Historical Farming Systems and Historic Agricultural Regions: a Word About Definitions

The concept of a "farming system" is helpful as a framework for understanding how agriculture in Pennsylvania evolved. A "farming system" 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 transportation shape production too. Other components, equally important but sometimes less tangible, form part of a "farming system." 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," then, opens the way to a more comprehensive and accurate interpretation of the historic rural Pennsylvania landscape than other conceptualizations offer. Whether we seek to interpret German Pennsylvania, the "Yorker" northern tier, home dairying areas where women dominated, or sharecropping regions in the heart of the state, the "farming system" approach is the key to understanding the landscape. Conversely, the landscape can tell about the farming system.

Extensive primary source research and fieldwork has helped to characterize Pennsylvania's historic farming systems, and also to establish a number of "Historic Agricultural Regions" where historic farming systems shared fundamental qualities over a long period of time, within a reasonably well defined geographic area. These regions differed significantly from one another in soil quality and topography; product mix; mechanization levels; social organization of production; and cultural practices. The six Historic Agricultural Regions are as follows: Northern Tier Grassland; Central Limestone Valleys Diversified Farming; North and West Branch Susquehanna Diversified Farming; Potter County Potato and Cannery Crop Specialty Area; River Valleys Diversified Agriculture and Tobacco Culture; and Allegheny Mountain Diversified Part-Time Farming. Though overlap surely occurs (especially in the twentieth century), each of these areas has characteristics that distinguish it from the rest. For example, the Northern Tier Grassland area was shaped not only by the limitations of glaciated soil and the proximity of urban markets, but by Yankee/Yorker culture, while farm households in the North and West Branch Susquehanna Diversified Farming region

followed a diversified strategy that featured hogs and corn. In the Central Limestone Valleys, Pennsylvania German cultural influence was strong, and customs of share tenancy and rich limestone soil permitted one generation after another to raise wheat and livestock in a highly mechanized farming system. For a brief time in scattered river valley bottoms in the north and center of the state, tobacco culture forced significant alterations to farming patterns, and to landscapes. Potter County's specialty system flourished in the twentieth century, and for a time relied upon African American migrant labor. And finally, in the poor soils of the Allegheny Mountain Diversified Part-time Farming region, mining and manufacturing households used farming as a means to ensure family subsistence when wages were low.

Research into Pennsylvania's historic agricultural heritage quickly establishes an important point. No matter what the region or time period, where production was concerned the typical Pennsylvania farm unit was family-based, and survived by pursuing a wide variety of strategies; while particular *regions* of the state came to emphasize some products over others, *individual farms* rarely could be regarded as being specialized. So, we cannot approach historic Pennsylvania as if it were today's specialized, thoroughly commercialized agriculture writ small. The true essence of past Pennsylvania farming can only be captured by attending to the close-grained texture created by a multiplicity of small-scale, flexible enterprises, all of which served multiple purposes, including on-farm use, *or* off-farm sale, *or* barter. Thinking about Pennsylvania farms in terms of diversified production will allow for the most faithful interpretation of the Pennsylvania farmstead and rural landscape, which after all consist of a rich variety of buildings and landscape features -- with a variety of specialized spaces such as smokehouses, poultry houses, potato cellars, woodlots, summer kitchens, springhouses, and perhaps workshops or mills, not to mention intricate field and boundary patterns. This perspective also preserves -- indeed reclaims -- the contributions that a preoccupation with specialized market commodities tends to obscure: those of women, children, and farm laborers.

Central Limestone Valleys

Location

This area encompasses Nittany, Penn's, and Brush Valley and Ferguson Township in Centre County, Union County's Buffalo Valley, Mifflin County's Big (Kish) Valley, central Snyder County, the Cocolamus region of Juniata County; Sugar and Nittany Valleys in Clinton County – Nippenose, and Limestone Township in Montour County.

Climate, Soils, and Topography

The growing season in this region ranges from 140 to 170 days, and elevations range from 400 to 1500 feet.[1] Annual precipitation averages between 35 and 45 inches, with peaks in mid spring and mid summer. Cloud cover is significant.[2] In this district, high-quality limestone alfisol soils occur in fairly level valleys between narrow sandstone ridges. The valleys are long and narrow. The ridges (around 1000 feet from the valley floors) generally stretch in a northeast-to-southwest direction, exerting a decisive influence on settlement patterns and transportation routes even down to the present. Waterways were influenced too, though they also created gaps in the ridges. The Susquehanna River's West Branch skirts the eastern edge of the district.

Historical Farming Systems

The Central Limestone Valleys are set apart from other historic agricultural regions by:

- a high level of mechanization,
- a high rate of farm tenancy,
- high livestock numbers,
- high ratio of cropland to grassland and the importance of cash grains,
- Pennsylvania German cultural influence,
- and, the landscape influences of the long narrow shape of those limestone valleys.

And, a number of landscape features in the Central Limestone Valleys are specifically significant to its historic agriculture. They are:

- barns and outbuildings that reflect machinery use and storage,

[1] Pasto, Jerome, and Pritam S. Dhillon. "Farm Production Trends in Pennsylvania to 1960." Penn State Agricultural Experiment Station Bulletin # 693, 1962, 33.
[2] E. Willard Miller, et al, *A Geography of Pennsylvania* (University Park, Pennsylvania: PSU Press, 1995), 50-51.

- tenant farms or houses,
- housing for livestock, i.e. barns, hog houses etc.,
- Pennsylvania German construction, siting, and building types,
- and, a landscape pattern of linearity with farms sprouting off one road.

Settlement Era

To about 1830, agriculture and landscape in the Central Limestone Valleys shared fundamental characteristics with the rest of the twenty-four county area, so please refer to the separate narrative on "Early Agriculture" for this period.

