstration poultry house was built which we feel was typical of what a farm poultry house should be. Taking into consideration the item of economical construction, the use of the building in case poultry was dropped on the farm and it was patterned after the Missouri type house with the exception of more overhead room for storage, and the farmer can put in this poultry house all the feed, straw, and green feed needed for 300 hens for the Winter. This house has in addition electric lights, special mash feeding troughs and running water. The cost… per bird for housing in this house was $2.25.[94]

In this period, total confinement systems had not yet developed. On many farms, chickens were pastured at least part of the time, in what would today be called "free range" systems. Often poultry houses were designed to be movable, because it was recognized that the birds needed to be moved to fresh ground periodically, not only to get benefit of fresh plant growth and insect populations, but also to avoid the spread of disease. The shed-roof house on skids and the colony house were two types of movable poultry related buildings. Another specialized type of house was the "peepy house," a small heated building that provided warm temporary shelter for newly hatched chicks.

Poultry housing illustrated in the 1927 Berks County Agricultural Extension agent report. The buildings depicted on the left would be put on skids so that they could be periodically moved to clean pasture.

No historic turkey houses were documented in field study.



Penn State Poultry house floor plan. From T. B. Charles, T. B. "Poultry Housing for Pennsylvania." Pennsylvania State College Agricultural Extension Circular # 91, February 1922.

Poultry house, Bethel Township, Lebanon County, c. 1930. Site 075-BE-001.

Poultry house, Heidelberg Township, Lebanon County, c. 1940. Site 075-HE-001.

Colony house, South Annville Township, Lebanon County, date unknown. Site 075-SA-004.

"Peep" house, Peters Township, Franklin County, c. 1940. Site 055-PE-005.

"Chicken and brooder houses," Stamm Farm, Penn Township, Berks County. According to the HABS documentation, the house in the foreground is the oldest, but no date is given. The shed roof building in the background was probably built in the mid-twentieth century; it stands on concrete piers that were made by pouring wet concrete into barrels. The brooder house at right is a metal building, probably prefabricated. These "peepy" houses were popular in the early twentieth century. Digital ID http://hdl.loc.gov/loc.pnp/hhh.pa0163

Corn Cribs, 1900-1940

The corn crib continued to be an important storage building on Great Valley farms during this period. Often, as before, the crib was integrated into another structure, usually a machine shed.

Corn crib, Heidelberg Township, Lebanon County, c. 1940. A late example of canted sides. Site 075-HE-001.

Corn crib, Heidelberg Township, Lebanon County, c. 1940-45. Site 075-HE-005.

Corn crib, Mill Creek Township, Lebanon County, c. 1940-60. Site 075-MC-007.

Garages, 1900-1940

Even by 1927 virtually every farm family in the Great Valley had at least one motor vehicle. These valuable machines needed protection. Often a pre-existing building was adapted for a garage, but early purpose-built garages also appear on quite a few farms documented in the Great Valley. Their architectural characteristics include small scale (one or two bays); siting near the house and on a driveway; materials such as concrete block, rock face concrete, and beaded board; large hinged doors ("garage" style doors are

later insertions); and gabled, hipped, or pyramidal roof. Like its predecessor the carriage house, the garage tended to have a little more in the way of architectural finish or decorative materials than would a farm machine shed.

Garage, Washington Township, Franklin County, c. 1920-35. This building may have originally been a carriage house. Site 055-WA-003.

Garage, Heidelberg Township, Lebanon County, c. 1930-50.

Garage, Heidelberg Township, Lebanon County, c. 1920-40. The garage style door is a later addition. Site 075-HE-004.

Garage, North Cornwall Township, Lebanon County, c. 1930-50. Site 075-NC-001.

Less Common Outbuildings and Structures, 1900-1940

In field and archival research, other buildings and structures were encountered infrequently. They are not "representative" of farmstead architecture in the Great Valley in the sense of being typical buildings found on a majority of historic farmsteads. Yet they do illustrate important, region-wide trends in Great Valley agriculture in this period, so they are described here.

Chop house: A "chop house" was documented in Lebanon County. This was a small, frame gabled building with two gable-end hinged doors opening in opposite directions. The chop house was sited at the end of the barn's gable-end shed-roof extension, at one corner of the barn yard. Here a hammer mill attached to a tractor belt chopped feed for the family's dairy cows and steers. According to an interview with the current owner, the family kept dairy cows and sold milk to the Hershey Company; and they fed a dozen or so steers (oats, corn, wheat, barley, and hay) and sent them to the Lancaster Stockyards and to a local butcher. Corn cobs were chopped to provide litter for the several hundred chickens kept by the informant's mother, who sold eggs to a traveling huckster. Though the chop house was an uncommon building, it related directly to important livestock enterprises in Great Valley agriculture of the time.

Chop house, Heidelberg Township, Lebanon County, c. 1925-50. Site 075-HE-001.

Chop house interior, site 075-HE-001.

Pump House: On several farms, a well with pump was protected from the elements by a small building housing the pump itself and the well housing. Water for stock and humans was critical and so the pump house protected this important resource. Architecturally the pump house can be differentiated from other small outbuildings (milk houses, most notably) by its smaller size and by its location – dictated by the well's site and not, as with milk houses, necessarily near the barn or roadside.

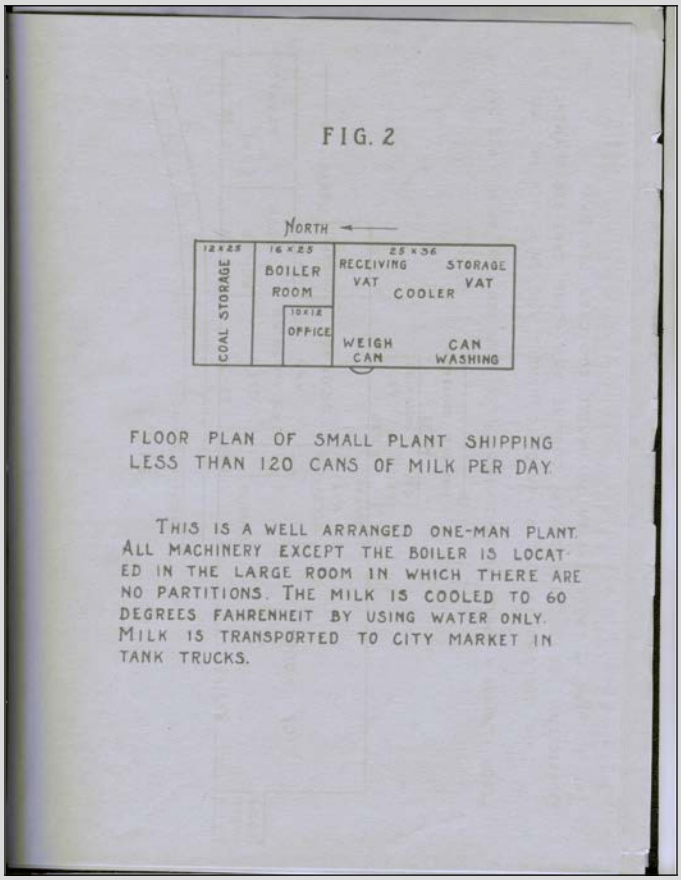
Pump house, South Annville Township, Lebanon County, c. 1930-40. Site 075-SA-004. This pump house function was given by someone familiar with the site. It sits on a concrete platform in the barn yard, about twenty-five feet from the barn forebay. This site also has a milk house, sited at the barn's gable end directly on the farm lane.

Pump house (foreground) and summer kitchen, Antrim Township, Franklin County, c. 1910-40. Note the small size, extended roof for added protection from the weather, and the location next to a summer kitchen.

Milk Station: Two sites (one in Berks and one in Lebanon County) had a building which has been tentatively identified as a milk station. A milk station was a building where farmers brought milk in cans. At the station it was weighed, tested, cooled, and held for shipment in refrigerated rail cars. The building depicted below had elevated receiving doors; ample light for work within; and a covered "pay" window where record keeping and paperwork could occur. A rail line once went past the building only a few yards away. State Route 501 runs past the Berks County station.

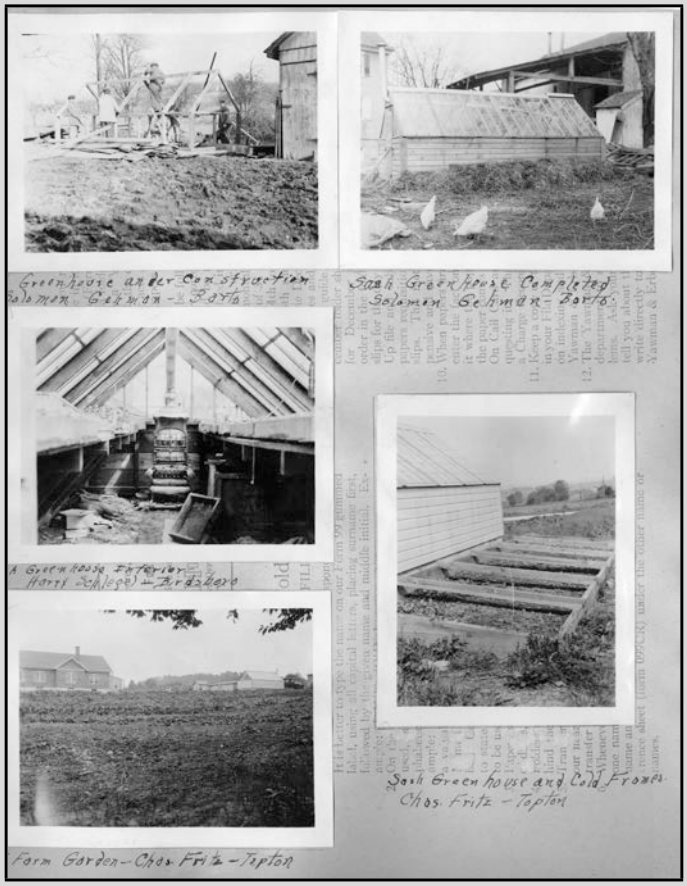
Milk station (?), Mill Creek Township, Lebanon County, c. 1930. Site 075-MC-008.

Milk station, Tulpehocken Township, Berks County, c. 1940. This building is located along Route 501 at the end of a long farm lane.



Floor plan of a milk station. From Walter Gregg, "Milk Marketing in Pennsylvania Shipping Station Operations," Thesis, Pennsylvania State College, 1931. This building is larger than the one depicted above.

Sash greenhouse: The Agricultural Extension reports for Northampton, Berks, Dauphin, and Cumberland Counties all mentioned sash greenhouses in their reports, especially in the 1920s and 1930s. In Cumberland County, for example, the agent reported that a 10 by 30 "Plant growing house" had been erected on a farm owned by John Weitzel of Hampden Township. These small buildings would be used by truck farmers to raise vegetable plants from seed. They would have supported huckstering activity. None were documented in field study.



Sash greenhouses. Photo from Berks County Agricultural Extension Agent report for 1928.

Windmill: Technical improvements in the late nineteenth century made windmills affordable on farms, and several twentieth century models were documented in field study. The farm windmill primarily provided power for such tasks as pumping water and runnning small equipment. Usually they were located near the house, but sometimes they were housed within the barn.

Farm windmill, Antrim Township, Franklin County, c. 1920. Site 055-AN-011.

Aermotor USA A-702 windmill, Bethel Township, Lebanon County. This model was manufactured between 1933 and 1969. This particular windmill probably dates between 1933 and 1950. It ran a pump which is still attached, though no longer used. Site 075-BE-001.

Cistern: Before electric-powered pumps provided running water, farm buildings were often equipped with cisterns designed to collect water runoff from a barn or house roof. Extant cisterns are not plentiful, nor are they always visible, but they do illustrate what probably was a common solution to obtaining water.

Cistern, North Newton Township, Cumberland County, date uncertain. Photograph by Susan Cabot.

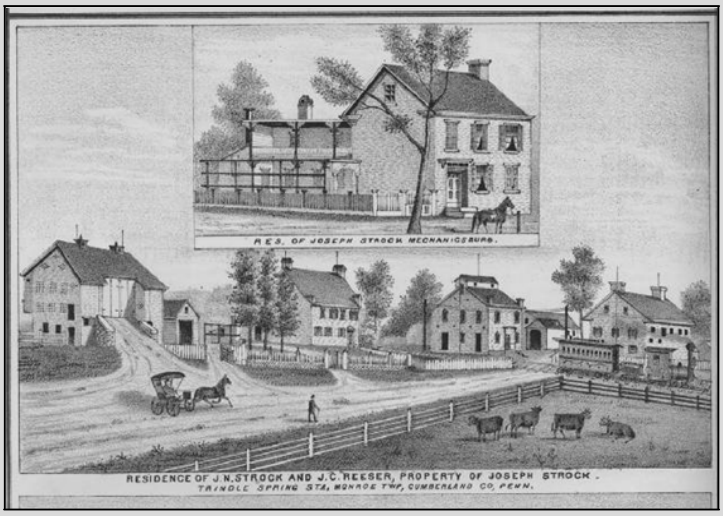
Cistern, Antrim Township, Franklin County, early twentieth century. Site 055-AN-005.

Landscape Features, 1900-1940

Farmstead landscaping: During this period, landscaping on the farmstead grounds began to receive more attention. Winslow Fegley's Berks County photos from the early twentieth century, for example, show houses and vegetable gardens surrounded by picket fences. Few if any of these fences survive, but some large evergreen and deciduous shade trees planted in this era still remain.[95] Lawns began to appear, further setting the

house apart from the other farmstead buildings. The traditional Pennsylvania German garden was organized into squares separated by boarded walks. These features are long gone.

Farm house with shade trees, Antrim Township, Franklin County. Date unknown. Site 055-AN-001.

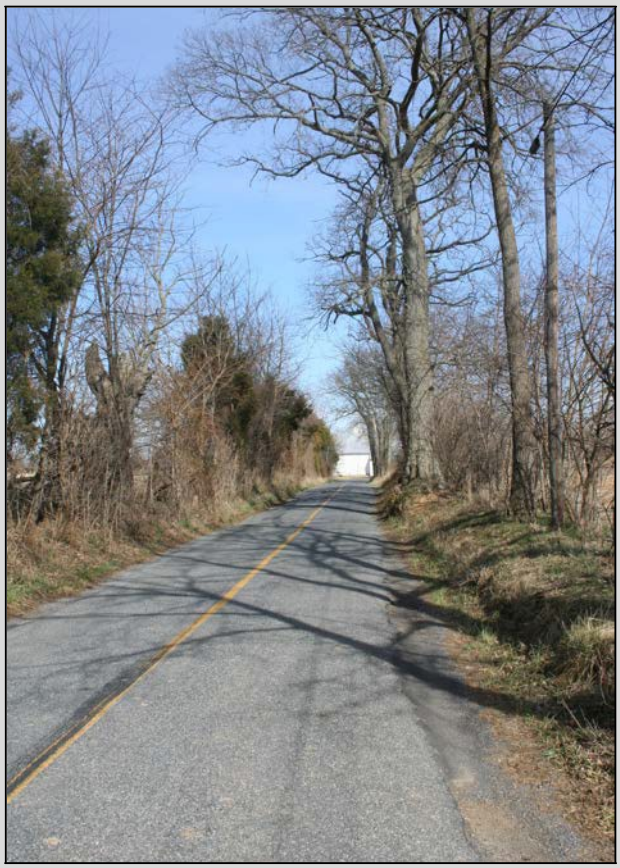


Strock farm, Cumberland County, showing picket fence, farm lanes, yard trees. From Conway Wing, *History of Cumberland County, Pennsylvania* (Philadelphia, 1879), 221.

Farmhouse with shade trees and picket fence, Straban Township, Franklin County. The fence is new, but the trees are mature. Site 055-ST-003.

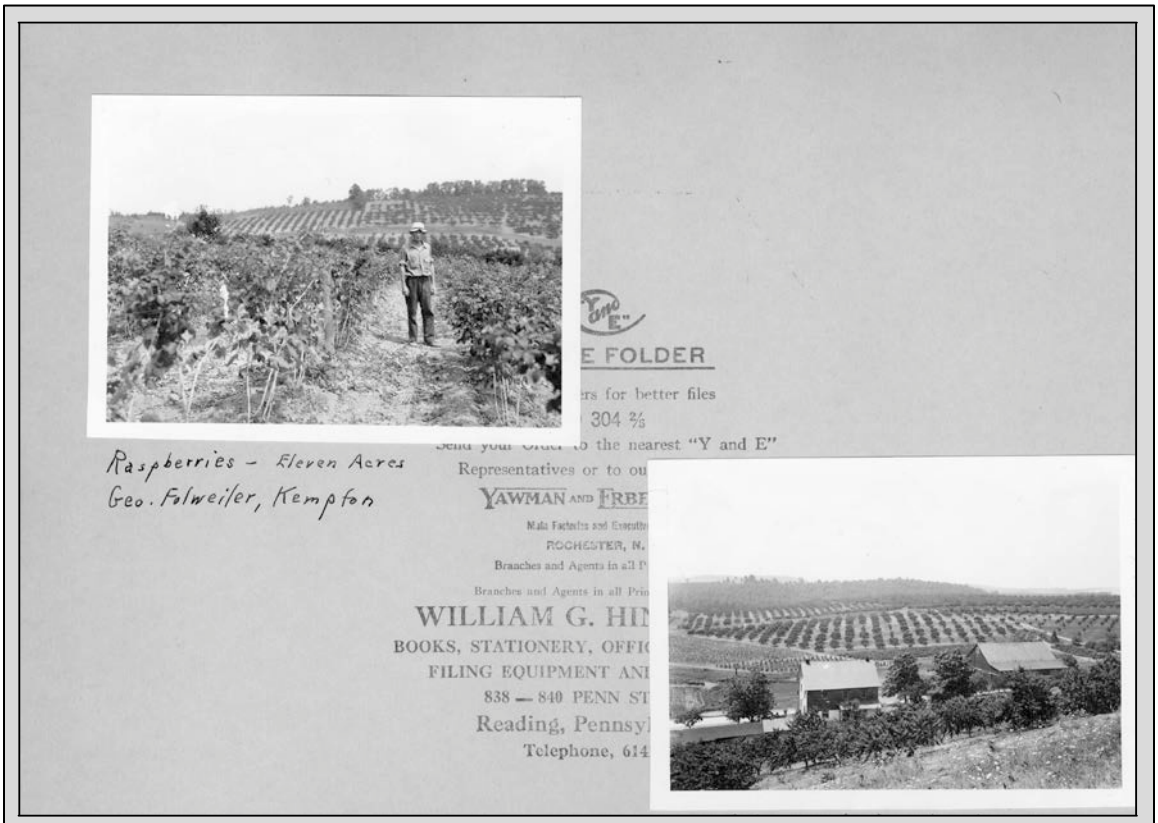
Allées: Two different sites documented in field study featured deliberately planted, equally spaced rows of trees on opposite sides of a farm lane. These "allées" created a distinctive landscape feature.

"Allee" of deciduous trees, Antrim Township, Franklin County, date unknown, but probably about 1940-50. Site 055-AN-008.



"Allee" of deciduous and evergreen trees, Antrim Township, Franklin County, date unknown, but at least some of these trees appear on the 1938 aerial. Site 055-AN-010.

Orchard: Despite the troubles facing fruit growers, orchards were still very common in the early twentieth century. Some sources note that fruit trees were planted along field boundaries and hedgerows. More visible on historic aerials and in the contemporary landscape is the traditional orchard planting of regularly spaced trees.



Orchard planting (lower right), 1939 Berks County agricultural extension report.

Orchard, Guilford Township, Franklin County. The trees are recent, but there have been orchards at the site and in the vicinity since at least 1938. Site 055-GU-003.

Tatamy, Forks Township, Northampton County, PA, 1938 aerial. Large and small orchards are scattered throughout the area, but they are most numerous in the lower right quadrant of the photo.

Field patterns: Pasture and woodlots took up a small percentage of farm land in the Great Valley. Larger scale farm machinery sometimes occasioned the removal of field boundaries and consolidation of smaller fields into a single large one. Crop rotation systems still dictated multiple small polygonal fields, divided by hedgerows, fences, or treelines. Though the agricultural extension agents frequently discussed contour plowing and strip cropping during this period, the aerials show almost no evidence for contour plowing. Neither is there much evidence for strip cropping; though many long, narrow strips appear, they are not repeated. This suggests that they were part of traditional

rotations rather than some systematic plan for strip cropping. Treelines were prominent in the Great Valley as dividing devices between the crazy quilt of open fields.

Farm forestry: the agricultural extension reports of the period for Berks County mention very extensive forest plantings using seedlings provided by the Pennsylvania Department of Forestry. In 1933 the Berks County agent wrote that "The seedlings planted since 1921 "cover about 6,000 of the 25,000 waste acres reported in the census of 1920...This year 97 planters set out about 1/4 of a million seedlings secured from the state." In 1939, he noted that "the state record shows 531,900 seedlings sent to the County this year, of which number 290,000 were planted on farm woodlots, by 108 planters, and 241,900 on water sheds and game reserves, planted by 10 planters." The accumulated impact of these plantings must have been significant, unless drought killed many trees. Possibly these plantings were not in the most level areas of the Great Valley, but they definitely were within the boundaries of Great Valley counties.

Treeline and "sentinel" tree, Montgomery Township, Franklin County. The treeline and lone tree can be clearly seen on the 1938 aerial photo. Site 055-MO-002.

Treeline, Southampton Township, Franklin County. It can be clearly seen on the 1938 aerial photo. Site 55-SO-002.

Sentinel tree, utility line, pasture, corn field, Montgomery Township, Franklin County. Date unknown. Site 055-MO-004.

Utility lines were a new landscape feature in the rural Great Valley.