1830 to about 1880: A High-Powered Cash Grain and Livestock Economy

A new era began about 1830 with transportation improvements. In Centre County, this was manifested mostly by road construction. A turnpike company supported links between the valleys and regions to the north and south, especially between Bellefonte and Lewistown, which in turn connected to links further down the Susquehanna Valley. State funding allowed improvement of Samuel Miles's road in Brush Valley (now Route 192) in 1840.[3] Mifflin and Juniata Counties also were linked to the state canal system, and later to the rail system.[4] Not everyone agreed that these links improved farm prices, but they did open more markets, and made it more feasible to ship bulky products.[5] At the same time, home markets also grew, for example as industries (such as charcoal iron) developed and as rural villages grew. The farming system that emerged out of these conditions was distinctive. Its products were diverse, but distributed around a core that emphasized a highly mechanized system of grain and livestock raising. Tenancy was prominent, as was wage labor. Pennsylvania German culture particularly influenced work and production patterns in the Central Limestone Valleys.

Products, c. 1830-1880

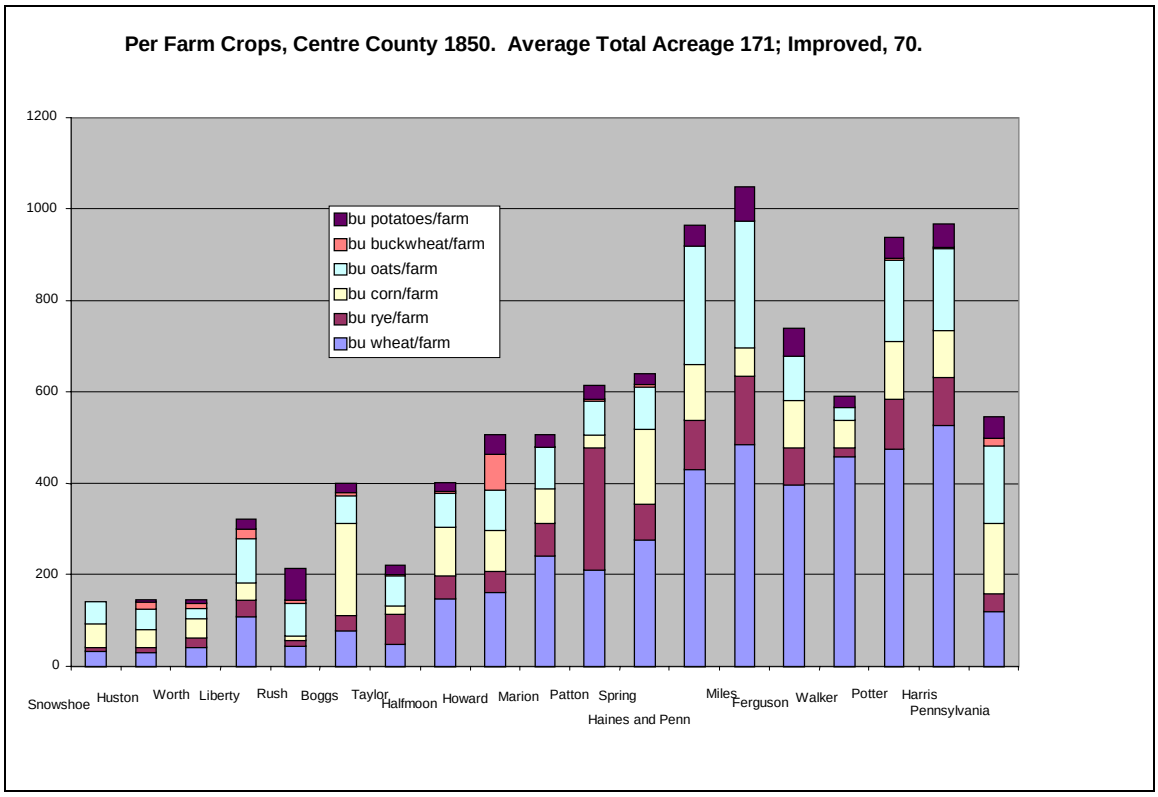
At mid-century, wheat, corn, oats, rye, hay, and potatoes were the main field crops in this period. Wheat production continued to hold an important place. Rye production -- long

[3] C. Macneal, "Two Brush Valley Barns," *Centre County Heritage* 27: 1, Spring 1990, 5.
[4] See the transportation maps in Edward Muller et al, *Concise Historical Atlas of Pennsylvania* (Philadelphia: Temple University Press, 1989), 96-97.
[5] For example, *Hazard's Register of Pennsylvania* reported in December 1834, p. 405, that a Union County farmer made more money by carrying his hogs live to the city on a canal boat and having them slaughtered at the point of consumption, than by butchering them first.