Fencing: Barbed wire came into use toward the end of the nineteenth century and still can be found in the Great Valley. Fegley's photos show that wood "worm" and board-and-rail fences were still used in the early twentieth century, but these do not remain in the landscape.

Barbed wire fencing, Jackson Township, Lebanon County, date unknown. Site 075-JA-008.

1940-1960: Specialization, Petroleum-Based Production, and Off-Farm Labor

A relentless cost-price squeeze during and after World War II shaped many farming trends. Competition intensified within a global marketplace. Urban sprawl exacerbated stresses on farms. The decline in farm numbers and increase in average farm size both accelerated. Farming rapidly became more capital intensive, large-scale, mechanized, science-driven, petroleum dependent, and specialized. Diversity of production and processes declined. Consumption replaced investment of time and labor for household food production. Off-farm work continued to play an important role in the farm economy.

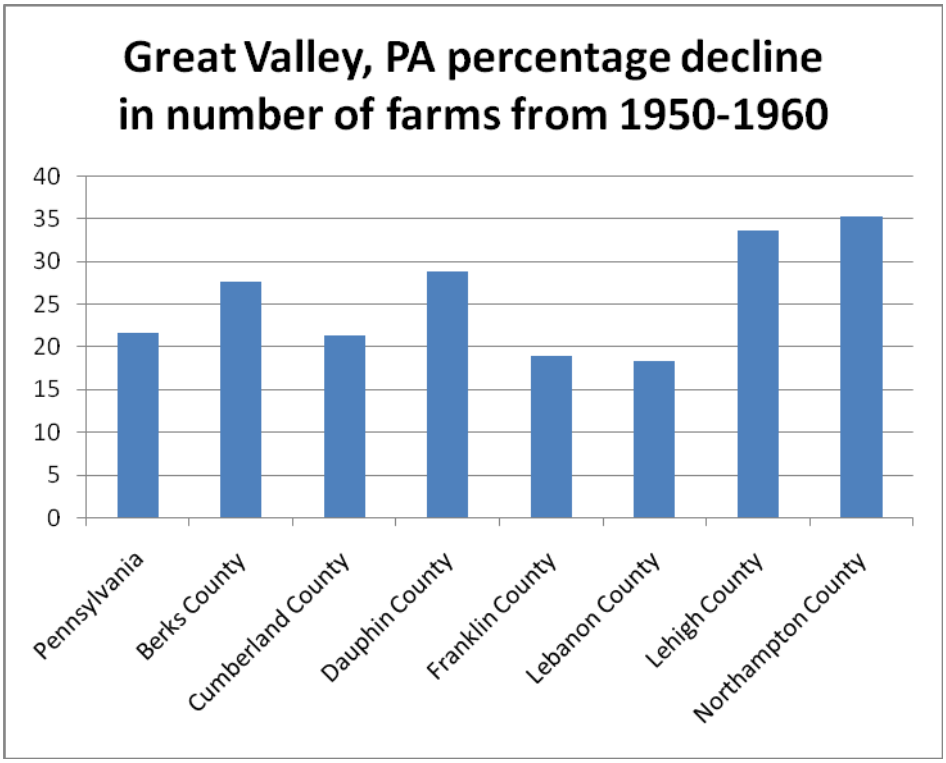
Products, 1940-1960

The Second World War period brought fundamental changes to farming in the Great Valley. The agricultural extension agent annual reports give a picture of the key changes. Capital investments rose rapidly for cattle, feed, equipment, fertilizer, pesticides, sanitation equipment, and labor. Expenses rose as milk companies switched to bulk tanks and sanitation regulations tightened. The Berks County agricultural extension agent wrote in 1959: "Economically the dairy industry in Berks County is the highest source of farm income...Pipe line milkers, loose housing, milking parlors, bulk milk tanks, automatic gutter cleaners, and silo unloaders enable one man to take care of more animals and produce a better quality product than ever before." Purebred livestock, artificial insemination, hybrid crops, and petroleum derived fuel, plastics, fertilizers, and pesticides all boosted productivity, but raised costs. Meanwhile prices for farm commodities did not keep pace. Indeed, with productivity rising so rapidly, surpluses accumulated and prices sometimes even dropped. This cost-price squeeze forced out all but the biggest and best capitalized farms. As the Northampton County agricultural extension agent explained in 1959: "Lower farm prices for farm products has produced a very tight cost squeeze for the farmers. A definite trend toward the operation of larger units either owned or leased is continually underway. This trend necessitates more careful planning and better over-all farm management."[96]

These trends occurred everywhere. Indeed, a hallmark of the post 1940 Great Valley agricultural economy is the extent to which it was so much more shaped by forces beyond the local or regional scale. Of course, farming had never been completely local; after all, Great Valley farmers had been eager to sell on the global market already in colonial days. The change was not in the fact of global impact, but in the proportion and extent of it. The economic environment for mid-twentieth century agriculture challenged the viability of small scale diversified regionally oriented farms. Great Valley fruit and vegetable growers struggled to compete with inexpensive produce trucked in from California and the Pacific Northwest. Dairying was still geographically constrained to some extent, but even so the "milk sheds" were larger than before and milk prices low because of overproduction. Poultry farming faced stiff competition from the rapidly developing Delmarva peninsula and Lancaster County.

In the Great Valley, urban and suburban development exacerbated challenges posed for agriculture. In 1958 the Cumberland County home economics extension agent noted that "Cumberland County is fast moving from a rural county to an urbanized one." The Berks home economics agent lamented that there "Many farming areas are becoming suburban housing developments." The pressure was not as great as in the immediate vicinity of Philadelphia, but it was still perceptible.

All of these factors combined to result in a steady drop in farm numbers. In Berks County, for example, there were 4,337 farms in 1950 and just 3,138 in 1960 – a 28 percent decline in a single decade. Because of their relative isolation, Franklin and Lebanon Counties were less hard hit than the others; suburbanization in the Allentown/Bethlehem/Easton and Reading areas was probably greater. Even Cumberland (despite the home economists's statement) had not yet become suburban Harrisburg.



As farm numbers dwindled, the remaining farms specialized more heavily. The percentage of income from dairy cattle rose during the 1950s, in many cases to over half. This was true throughout the Great Valley. The postwar period witnessed the final dominance of the Holstein cow, perpetuated through artificial insemination. All but the prize bulls were redundant now.

By 1960 poultry farming was a much larger scale business than it had been before, and in most Great Valley counties (for example Northampton) it accounted for the second greatest portion of farm income and (in many individual instances) the top income generator.

Swine production continued in the Great Valley. There seems to have been a geographic differentiation within the valley; in Cumberland, Franklin, and Dauphin Counties in 1960 the average farm had ten or more hogs, while further east the numbers had declined markedly, down to only supplying household needs. Where swine were still produced, it seems that neighbors, local butchers, or farmers' markets were being replaced by packing houses and large-scale auction organizations. For example, the Cumberland county agent noted in 1960 that "the swine industry is on the increase in the county, due to demand of

packers for local fed animals, and due to the feeder pig sales started in the State within the last few years. Increased requests were answered on farrowing house and other swine building construction."

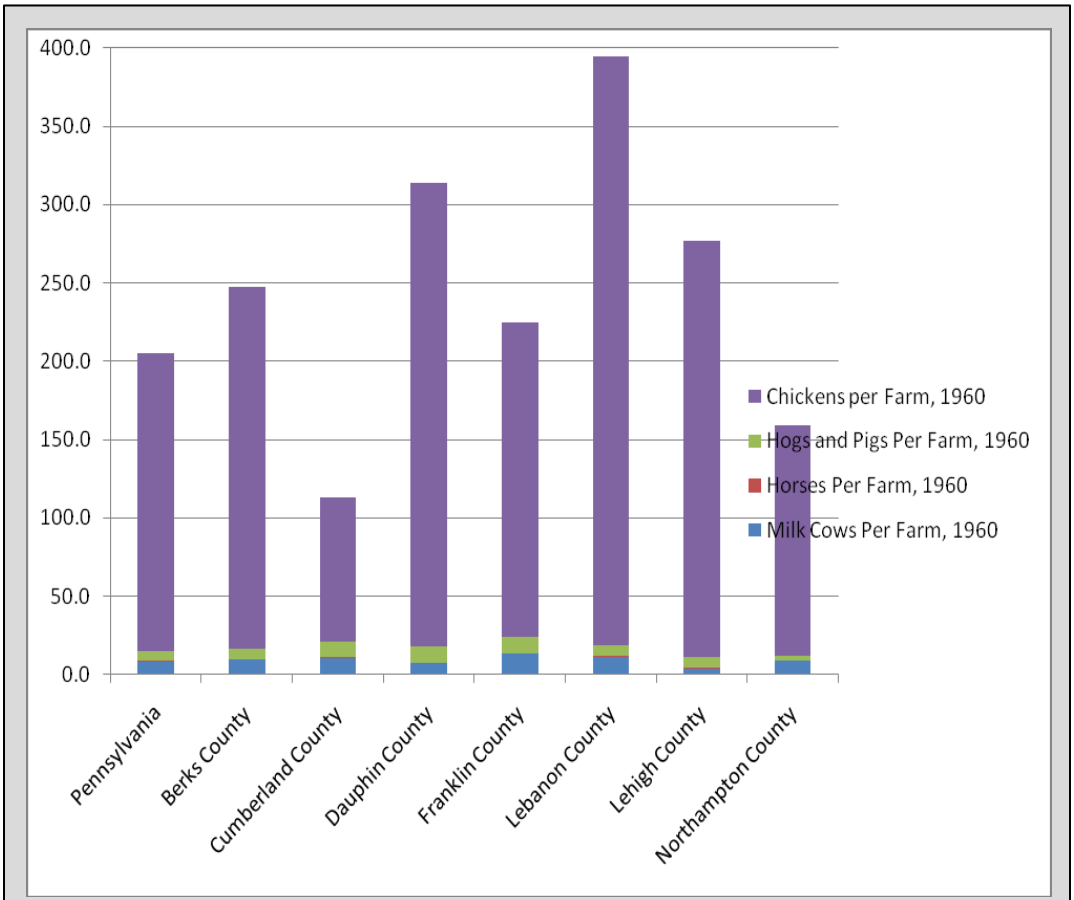
The horse was now disappearing quickly. Even so, many farms still had horses. On average in 1960 most Great Valley counties had between .3 and .6 horses per farm, so it seems reasonable to assume that every second or third farm still had a team.

Crop farming – now mainly wheat, hay, and corn – was still important, especially west of the Susquehanna. Hay and corn were still fed on the farm, mainly to dairy cows. The old crop-and-livestock cycle was fraying, though. Per-farm acreage of wheat, oats, and minor grains had dropped drastically since 1927, while corn and hay increased. More and more feed and fertilizer were being purchased from off the farm.

During a brief period in the Second World War era, cannery crops were intensively produced. However, as the national and global transport grid delivered vegetables from afar, Great Valley truck farmers ironically found it difficult to compete, and by the mid-1950s this activity waned.

Family subsistence activity diminished. Families still kept gardens, butchered, and sold produce in local markets; but purchased food accounted for a higher proportion of the diet. Home canning did not disappear overnight but slowly declined. Freezing home grown foods became popular.

The net effect of these trends was to change the face of farming. It was no less complex than before, but required quite different types of expertise. In place of a broad general knowledge, farm operators needed more technical knowledge about fewer products, and they had to have sophisticated financial skills.



Great Valley Farm Livestock, 1960.

Labor and Land Tenure, 1940-1960

In the Great Valley between 1940 and 1960, the percentage of farms reporting hiring labor fluctuated. Census respondents were asked if they hired labor in the week preceding the enumeration, so seasonal variations would distort the figures on an annual basis. In any case, no more than a third of farms reported hiring labor, so it seems reasonable to conclude that only a minority of farms used hired workers, and that labor was mainly hired on a short-term basis rather than by the year.

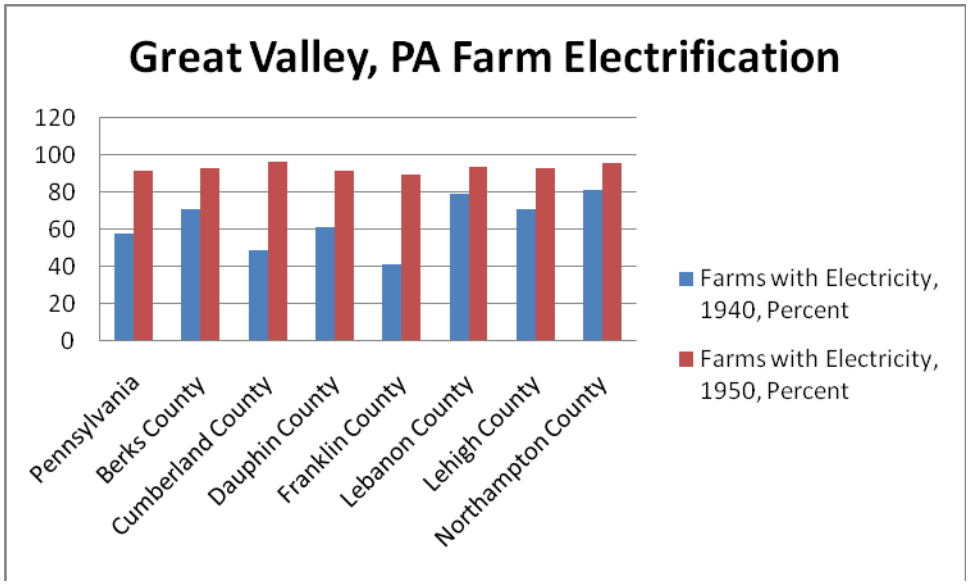
During and immediately after the Second World War, farm labor shortages were acute in the Great Valley. Farm labor needs were filled through improvisation. High school students, Conscientious Objectors, Prisoners of War, "independent migratory workers," migrants from the Bahamas and Jamaica on government-sponsored programs, Puerto

Ricans, and even "vacationists" worked on Great Valley farms. They harvested potatoes, picked fruit, ran farm machinery, and performed other farm chores.

Most work was still done by the farm family. During the war, household labor patterns changed, as teenaged girls filled in for their absent brothers and fathers by driving tractors and operating farm machinery. The Berks County home economics extension agent noted in 1945: "The problems of rural families were quite similar all over the county. A shortage of farm help meant that the farm women and girls were needed to assist with outside work in the field and barn. Nearly all the farm family vegetable plots are part of the homemakers' responsibilities but with the shortage of labor, more women assumed the jobs in connection with: 1. Raising Poultry 2. Caring for the Dairy Herds. This meant longer hours outside the home and less time for the usual tasks of homemaking."

An important aspect of the rural economy during this period was off-farm labor by farm operators. Between 1940 and 1960 the percentage of farm operators who reported working off the farm fluctuated quite a bit, from around a third to as much as half. Some of the swings may be attributed to changes in information-collecting; in 1960 sampling techniques may have been skewed toward larger-scale commercial farms. This would under-report for the very farms on which off-farm labor was most crucial. As well, it is important to note that the statistics may underestimate the impact of off-farm labor because they tally employment by farm *operators*, and usually this meant the male household head. Yet, women's employment was increasing during the postwar years and ultimately would come to play a big role in supporting farm household income. For example, in 1952 the Cumberland County home economics extension agent noted extensive off-farm labor by women in her constituency. The Berks County home economics extension agent noted in her 1956 report that "Small knitting mills, shirt factories, etc. have sprung up and both rural and farm women have gone to work. It is not unusual for a farm woman to work the 6 to 2 shift, then go home and do her housework and help with the farm chores." No quantitative data on farm women's off-farm labor were available until much later.

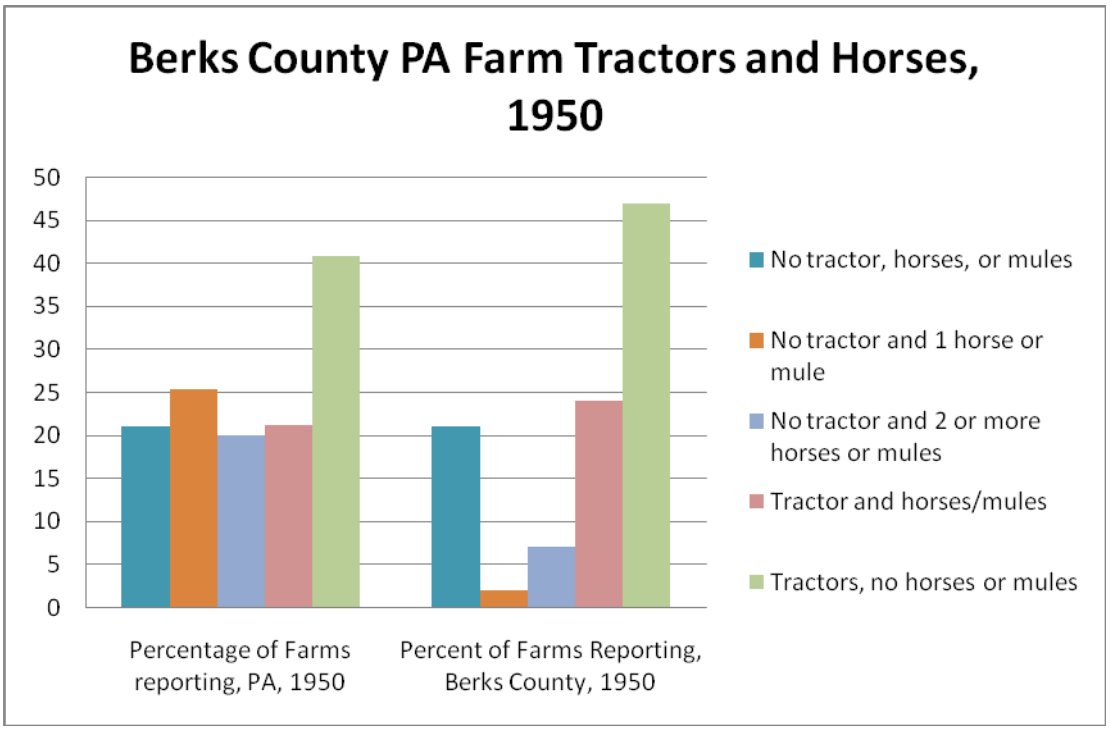
All in all, there was an unmistakable trend for households to supplement farm income with off-farm employment. Off-farm labor continued a longstanding tradition of combining farming with other income-generating activities; commuting and working for wages differentiated it from earlier artisan or trading activity.



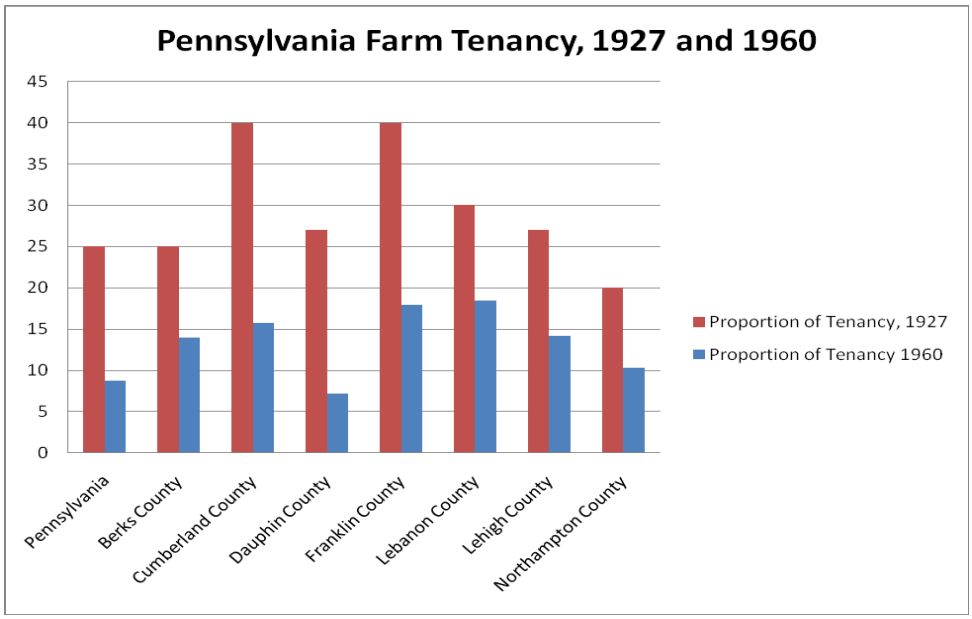
Labor-saving technologies were much more common than before 1940. Electrification approached one hundred percent. Indoor plumbing, home freezers, and other appliances became much more common. Scholars have debated the relationship of farm women to the new technologies. Katherine Jellison, for example, has argued that farm women resisted the agricultural establishment's attempts to promote an urban middle-class gender model.[97] Others have argued that "domestic" technology created labor rather than saving it. On a raw, day to day level, though, basic amenities like running water and electric lighting indisputably saved both time and physical effort for all rural household members.

The fossil-fuel revolution was now in full swing. Numerous new farm machines rapidly reduced the need for human or animal muscle power. Even so, adoption was uneven. The chart below shows 1950 patterns in one county – Berks, the Great Valley county with the largest number of farms. Notably, a fifth of farms lacked either tractors *or* horses. Presumably these were mostly small or part-time operations. Berks County farms were more highly mechanized than in the state as a whole; over 45 percent had

dispensed altogether with draft animals. Yet another 25 percent combined tractor power with animal power. In a telling move, though, by 1960 the agricultural census no longer linked questions about horse numbers with tallies of tractors.



Farm tenure patterns had changed significantly. Tenancy rates had fallen from previous highs, both in the Great Valley and throughout the state. Likely the general drop in tenancy was because the "agricultural ladder" – the series of steps from farm hand to tenant to owner – had broken down. Thus a decline in tenancy is not necessarily a positive sign; it means that one means of access to land was closed off.[98] In the Great Valley, another factor may have been that the traditional system of kinship-based share tenancy did not work well with increased capital requirements and a shift away from reliance on crops.