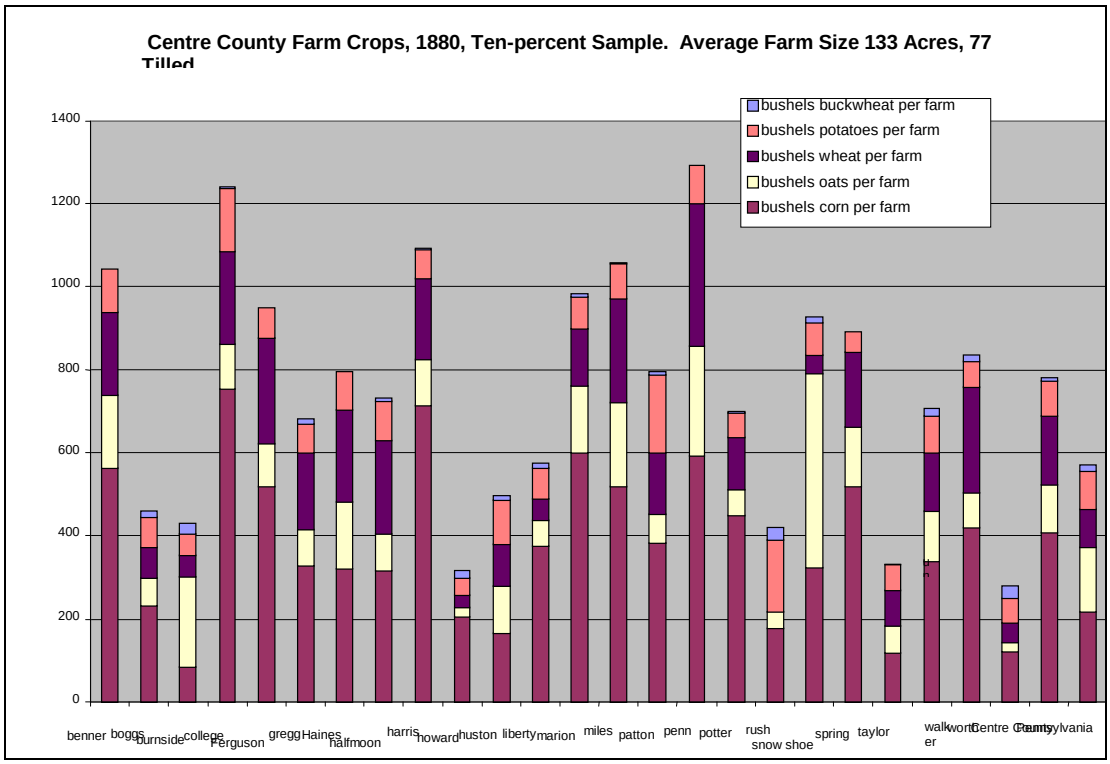
a Pennsylvania German staple—was still important at mid-century, but gradually dropped after that,[6] because local distilling no longer was economically competitive. Gradually (at least in some places) it also it ceased to be socially tolerated, but this process took a long while. Overall, the proportion of cropland to meadow or pasture was quite high in contrast to the northeastern grassland counties. Wheat continued to be more significant here than in the Susquehanna Valley or Northern Tier (and was virtually equal to livestock in importance); perhaps only in southeastern Pennsylvania was wheat more important.

It is very important to note that the increases in production statewide (including in the Central Limestone Valleys region) were accomplished primarily through land clearing, not through more intensive farming. A careful study done in the 1950s argued persuasively that *land* productivity (as opposed to *labor* productivity) did not improve significantly until the twentieth century.[7]

[6] D. W. Maynard, *Industries and Institutions of Centre County*, 1877, says rye gave way to wheat in the 1840s.
[7] Chen, Kuan-I. "Agricultural Production in Pennsylvania, 1840 to 1950". Ph. D. Thesis, The Pennsylvania State University, Department of Agricultural Economics, 1954.



This graph shows that the Central Limestone Valleys townships in Centre County produced well above the statewide averages of wheat and rye; average to above-average amounts of oats and potatoes; and below-average amounts of corn.

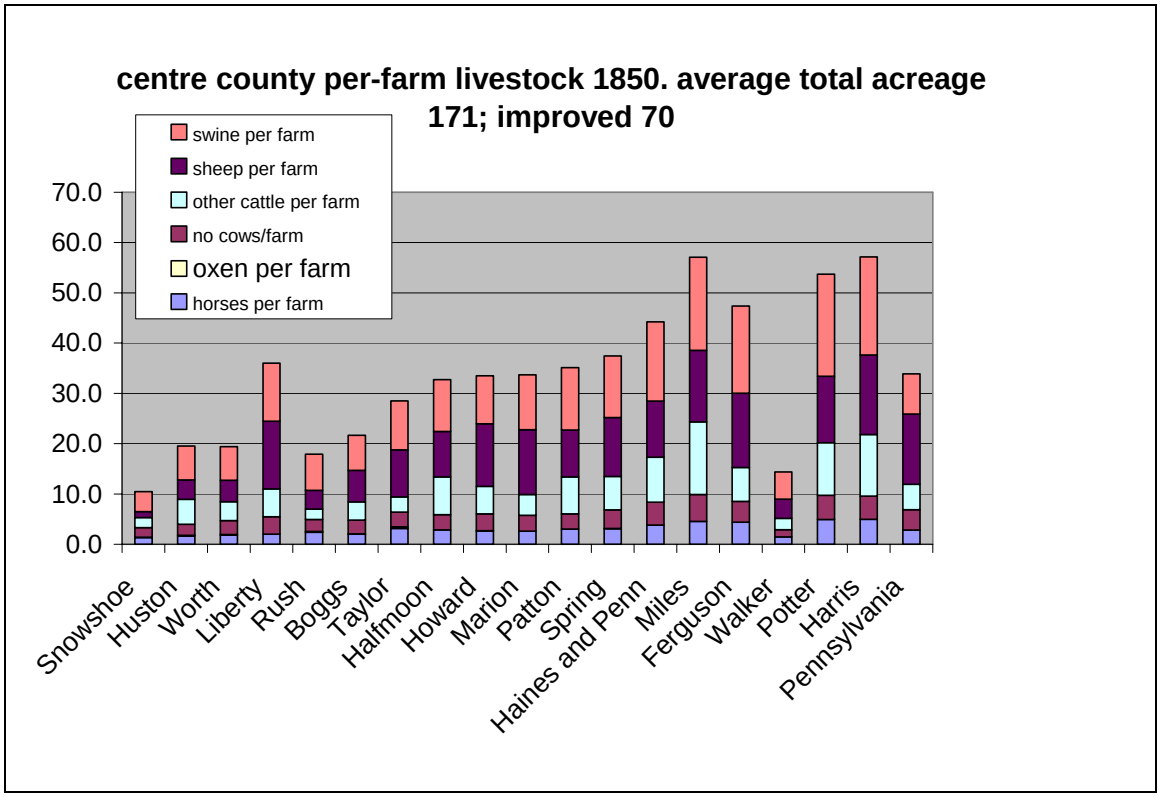


By 1880, the mix had shifted. This chart shows that Centre County Limestone Valley townships continued to produce much more wheat than the average Pennsylvania farm, but corn overtook wheat as the major small-grain crop.

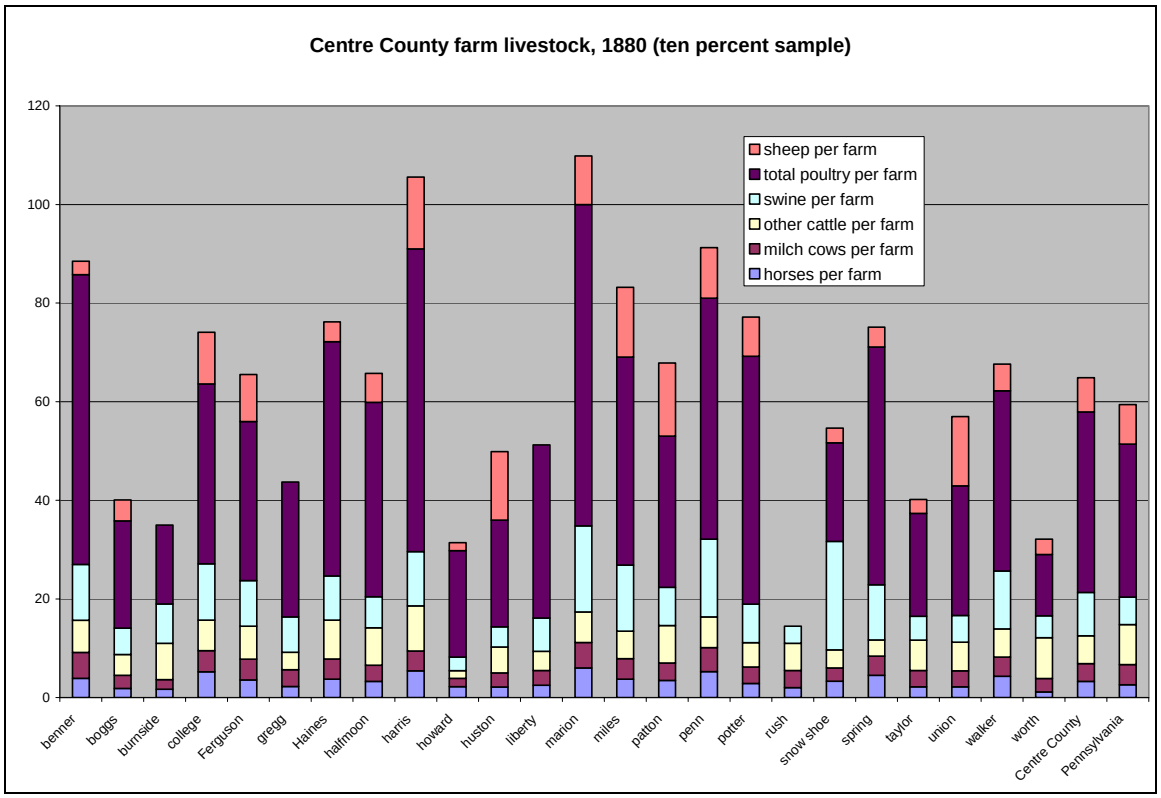
While wheat was a cash crop, most other field crops went to livestock feeding. There is evidence of a rising livestock industry. Great herds of hogs were driven east to market from Centre County in the 1850s. The average farm in a Central Limestone Valley township had at least half a dozen swine, and the farms of Brush and Penn's Valleys more commonly had three times that number. Quite a few steers were kept for beef.[8] In 1851, a local farmer reported to the United States Patent Office (predecessor of the USDA) that "Our most thrifty farmers buy up a lot of poor bullocks from the West, in the spring, to feed through the winter" and in this way they create from straw plus manure a "rich mine of manure," then they sell the fat beef for high prices in the spring.[9] D. W.

[8] *Bellefonte Democratic Watchman*, December 19, 1855 and March 16, 1856.
[9] United States Patent Office Annual Report, 1851, 241