Buildings and landscapes, 1940-1960

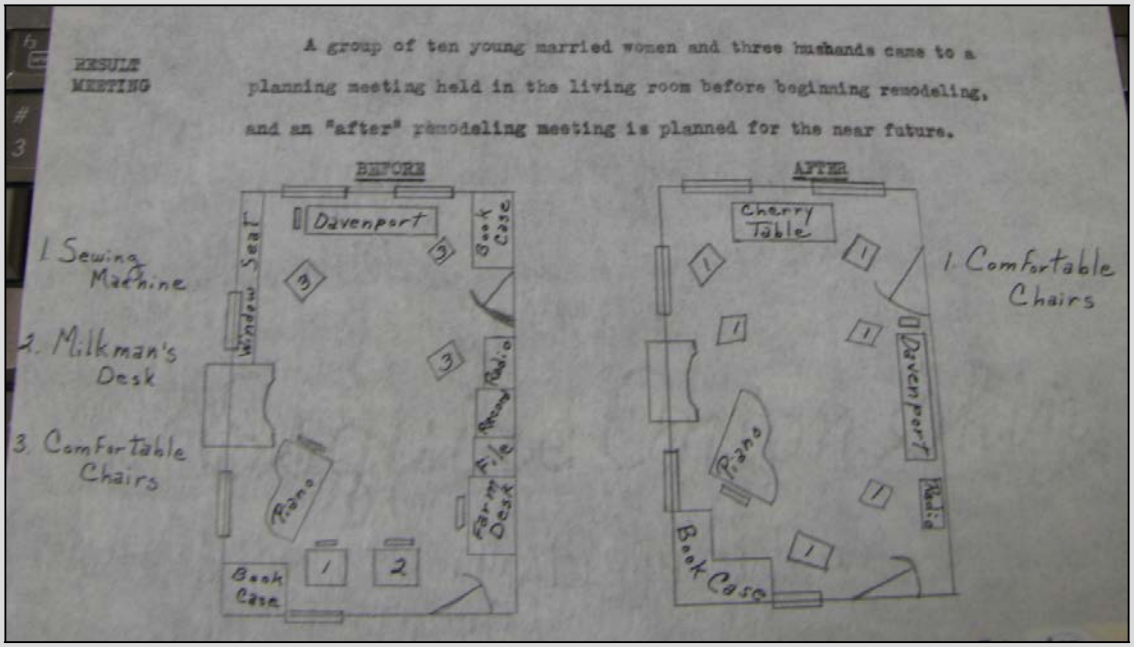
Houses, 1940-1960

Few new farm houses built during this period were documented in field study.[99] After building supply shortages eased, home economics extension specialists chronicled a wave of renovation activities. In 1944, for example, the agent in Northampton reported that "Four result kitchens have been carried on during the past year, three of which are completed and the fourth in the process of completion. Mrs. Vernon Hester made plans for remodeling her kitchen in 1948. Because at that time the money was needed for other purposes, the kitchen plans were shelved. Again this year Mrs. Hester began working on plans for her kitchen and carried through. Improvements included hot and cold water in the kitchen, sink, new cupboards, new gas stove, new linoleum, heating unit, a lavatory, and improved lighting at work centers." A Mrs. Whitaker installed an electric stove, moved her refrigerator from dining room to kitchen, and put down new linoleum. Mrs. Weidman at Stone Church got a new sink, new counter space, and rewiring for electricity. Painters from town painting the house said "Your kitchen is nicer than they have in towns."[100] Extension specialists worked with these projects, but probably many other similar ones were being undertaken.

The Northampton home economics report for 1945 contained valuable information about rural housing. It is not clear whether these conditions were typical, but the results are

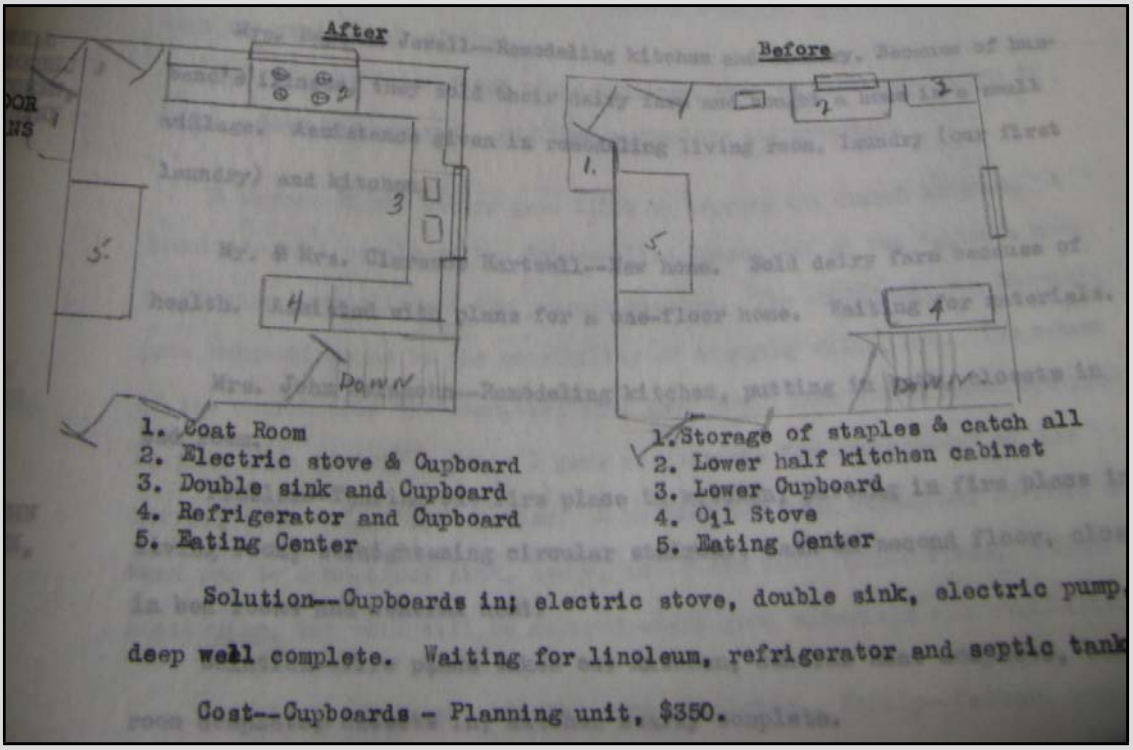
notable nonetheless, because even at this late date a survey in a fairly prosperous Great Valley township showed that many families still cooked and heated with wood, and some even lacked hot running water.

A summary of the 25 kitchens [surveyed in Mt Bethel] shows that the average family…consists of four people living in six rooms. The average kitchen has three windows and four doors. Seventeen families have built-in cabinets in their kitchens, 18 have electric refrigerators. Fifteen homemakers work on kitchen tables while 9 on cabinets. Eight women cook with coal, one with oil, three with bottle gas, while six use electricity. The rest use combinations of wood and coal. The families are evenly divided on kitchens and dining rooms. Twelve have kitchens and dining rooms together, while 13 use separate rooms. Only four homemakers take care of milk equipment in the kitchen. The other 20 have special milk houses. Only nine families do the family wash in the kitchen, the remaining 15 have laundry rooms. Twelve women can sit when they work because they have kitchen stools. The nine others do not have stools. There is lots of carrying of wood and ashes because 13 use stoves only, while 12 have a furnace. In most of the homes, the water does the running because 19 have running water under pressure and 5 have pitcher pumps at the sink, while 24 have kitchen sinks. Fifteen get their water from a drilled well and have a good supply while nine have cisterns and must use water carefully during dry spells. Running hot water is a joy in16 homes. Nineteen families' homes are lighted with electric from the power plant. Five use gasoline and kerosene, while one uses kerosene.[101]



Above: Living room designs, 1945. Note that the "after" (approved) design has eliminated the farm record center and desk, and the milkman's desk, thus removing "farm" and finance-related spaces and making the room more "domestic."

Below: Kitchen designs, 1949. Modern appliances and counter spaces are new, but the "eating center" remained.



Farm kitchen photo, Northampton County home economics extension report, 1949.

In Lebanon County, the percentages weren't too different; 95 percent had electricity, just over half had telephones, 70 percent had running water, and only 60 percent had bathrooms.[102]

Barns, 1940-1960

Adaptations to earlier Pennsylvania forebay bank barns continued in this period. Poultry adaptations continued to be made. Typical dairy modifications include cementing floors; substituting metal stanchions in lengthwise rows for crosswise wooden stalls; separating pigs, horses, and cows more carefully; installing rows of windows in the basement wall; and installing ventilation systems. In Dauphin County, for example, the 1950 agricultural extension agent report mentioned creating “maternity stalls” in barns, to prevent spread of infection to newborns. Some were installed where bulls used to be, now that artificial insemination rendered them redundant.

In surveyed properties, the most common barn built new in this period was the stable barn. A stable barn is a type of twentieth century barn whose essential characteristics consist of ground-level stabling, usually in the form of stanchions for dairy cattle, accessed by a gable end opening and separated by a lengthwise aisle, and served by ample hay upper-level storage space created by a round or "Gothic" roof, or a gambrel roof. The barns are well-lighted with rows of windows along each eaves side. Usually they are built with twentieth century materials; rock face concrete block, cement block, and wood balloon framing are especially common. The original flooring is usually concrete as well. They were popularized through the national agricultural press, agricultural extension publications, and even commercial catalogues from companies like Sears, Roebuck and the James Manufacturing Company in Wisconsin. These barns, notably the bigger examples, reflect large scale dairy production, and a break from traditional forms and materials. The larger examples accommodated not only bigger herds, but larger Holstein cows and the huge amounts of feed they required. The twentieth century stable barn also represent a response to stepped-up state regulation of the dairy industry, which mandated (among other things) ample light, easily cleaned surfaces, no manure basement, and ventilation for dairy cows.

Stable barns made their initial appearance in the early twentieth century, but documented examples in the Great Valley tend to date after 1940. As elsewhere, the stable barn in the Great Valley reflects greater specialization in dairying, new construction technologies and building materials, and state regulation.

Pennsylvania barn transformed into a gambrel-roof stable barn, South Annville Township, Lebanon County. Original construction probably c. 1850; modified in the mid-twentieth century. Site 075-SA-002.

Stable barn, Lurgan Township, Franklin County, c. 1950. Site 055-LU-001.

Interior framing, barn at site 055-LU-001. Note the light, short members and lack of posts.

Stable barn, Straban Township, Franklin County, mid- to late twentieth century barn built on earlier stone foundation. This barn retains the barnyard wall characteristic of the Pennsylvania forebay barn, only it is built of concrrete block and metal pipe. Site 055-ST-003.