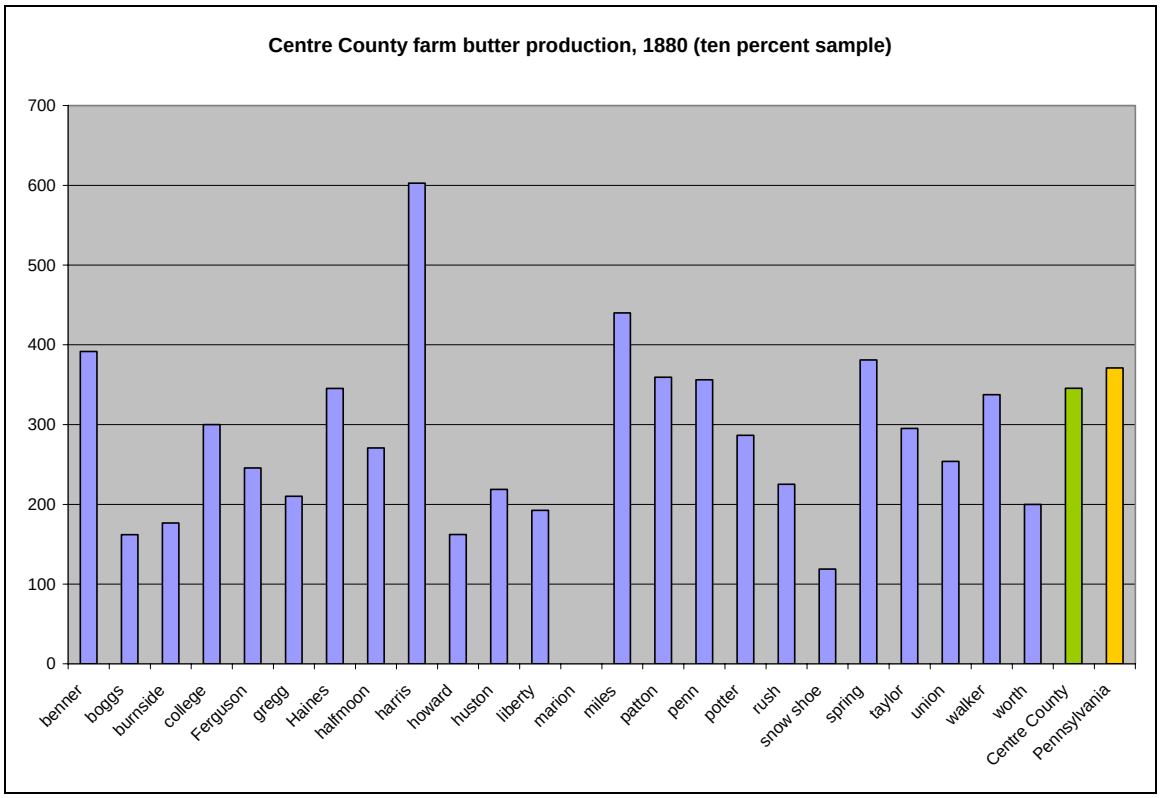
Maynard reported in 1877 that beef animals were "fattened and slaughtered for the home trade, [and] a great many are purchased every season by dealers and driven out of the county."[10] Central Limestone Valleys farms also kept above average numbers of sheep.



[10] Maynard, *Industries and Institutions*, 215; US Census published returns, 1850, 1860, 1870; Jerome Pasto and K. I. Chen, "Facts on a Century of Agriculture, 1839-1950," Pennsylvania Agricultural Extension Bulletin # 587, January 1955. George F. Johnson, "Agriculture in Pennsylvania: A Study of Trends, County and State, Since 1840." Pennsylvania Department of Agriculture General Bulletin # 484, November 1, 1929; US Patent Office Reports, 1851, gives a report from Mifflin County which says that farmers there bought bullocks from the West, fed them through the winter and sold them in spring.



This chart shows that in 1880 the Central Limestone Valleys township farms raised more livestock in general than the average Pennsylvania farm. In areas where there was pasture or meadowland, cows were milked for butter for home consumption and for sale. Many (though not all, on average) farms produced a substantial surplus of butter, all throughout the period. Milk was also fed to hogs.



The time period also witnessed an unprecedented enrichment of the farm family's "competency." Note that the term “competency” was not limited to the so-called subsistence era, but was equally popular in the market-oriented nineteenth century. It referred not to whether a farm was commercialized or not, but to whether the family secured a comfortable standard of living. Webster’s Dictionary defined “competency” thus in its nineteenth-century editions:

> *Primarily*
> Fitness; suitableness; convenience. Hence, 1. Sufficiency; such a quantity as is sufficient; property or means of subsistence sufficient to furnish the

necessaries and conveniences of life, without superfluity.[11]

This definition clearly moves beyond mere subsistence, though a more precise definition depended on the individual; one family's competency could be another's poverty, and the reverse could also hold true. It was an elastic term. But in general in the nineteenth century, rural families came to enjoy greater variety of diet and greater comfort (heating, space, probably carpeting and other amenities).[12] At mid-century, Christian Dale's family of twelve in Centre County consumed 200 bushels of apples a year as cider, apple butter, fresh, and dried.[13] They made enough butter for household use, plus an often substantial surplus. They cured, pickled, dried, salted, and otherwise processed many different foodstuffs. Jams, jellies, preserves, sausages, and other delicacies became more common. Garden produce included a multitude of crops: cabbage, carrots, onions, and so on. These were complemented by orchards (especially apples, but also peaches[14] for a time especially in Juniata County), small fruits, and potato patches. An interesting insight about enthusiasm for gardens comes from Christian Dale, in his 1851 report on Centre County farming to the United States Patent Office (responsible for collecting data on agriculture before the USDA was established in 1863). "Seeds – the seeds distributed from the Patent Office generally come under the care of the farmer's wife or daughters. Many new, and some quite superior, vegetables have appeared – some so entirely new and strange that neither as gardener nor cook could the good housewife make out what to do with them."[15] No hints were offered as to what these strange plants were, though.

In sum, it is called a grain and livestock system, because the products that claimed pre-eminence in it were cash grains (wheat, and corn to some extent) and livestock and their products: beef, dairy, and hogs. Cropland not in wheat was geared to producing livestock feed: oats, corn, and hay.

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[11] *Webster's Dictionary*, editions of 1828, 1852, and 1904. Daniel Vickers, "Competency and Competition: Economic Culture in Early America," *William and Mary Quarterly* 3rd Ser. Vol. 47 No. 1 (January 1990): 3-29.
[12] Richard Bushman, *The Refinement of America: Persons, Houses, Cities.* New York: Vintage Books, 1993.
[13] United States Patent Office Annual Report, 1851, p. 241
[14] George C. Butz, "The Peach Industry in Pennsylvania." Pennsylvania State College Agricultural Experiment Station Bulletin # 37, November 1896.
[15] United States Patent Office Annual Report, 1851, p. 241.