Another type to appear after World War II was the freestall barn. Research at the University of Wisconsin in the early 1950s showed that cattle actually did better in these open, light structures than when they were confined in conventional stanchion arrangements. Newer free stall barns in the Great Valley are independent structures, often metal, which date after 1960, but a few free stall additions were made to existing barns. They tend to be simple, open shed roof pole-built structures, usually placed on the forebay side.

Pennsylvania Sweitzer barn with shed-roof freestall addition, Antrim Township, Franklin County. Original barn c. 1875, addition mid-twentieth century. Site 055-AN-001.

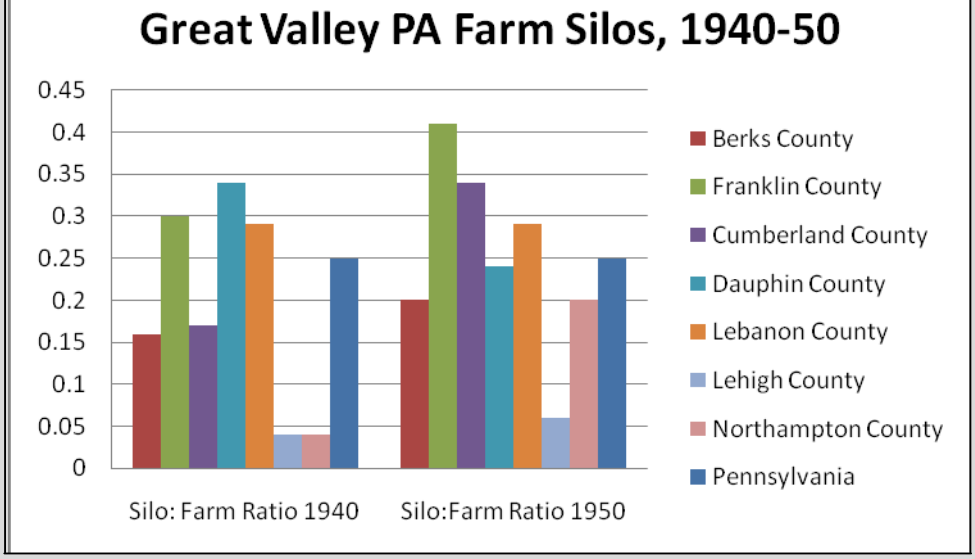
Pennsylvania barn with shed-roof loafing area addition and rainbow-roof stable barn addition, Mill Creek Township, Lebanon County, nineteenth century original with mid-twentieth century modifications. Site 075-MC-006.

In the mid-twentieth century tobacco growing came to parts of Lebanon County. Tobacco barns in Lebanon County are later than those in Lancaster County because of this timing. Though the materials were contemporary (narrow vertical board, balloon framing, concrete-block foundations, metal cased windows, etc.), the form kept to nineteenth century precedents. That is, these were banked buildings with the signature slatted siding. Inside there were tiers of lath in the upper level where tobacco was hung, and a basement level where stripping and packing occurred.

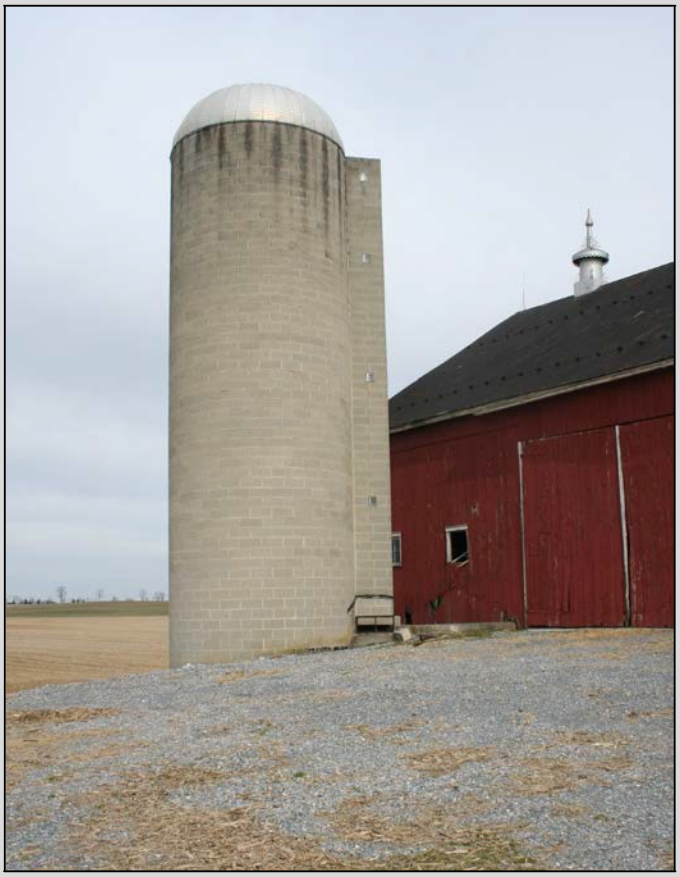
Tobacco barn, Jackson Township, Lebanon County, c. 1960. Site 075-JA-008.

Silos, 1940-1960

As dairying became more important in the Great Valley, more silos appeared. Concrete-stave and poured-concrete silos were the most common types in this period. The agricultural extension reports mention trench silos, but the census data show that these were uncommon.



These data are predictable except for the Dauphin County figures.



Concrete block silo, Peters Township, Franklin County, mid-twentieth century. Site 055-PE-003.

Three types of silo: from left to right, concrete stave, poured concrete, concrete stave, and Harvestore. The concrete stave silos are probably mid-twentieth century and the others more recent. Mill Creek Township, Lebanon County. Site 075-MC-006.

Milk Houses, 1940-1960

With more dairying came more milk houses. Milk houses are difficult to date; mid-twentieth century ones probably tend to be built of concrete block and are a little larger than earlier ones.

Milk house, South Annville Township, Lebanon County, mid-twentieth century. Site 075-SA-001.

Milking Parlors, 1940-1960

With the new freestall animal shelter practices, a separate milking parlor was often used. The cows stayed in their freestall area and at milking time they walked to the milking parlor in groups, then returned to the stalls. Milking parlors tend to be small, one-story buildings sited near the barn, equipped with 8 to 12 milking stations.

Milking parlor, Peters Township, Franklin County, mid-twentieth century. Site 055-PE-002.

Machine Sheds, 1940-1960

New machine sheds continued to be built in this era of expansion. They tended to be larger than prewar ones, and to be built of concrete block or pole construction oftener than frame.

Machine Shed, North Cornwall Township, Lebanon County, mid-twentieth century. Site 075-NC-002.

Poultry Houses, 1940-1960

In keeping with its greater role in the farming economy, the postwar poultry house was bigger than its predecessor. Often poultry houses from this period would be more than one story. As before, barns were adapted for poultry; one Dauphin County farmer renovated his bank barn in 1947 to house 4,000 birds. [103]

Poultry house, Guilford Township, Franklin County, mid-twentieth century. It was later adapted for a garage. Site 055-GU-003.

Poultry house, Montgomery Township, Franklin County, mid-twentieth century. Site 055-MO-005.

Poultry house, Jackson Township, Lebanon County, mid-twentieth century. The building has since been turned into a workshop. Site 075-JA-005.

Pigsties, 1940-1960

Since swine continued in a modestly important role in the Great Valley, new pigsties continued to be built. Their form, proportions, and size was not too different from those of earlier pigsties, but they can be distinguished by materials: narrow or beaded board; balloon framing; concrete foundations.

Pigsty, Antrim Township, Franklin County, c. 1950. Site 055-AN-010.

Garages, 1940-1960

Garages and machine sheds are difficult to differentiate, but garages probably tend to be built of more durable materials, and to be enclosed on all sides; machine sheds are often open on one or more sides.

Garage, Guilford Township, Franklin County, mid-twentieth century. Site 055-GU-003.

Landscape Features, 1940-1960

Contour plowing and strip cropping were widely instituted during this period. The two aerial photos from Franklin County show the changes especially clearly. In some areas (for instance the crop strips on the right of the 1957 photo) fields were consolidated and treelines eliminated, probably to accommodate larger machinery. However, many features from 1937 remain in 1957, including orchards, crop fields, treelines, and woodlots.

Ponds were much mentioned in the agricultural extension reports after the war. The Northampton County extension agent, for example, claimed that 200 farm ponds were built in 1955 alone. The pond boom was attributed to the availability of heavy excavating equipment; insurance price discounts for farms with ponds; new interest in recreation; and the need for water to irrigate, especially cannery and truck crops. Water for mixing sprays was also needed.

Dynamited ditches for drainage were mentioned in the agricultural extension reports, but it is not clear that these were created in any great numbers. The blasting spectacle drew crowds.

Crop fields, pasture, woodlot, and hay land were still the main farm land uses.

Concern began to rise about loss of farmland during this period. Suburban development begins to appear on period aerials in some places.

Northwest of Waynesboro, Franklin County, 1937

Northwest of Waynesboro, Franklin County, 1957.

Property Types and Registration Requirements – Criterion A, Pennsylvania

This statement outlines considerations for Pennsylvania as a whole.

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 s 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.[104]

Issues of Chronology

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

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

-OR-

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

How to Measure a Property in its Regional Context

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

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

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

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

3a) levels of mechanization: in highly mechanized areas (relative to the state levels) we would normally expect an array of machine sheds, machinery bays integrally placed in barns, horse-power extensions, etc.[105] Conversely, in low-mechanization areas such as the Northern Tier, these facilities will likely be less visible.

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

patterns of labor organization should be assessed for significance (with respect to agriculture) based on the level of clarity, intensity, and chronological consistency with which they show labor patterns. For example, if a c. 1850 farm house has a c.1880 workers' wing with back stair and no access to the family living area, that is both a clear and chronologically consistent illustration of shifts in hired labor's status.

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

3 c) Tenancy: This aspect of social organization will be reflected most in historic agricultural districts (rather than on farmsteads or farms). A historic agricultural district should reflect prevalent levels of tenancy for its region. So, we would expect to see fewer documented tenant properties in Northern Tier districts than in a Central Limestone valleys district. Where individual farms or farmsteads are concerned, a farm or farmstead with a documented history of tenancy are significant for tenancy, but only in regions where tenancy rates were historically higher than the state average.

Cultural Patterns

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

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

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

Property Types and Registration Requirements — Criterion A, Agriculture: Registration Requirements for the Great Valley Historic Agricultural Region

Substantive Guidelines:

To be considered significant for the period of "Diversified small-scale farming and wheat for export: Mid-eighteenth to early nineteenth century," a farmstead should include, at a minimum, a farmhouse typical of extant buildings for the region, dating to the period; and at least one outbuilding related to diverse production dating to the period. A farm should have remnant crop fields or woodlot. It is a plus if historic field or property boundary lines are represented. A historic agricultural district would need a group of contiguous farms collectively representing these features.