Labor and Land Tenure, 1830-about 1880

Farm work was much more mechanized here than in most of the state. On a per-farm basis, the central limestone valley farms had more horses than average, and a well above average value of implements.[16] Local newspapers contain rich and extensive accounts of the farm machinery that was available in the valleys by the 1850s and 1860s. These included threshing machinery, grain drills, corn fodder cutters, horse rakes, corn shellers, and many more, often produced locally, sometimes with locally available iron.[17] By the 1880s many farms had a full range of agricultural implements. In Union County, implement makers at Lewisburg dramatically increased production of the "Buckeye" and Hussey reapers and the "Valley Chief" reaper/mower.[18] Mifflinburg (in neighboring Union County) was well known for its wagon works. In short, farm labor processes were highly mechanized.

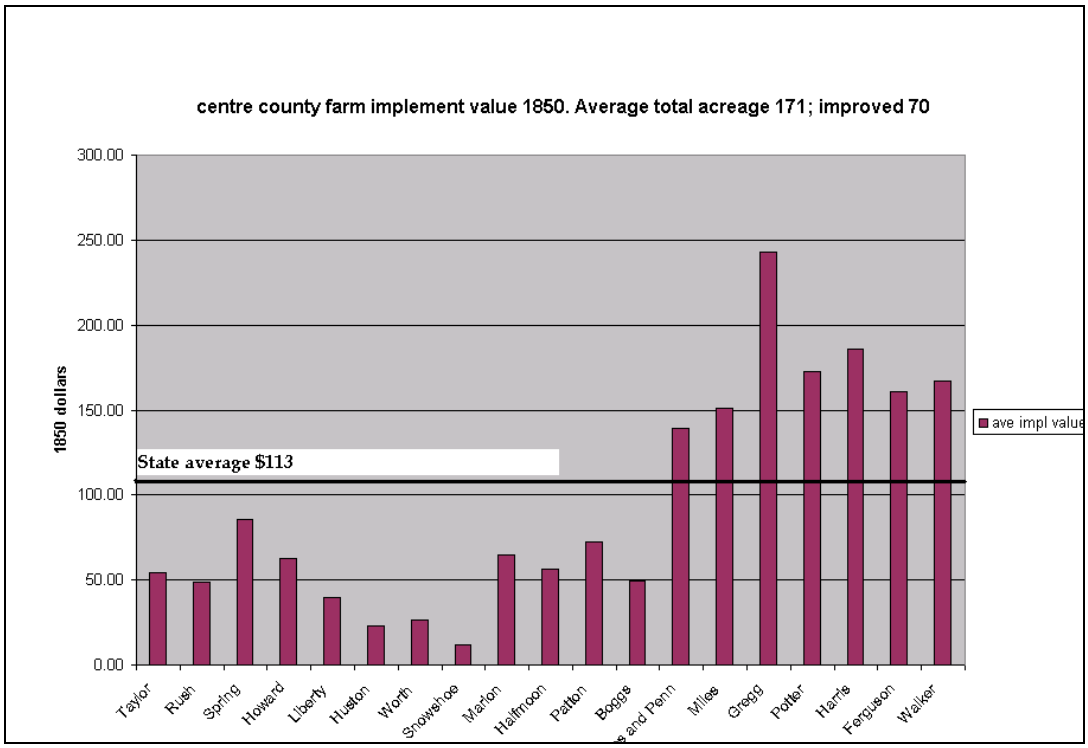
Why did the Central Limestone Valleys embrace mechanization? Their extensive field crops, particularly wheat, were one reason. The processes for mechanizing the harvesting, threshing, and winnowing wheat attracted a lot of attention, because the labor needs were so acute and time-sensitive, because the crop was so valuable, and because high yields created sufficient return on investment. Another reason may have been the proximity of local ironworks, which meant that implement makers could easily avail themselves of materials. As well, the ironworks may have competed with farms for labor, so perhaps the incentive to acquire farm machines was greater also. The institution of tenancy seems also to have had a relationship with high levels of mechanization. Tenants typically "found" their own implements. Since they did not have to sink capital into land, they could divert it into machinery. Incomes from tenancy, even share tenancy, apparently could sustain investment in livestock and machinery.

What was the impact of mechanization on the farm economy and society? Historians describe a number of general effects of mechanization in the North. These include increasing capital requirements, which meant diminished access to farming. Patterns of labor and social structure changed. For instance, intermittent wage labor slowly replaced

[16] Manuscript Agriculture Census for Centre County/Potter Township, 1850, 1860, 1870
[17] *Bellefonte Democratic Watchman*, August 13, 1857; October 8, 1857; Bellefonte *Central Press*, February 9, 1866; US Patent Office Report, 1849, 201, notes that threshing machines were in common use in Union County.
[18] Charles McCool Snyder, *Union County Pennsylvania*: *A Celebration of History* (Lewisburg, Pennsylvania: Union County Historical Society, 2000), 41.

the live-in hired hand, and overall, the need for human hand labor declined. Rural people migrated to the West or to the cities. Communally shared hand labor declined, for example threshing. Labor discipline intensified, for example in time-discipline and enforcement of temperance. And gender patterns of labor changed: men's work mechanized before women's. Where agricultural production was concerned, mechanization brought shifts in field patterns, as small fields were consolidated to make fuller use of equipment. Labor productivity increased dramatically, though land productivity did not. These changes took a century to complete.

While all of these changes have been well documented for the North as a whole, it is less easy to assess the changes wrought by mechanization on the local level in the Central Limestone Valleys. It is not at all clear that tenancy developed because mechanization costs had made landownership prohibitive; tenancy was a prominent feature of agrarian life starting in the settlement period and continued at more or less even levels well into the twentieth century. There is evidence for emigration, suggesting that young people found it hard to break into farming (and other types of employment for that matter). There is little evidence of time-discipline or temperance in these areas. Certainly the work that mechanized was mostly men's. But even the supposed consolidation of fields lacks evidence from Centre County; in fact, reformer John Hamilton complained in the 1870s about the surfeit of small fields and fences, and the acreage of each crop (and therefore field size) changed little between 1850 and 1930.

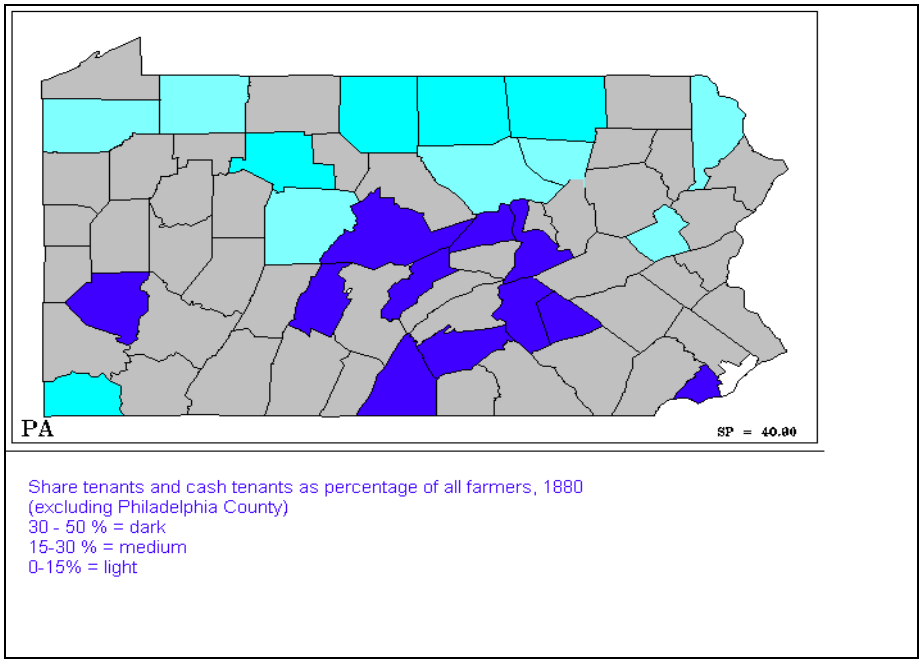


Centre County average value of implements per farm, 1850. Statewide the average was $113. The limestone valley townships are the last seven on the right. The other townships belong to the Allegheny Mountain part-time farming region.

Farming in the Central Limestone Valleys was characterized by a high rate of tenancy, from 40% to over half in some spots.[19] The terms of tenancy shifted in this period as the land-clearing needs abated; tenants now owed crops, usually paying one-third or two-fifths of the grain and keeping the rest. Tenants typically paid taxes on the property, were obliged to put up fences, and supplied their own livestock and often equipment too. Many tenancy agreements were for one year only. The diary of Brush Valley resident

[19] Glenn Houghton, "A Survey of the Agricultural Conditions as Found in College Twp, Centre County, PA in the Fall of 1911." Thesis (no degree indicated), Department of Dairy Husbandry, Pennsylvania State College, 1912, found that only 20% of the 25 farms he analyzed in College Twp were owner operated.

Samuel Gramly, for example, shows how his tenants changed every single year.[20] In March or April "flitting time," families all over the valleys changed houses for a new contract year. However, most tenants and landlords were related by blood or marriage. Renting out a farm on shares to a son (or son in law) allowed farm parents to retire. Retirement became a more common practice, and indeed the growth of many country villages in this period (such as Centre Hall) owed much to the in-migration of older adults.[21] Organizations such as the Grange and fraternal societies grew, and villages became active focal points for rural communities.[22]



Share tenants and cash tenants as percentage of all farmers, 1880
(excluding Philadelphia County)
30 - 50 % = dark
15-30 % = medium
0-15% = light

Even though farming was so highly mechanized, labor was still in demand. Sons and daughters still supplied most of it; and probate records suggest that even after turning 21, many often were not compensated in money. In addition, many farms reported paying

[20] Samuel Gramly Diary, PSU Special Collections. See also Snyder, *Union County Pennsylvania*, 43, who says "many farmers were "croppers or tenant farmers, who received a half or smaller portion of the crops in return for their labor…"
[21] See Snyder, *Union County*, p 44; Ralph Illingworth, *a Passing Glance at Penn's Valley*, 1896, p 6.
[22] Community Program Study of Centre Hall, PSU Special Collections, AX2521. These studies were done through the Agricultural Economics and Rural Sociology departments in the 1930s through the 1950s.

wages for at least one or two hired hands. The manuscript population census, tax records, and other primary materials[23] suggest that by mid century there was a growing proportion of propertyless, unskilled young men who would have formed the rural labor pool. For example, in 1860, the population manuscript census shows that in Haines Township, 40% of households were headed by men listing themselves as farmers; 25% were headed by "laborers" and 25% by artisans; and the rest of household heads had other occupations. The census only recorded male wage labor, but women worked on farms for wages, too, doing the same kind of work the farm wife performed.[24]

Buildings and Landscapes, 1830-about 1880

Houses, 1830-about 1880

During the first part of this period, farm families in the valleys erected more permanent buildings or at least upgraded their older log buildings. In housing, a mix of the emphatically regional (such as the double door house and the locally distinctive brick farmhouses) coexisted with more generic "national" influences as seen in simple center-gable houses, two-story houses in an "L" configuration; and village housing, which often sported Victorianized "skins" over conventional forms. The residential landscape also reflected the pervasiveness of tenancy: modest, largely un-ornamented three-or four-bay, single- or double-pile tenant houses contrasted noticeably with the "mansion" houses, which tended to resemble one another and to be more ostentatious, through construction material (stone or brick), ornamentation (cornice decoration, door transoms for example), and scale.