To be considered significant for the period of "Diversified grain-and-livestock farming: early nineteenth century to c. 1900," a farmstead should have a farm house typical of the period and place, or an older house showing period modifications; a barn typical of the period; and at least one smaller outbuilding typical of the period—summer kitchen, springhouse, smokehouse, bake house, pigsty, machine shed, etc. The more outbuildings there are which illustrate agricultural diversification, the better. A farm should have crop land and retain at least some historic field size or boundary. A historic agricultural district should have a more or less contiguous collection of farms collectively representing these features.

To be considered significant for the period of "Diversified Crops, Livestock, and Poultry, c. 1900-1940," a farmstead should include a house typical of the time and place or an older house showing period modifications; an older barn showing twentieth century adaptations; at least one summer kitchen, smoke house, or butcher house; at least one outbuilding showing poultry raising, hog raising, or dairying; and architectural accommodation for farm machinery. The more outbuildings there are which illustrate agricultural diversification, the better. A farm should have cropland.

Remnant field boundaries such as treelines or fencing are a plus. Landscape evidence for truck farming or orcharding is a plus because of its rarity. A historic agricultural district would need a group of contiguous farms collectively representing these features.

To be considered significant for the period of "Specialization, Petroleum Based Production, and Off-Farm Labor, 1940-1960," a farmstead need not have a house which dates precisely from this period, but should have barn dating from the period or a barn with adaptations dating from the period; architectural evidence for dairying and/or poultry raising; and architectural accommodation for farm machinery. A farm should have cropland. Remnant field boundaries such as treelines or fencing are a plus, as is a farm pond. Historic contour strips are a plus. A historic agricultural district would need a group of contiguous farms collectively representing these features.

To be considered significant for representing the major agricultural changes in the Great Valley Historic Agricultural Region, a farmstead should have architectural evidence of the major shifts over time. For example, an early nineteenth century house, late nineteenth century barn and subsistence buildings, and twentieth century silo, milk house, and barn adaptations would effectively portray the shift from diversified strategies to dairying. A farm should have cropland and some remnant landscape features such as woodlot, pond, or treelines. A historic agricultural district should have a more or less contiguous collection of farms representing these features.

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

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

Typical examples are encouraged to satisfy Criterion A for agriculture, but average or ordinary examples are not likely to qualify under Criterion C for Design and Construction. A farm or farmstead will not be eligible under Criterion C simply because it has farm buildings that retain integrity. Under Criterion C, to be eligible as property must exhibit the "distinctive characteristics of a type, period, or method of construction or that represent the work of a master, of that possess high artistic values, or, as a rural

historic district, that represent a significant and distinguishable entity whose components lack individual distinction".[106]

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 ...".[107] 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.[108] 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-nineteenth century vernacular farmhouse that was Colonial Revivalized in the early twentieth century might be significant for its stylistic features outside this MPDF but would not be architecturally significant under this MPDF because the alterations are not associated with the needs and priorities of farm life. But a farmhouse modified to reflect important transitions in the relationships of farm family members to each other, labor, or the market could be considered significant (such as the addition or removal of quarters for hired hands, cooking facilities for feeding threshing crews, social spaces separated from spaces devoted farm matters, etc). Changes reflecting access to modern amenities and willingness to adopt modern amenities could also be considered significant, such as the addition of a bathroom, running water, a heating plant, or electrification. However, the design features reflecting these changes must be demonstrated to be part of a local or regional pattern of construction; individual, personalized or idiosyncratic alterations that lack design features not adopted elsewhere in the community would not be considered significant under Criterion C, but would support significance under Criterion A for their association with labor and production patterns. In the post-World War 2 era, many farmhouses have undergone dramatic changes in ways that make them indistinguishable from contemporary suburban residences in their materials, styles, amenities, and use. Thus it will be difficult to evaluate the Criterion C significance of post war farmhouses without further study.

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

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

Design also includes overall layout of the farmstead or farm, for instance if buildings are arranged in a recognized, regionally typical pattern in orientation and layout, such as linear organization of eastern and central Pennsylvania (as described by Henry Glassie, Joseph

Glass, and others); or; farmsteads bisected by a road as is common in the Northern Tier (as described by Trewartha).

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

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

Examples

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

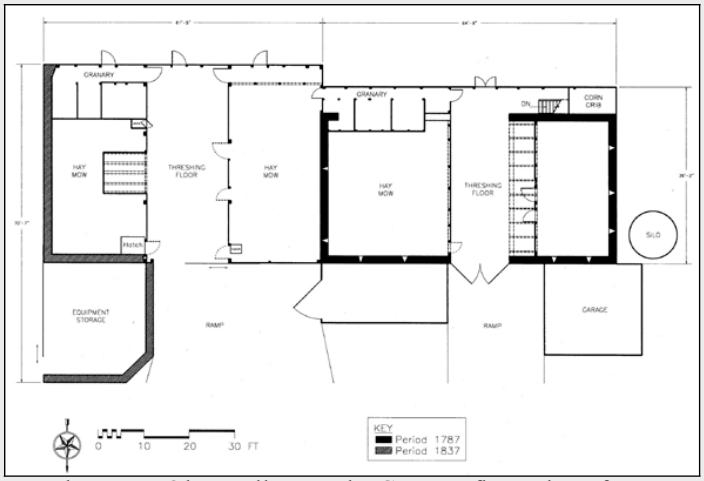
Ornament on Hodge Barn, Centre County

Hodge Barn, Centre County, struts under forebay

Hodge Barn, Centre County, struts under forebay

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

Bertolet Barn, Oley Valley, 1787 and 1839.



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

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


Plank Barn, Cumberland County, 1853

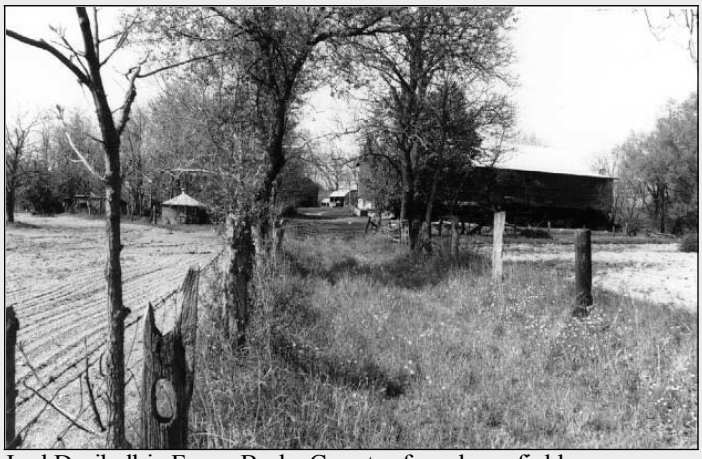
Example 4. Smokehouse, Tulpehocken Manor, Lebanon County, late eighteenth century. Most examples of architectural significance will likely be larger buildings such as barns, but this smokehouse (in Lebanon County) is an example of a smaller building which might qualify because of its masonry (which qualifies 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 eighteenth 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 twentieth 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

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

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

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

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

Change Over Time

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

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

Agricultural Production

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

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

Labor and Land Tenure

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

Aside from providing important information on individual farms and individual ownership, archaeology can provide important information on the effects of larger events

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

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

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

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

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

Cultural Patterns

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

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

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

Faunal Studies

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

Conclusion

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

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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.

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."[109]

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."[110]

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 sigificance, but if its entire lower level was gutted, expanded, cemented, with new partitions in the 1980s, it would likely not retain integrity.
Farmstead layout and the relationship of buildings to topography are important elements in Integrity of Design. Farm layout should retain integrity with respect to farm labor patterns for the period of significance in the region where the farmstead is located. In most cases, this means spatial organization to facilitate family and neighborhood labor. So, for most pre-1930 farms, a poultry house, detached dairy house, or hog facility should show a siting relationship to both house and barn, usually being situated between house and barn, or in a clear relationship to the house's dooryard (as in the Yankee Northern Tier) or *vorhof* (more common in German Pennsylvania), or in an arrangement where all buildings are closely clustered. Integrity of farmstead design also can apply to characteristic cultural or regional patterns. In the Northern Tier, for example, it was common for a road to bisect the farmstead, whereas in German Pennsylvania, a linear or court-yard organization was more prevalent.

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

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

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

A historic agricultural district retains Integrity of Design when its consituent 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"[111] 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."[112] 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."[113] 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.

Notes

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25. Pendleton, *Oley Valley Heritage*, 97.
26. John P. Miller, *The Lehigh Canal: A Thumb Nail History, 1829-1931* (Allentown, PA: Jiffy Printing, 1979); Philip Klein and Ari Hoogenboom, *A History of Pennsylvania* (University Park, PA, 1973), 205-209; Ann Bartholomew, "Agriculture in Lehigh County to 1920," 81, notes that wheat began to be sold to Allentown dealers and consumed there, in the coal regions, and sent to Philadelphia.
27. "Letter 2," *The Farmer and Gardener*, August 4, 1835. American Periodicals Series Online. Of course, this type of farming wasn't "new" in a general sense. Europeans had long practiced variations on it. Moreover, it is not clear if the manuring and rotations actually resulted in higher per-acre crop yields. Clearing proceeded continually, thus adding acreage to the total under cultivation. Even though crop totals rose drastically, agricultural economist Kuan-I Chen demonstrated that increases were mainly due to added acreage under cultivation between about 1840 and 1880, possibly even to the end of the century. Kuan-I Chen, "Agricultural Production in Pennsylvania, 1840 to 1950," PhD thesis, PSU ag economics/rural sociology, 1954. See also Steven Stoll, *Larding the Lean Earth* (New York, 2002.) A critic writing to the *Maine Farmer* in 1864 ("Drain," *Maine Farmer,* September 1, 1864, American Periodicals Series) thought that Lehigh County farms were poorly managed and fertilized.
28. For a detailed description of crop rotation practices in Berks County, see the letter from Benjamin Saylor of Lower Heidelberg Township in the United States Patent Office Reports, Agriculture, 1852, 224-226. In Dauphin, see United States Patent Office Reports, Agriculture, 1851, 253-255.
29. Francis Coleman Rosenberger, ed. *The Cumberland Valley of Pennsylvania in the 1860s: Proceedings of the Rose Hill Seminar.* Gettysburg, PA: Times and News Publishing Company, 1963, 66.
30. Eli Bowen, *Pictorial Sketch-Book of Pennsylvania* (Philadelphia, 1854), 32.
31. William Woys Weaver, *Sauerkraut Yankees* (Mechanicsburg, PA, 2002), 22.
32. James F. Lambert and Henry J. Reinhard, *A History of Catasauqua in Lehigh County, Pennsylvania* (Allentown, PA, 1914), 360-361.
33. Rupp, I. Daniel. *The History and Topography of Dauphin, Cumberland, Franklin, Bedford, Adams, and Perry Counties*. (Lancaster City, PA, 1846), 367-369.
34. Franklin Ellis, *History of Northampton County, Pennsylvania* (Philadelphia, 1877): 220.
35. *Northampton Journal*, February 9, 1859.
36. United States Patent Office Annual Report, Agriculture, 1848, page 676.

37. Don Yoder, " The Sausage Culture of the Pennsylvania Germans," in Alexander Fenton and Trefor M. Owen, eds., Food in perspective : proceedings of the Third International Conference on Ethnological Food Research, Cardiff, Wales, 1977 (Edinburgh, 1981)**,** 409; on apple buttering, see Bowen, *Pictorial Sketch*, 35.
38. "Memories of Market Square and its Inhabitants, in the Decade from 1840 to 1850" [read before the Dauphin County Historical Society, by Theodore B. Klein], in Notes and Queries: Historical, Biographical, and Genealogical, Relating Chiefly to Interior Pennsylvania. (28-29). Annual Volume 1899. Edited by William Henry Egle. Harrisburg: Harrisburg Publishing Company. 1900.
39. Charles E. Walmer, "Farmers Markets of Harrisburg, Pennsylvania, Their Origin and History, read at a meeting of the Society on November 15, 1943." *Dauphin County Historical Review* 1956: 29-36. See also Cook, *Brief Summer Rambles*, 181, on Reading markets.
40. Jonas Gudehus, "Journey to America," 303, describes the apple butter making process. For photographs of various processes, see Fegley, *Farming, Always Farming*, especially pages 190 and 193.
41. Daniel Rupp, *History of Berks and Lebanon Counties,* (Lancaster: G. Hills, 1844), 264.
42. William Henry Egle, ed., Centenary Memorial of the Erection of the County of Dauphin and the Founding of the City of Harrisburg, 1875-1885. (Harrisburg,1886), 148-50.
43. Tenancy data are from the United States Census of Agriculture. Published summaries are now available online at http://www.agcensus.usda.gov/Publications/Historical_Publications/index.asp.
44. William Henry Egle, *History of the Counties of Dauphin and Lebanon in the Commonwealth of Pennsylvania: Biographical and Genealogical* (Philadelphia, 1883), 167, mentions that the Colemans' estate was 22,000 acres and most of it was cultivated.
45. *Report of the Transactions of the Pennsylvania State Agricultural Society*, 1883, 142.
46. Fegley, *Farming, Always Farming*, 163-7
47. Jonas Gudehus, "Journey to America," 304.
48. Sally McMurry, "The Pennsylvania Barn as a Collective Resource," *Buildings and Landscapes* 16: 1(Spring 2009), 9-29.
49. Joseph Glass, *The Pennsylvania Culture Region: A View from the Barn* (Ann Arbor, Mi: UMI Research Press, 1986). Photographs by H. Winslow Fegley, in *Farming, Always Farming,* show the range very well. See especially pages 4, 5, 35, 36, 38, 39, 40, 91, 93, 98, 99. See also Glassie, *Pattern…*, 56-60.
50. This was not an exclusively Pennsylvania German practice, but it was common in the Pennsylvania culture area. See for example the Matthias Krall house, in Van Dolsen, *Cumberland County*, 38-9.
51. Nancy Van Dolsen, "The Brick-Cased Log Houses of Cumberland County, Pennsylvania," *Perspectives in Vernacular Architecture*, Vol. 3, (1989), 99-107.
52. Rupp, I. D. *History of the counties of Berks and Labanon*. Lancaster, PA, 1844, 263. (catalog record contains this misspelling of "Lebanon")
53. In Franklin County, site MO 001 documents two related farmsteads and site WA 003 has a tenant house.

54. Joel Cook, *Brief Summer Rambles Near Philadelphia.* Philadelphia, 1882, 179.
55. Levi Huber, "Two Hundred Years of Farming in Lancaster County," *Journal of the Lancaster County Historical Society* 34 (1930), 99. See also *New England Farmer* September 25, 1829 page 80 (American Periodicals Series online).
56. *Franklin Repository,* September 20, 1865. Online through Pennsylvania Civil War Newspapers collection.
57. Cook, *Brief Summer Rambles*, 181.
58. For further analysis, see Gabrielle Lanier, "Landscapes," in Sally McMurry and Nancy van Dolsen, eds., *Architecture and Landscape of the Pennsylvania Germans, 1720-1920* (Philadelphia, 2011).
59. Email communication with Cecilia Rusnak, Associate Professor of Landscape Architecture, PSU, April 14, 2009.
60. Charles Shaw et al, "Reconnoissance [sic] Soil Survey of Southeastern Pennsylvania, 1912: p 250, notes a 46% population increase in Allentown between 1900 and 1910.
61. The only county in the region where both farm numbers and farm size decreased between 1910 and 1940 was Cumberland.
62. See also A. C. Berger, "Agricultural Production and Marketing in Lebanon County, Pennsylvania," Pennsylvania Agricultural Experiment Station Bulletin # 198 (September, 1925), Table 4.
63. Berger, "Agricultural Production and Marketing in Lebanon County," 29-32; Anne C. Friedmann, "Reading, Pretzel Capital of the World," *The Historical Review of Berks County* 13 (1948) :72-75.
64. George Fiske Johnson, "Agriculture in Pennsylvania: A Study of Trends, County and State, Since 1840." Pennsylvania Department of Agriculture General Bulletin # 484, November 1, 1929, 23.
65. Berger, "Agricultural Production and Marketing in Lebanon County," 37.
66. Chen, "Agricultural Production in Pennsylvania, 1840 to 1950," 160; Cumberland County Agricultural Extension Archives, County Agent Report, 1919 and following years.
67. Berks County Agricultural Extension Archives, County Agent Report, 1916 and 1934.
68. Berger, "Agricultural Production and Marketing in Lebanon County," 11.
69. Berger, "Agricultural Production and Marketing in Lebanon County," 8); James D. McMahon, *Built on Chocolate, the Story of the Hershey Chocolate Company.* Publication info is confusing. It says Copyright 1998 Hershey Foods Corporation and lists Los Angeles and General Publishing Group, 1998, 102, 148. Information on the trolley system from Richard H. Steinmetz, *Chocolate Town Trolleys: a History of the Electric Street Railway in Hershey, PA.* Copyright 1967 by Richard H. Steinmetz, np. Pamphlet.
70. For an excellent treatment, see E. Melanie Dupuis, *Nature's Perfect Food: How Milk Became America's Drink* (New York, 2002).
71. Northampton County Agricultural Extension Archives, County Agent Report, 1932; Berger, "Agricultural Production and Marketing in Lebanon County," 24.
72. Berger, "Agricultural Production and Marketing in Lebanon County," 21-25.
73. Berks County Agricultural Extension Archives, County Agent Report, 1932, 1933, 1934.

74. Berger, "Agricultural Production and Marketing in Lebanon County," 26; Berks County Agricultural Extension Archives, County Agent Report, 1936.
75. Berks County Agricultural Extension Archives, County Agent Report, 1933.
76. W. J. Geib et al, *Soil Survey of Berks County Pennsylvania* (Washington, DC: c. 1910), 170.
77. *A 20th Century Journey: 1900-1999*. (Reading, PA, 2000), 7.
78. W. J. Geib et al, *Soil Survey of Berks County Pennsylvania* (Washington, DC, c. 1910), 167; Berks County Home Economics Extension archives, agent report, 1933.
79. Berks County Agricultural Extension Archives, County Agent Report, 1932, 1933.
80. John Z. Harner, *As told to Alliene Saeger Dechant. Seed Time to Harvest*. (Kutztown, PA, 1957), 109-110. Oral histories in Lehigh County confirm that huckstering was a widely followed practice.
81. Berger, "Agricultural Production and Marketing in Lebanon County," 7, 34-5
82. W. J. Geib et al, *Soil Survey of Berks County Pennsylvania* (Washington, DC: c. 1910), 170.
83. W. J. Geib et al, *Soil Survey of Berks County Pennsylvania* (Washington, DC: c. 1910), 171; Cyrus T. Fox, *Reading and Berks County, Pennsylvania: A History*. Volume 1. (New York, 1925), 50.
84. Joseph Interrante, "'You Can't Go to Town in a Bathtub': Automobile Movement and the Reorganization of American Rural Space, 1900-1930," *Radical History Review* 21 (Fall 1979): 151-168.
85. Paul I. Wrigley, "Farm Tenancy in Pennsylvania," Pennsylvania Agricultural Experiment Station Bulletin # 383 (September 1939).
86. Anna T. Wink, "Housing in Rural Pennsylvania," Pennsylvania State Agricultural Extension Bulletin # 472, 1945, 10-17.
87. G. A. Billings, "Dairy Farming in Southeastern Pennsylvania," Pennsylvania Agricultural Experiment Station Bulletin # 159 (September, 1919; M. C. Betts and M. A. R. Kelley, "Suggestions for the Improvement of Old Bank Dairy Barns," USDA Circular # 166 (June 1931).
88. S. I. Bechdel, "Suggestions for Selecting and Building a Silo," Pennsylvania State College Agricultural Extension Circular # 72 (February 1918).
89. I.F. Hall, "An Economic Study of Farm Buildings in New York," Cornell University Agricultural Experiment Station Bulletin #478, 1929, 60.
90. 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.
91. Stevenson W. Fletcher, *Pennsylvania Agriculture and Country Life.* Volume 2. (Harrisburg, 1950–1955), 217-219.
92. G. A. Billings, "Dairy Farming in Southeastern Pennsylvania," Pennsylvania Agricultural Experiment Station Bulletin # 159 (September, 1919); L. W. Morley, "Building the Farm Dairy House," Pennsylvania State College Agricultural Extension Circular # 107, December 1925.
93. L. W. Morley, "Building the Farm Dairy House."
94. It is not clear what the agent meant by "Missouri type" house.
95. Fegley, *Farming, Always Farming*, 34, 35, 36, 37, 40.
96. Almost every agricultural extension agent report from the period discusses the cost-price squeeze.

97. Katherine Jellison, *Entitled to Power: Farm Women and Technology, 1913-1963* (Chapel Hill, 1993).
98. Lawanda Cox, "Tenancy in the United States, 1865-1900," *Agricultural History* 18 (July 1944): 97-105.
99. The lack of postwar houses in field study records may result from the need to focus on farms with varied complexes of extant historic farm buildings.
100. Northampton County Home Economics Extension Archives, Narrative Report 1944, page 22.
101. Northampton County Home Economics Extension Archives, Narrative Report, 1945, page 33. It is not clear what the author meant by "gasoline" in a lighting context.
102. Lebanon County Home Economics Extension Archives, Narrative Report, 1953.
103. Dauphin County Agricultural Extension Archives, Narrative Report, 1947.
104. Note that while the *buildings* represent an identifiable cultural tradition, the *owners or occupants* may not have necessarily share the same cultural heritage over the entire history of the property. People borrowed, reused, and adapted. For example, an "English" farmer in southeastern Pennsylvania may have built a Sweitzer barn because it best suited the diversified farming of the region.
105. 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.
106. NR Bulletin *How to Apply the National Register Criteria for Evaluation*, p 17.
107. *Historic Farming Resources of Lancaster County*, MPDF, 1994.
108. 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).
109. "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.
110. "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
111. Ibid.
112. Ibid.
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