Building materials were dominated by frame and even log, but many fine brick houses were erected in this period and they survive in disproportionate numbers. The basic formal vocabulary was quite consistent. Houses were three, four, or five bays wide, two stories high, and usually two rooms deep. In Centre County's Brush Valley, the three-bay house with square footprint, sited near springs at the ridge base, was very common. Interior plans varied; at least two houses in Brush Valley had a three-room plan reminiscent of eastern Pennsylvania German forms; but instead of the massive central

[23] Simon Harper diary, *Centre County Heritage* 2004.
[24] *Letters to Carson Long* (New Bloomfield, Pennsylvania: The Carson Long Institute, 1931), 58, 69, 89; Theodore K. Long, *Tales of the Cocolamus* (New Bloomfield, Pennsylvania: The Carson Long Institute, 1936).

chimneystack, they had gable-end corner fireplaces.[25] Many "four over four" houses appeared in this period. This term is used to refer to two-story, two-room deep gabled houses that characteristically have four symmetrically placed windows on the second story, placed directly over four openings on the first story. Usually the first-story openings consist of three windows and an off-center door; but sometimes there are two central doors flanked by windows instead. This form is common in Pennsylvania German country.[26]

Arney House, Centre Hall, Potter Township, Centre County. Four-over four, two-door house.

A five bay center door form was also fairly popular. Often the earlier of these buildings were modernized during the prosperous days of the 1860s, usually with either an ell or a gable-end addition.

[25] Douglas Macneal, "Rebersburg, 1861," *Centre County Heritage* volume 38 (2002), see especially Appendix 5, "Modernizing an Old Farmhouse."
[26] Richard Pillsbury, "The Pennsylvania Culture Area Reappraised," *North American Culture* 1987: 37-54, differentiates between what he calls the "Continental" four over four, which is a the four-bay house supposedly derived from the "Continental" three-room house; and the "Pennsylvanian four-over-four," which is a five bay house with central door and central hall, and four rooms on each floor. Barry Rauhauser, on the other hand, in "The Development of the Pennsylvania Farmhouse Type in Manchester Township, York County, Pennsylvania," MA. Thesis, University of Delaware, 2002, uses the term "four over four" to refer to the number of exterior bays. Henry Glassie, "18th-century Cultural Process in Delaware Valley Folk Building," *Winterthur Portfolio*, 1971: 29-57, discusses the appearance of the "Pennsylvania farmhouse." See also Dennis Domer, "Genesis Theories of the German-American Two-Door House," *Material Culture* 26 (1994): 1-35.

Five-bay house, Orndorf Road, Centre County.

Manor Road, Centre County, five-bay house.

Two over three-bay house, Paradise Road, Centre County. This was a common type.

This house on Middle Road, Centre County, has a center gable and a two-story ell.

Tenant housing is something to look out for, especially in Union, Centre and Mifflin Counties; probably less so in Juniata. Previous historic sites surveys have seldom documented tenant houses, but the high rate of tenancy suggests that subsidiary housing must be reckoned a significant feature of the farming system. Often, the tenant operation consisted of a separate, tenant farm with its own house and outbuildings. However, in some cases, perhaps, since so many landlords and tenants were members of the same family, we should look for the "*gross dawdi* or *gross mudda*" house for the retired parents, rather than for a separate tenant house. A picture in Charles Snyder's *History of Union County* shows an almost row-house like arrangement in which the two dwellings directly abut one another and share a roof and a porch, but have visually distinct sections and separate entrances.

In other cases, there will be a separate tenant house near the "mansion house," (this term is a historic one) and it will likely be more modest than the "mansion house." There may be more than one of them. In Centre County, documented tenant houses tend to be frame (not brick or stone); often just one room deep and three bays wide; less ornamented (or not at all); sometimes with a center gable in the eaves. Look for pairs of "mansion" and "tenant" in the same vicinity.[27] However, tenant farms may have their own barns and

[27] There are also other ways of finding possible locations of tenant properties:

- In the county landownership maps or atlases, the appearance of the same name in different places suggests that this person is a landlord. For example, in Centre County's 1874 atlas, Moses Thompson's name appears next to many different properties. In his case, we know where he resided, so we can reasonably assume that the others are tenant properties. Note that this means that in areas where tenancy has a significant presence, one shouldn't assume that the name next to a property denotes the *resident* on the property. Another way in which landownership maps indicate tenancy is through the use (inconsistently) of designations such as "res" (residence) and "oc" (occupant). In Centre County, J. H. McCormick (check) is an "occupant" of land actually owned by someone else; by contrast, where several properties bear the name "Neff," one notes "J. Neff (res)."
- The 1880 agricultural census manuscripts clearly state whether the farmer is a tenant or owner, and whether he rents for cash or shares.
- In the case of Centre County, tax records from 1850 onward clearly separate "owners of real estate," "tenants," and "single freemen," and they indicate how landlords and tenants are connected, i.e. they list the name of the landlord along with the names of his tenants. One caveat is that these records are most clear when landlord and tenant reside in the same township.
- Family or corporate papers often contain "articles of agreement" or leases which spell out terms of tenancy. They are usually filed with financial and legal papers.

outbuildings. Some sources[28] mention laborers' cottages near the main farm where they had "their own gardens, potato patches, cows, pigs and chickens." Nothing is known about this type of housing. Further east and much earlier, a similar type of arrangement was common[29]; but nothing is known about the actual architectural implications for either period.

Gillilland tenant house, Centre County.

- Daybooks and farm account books often give clues as to tenancy, for example when they list receipt of crop rent.
- Probate records of landlords often contain evidence about tenancy, for example in the form of receipts for "rent grain," or items in a will which dictate how to dispose of tenanted property, probate records which contain receipts for construction work on tenant farms, etc.
- Reports of observers (for example in the transactions of the state agricultural society or the reports to the U. S. Patent Office, before the USDA was a separate department) often describe tenancy arrangements.
- Agricultural extension bulletins, for the later period, contain useful information on tenancy. In Centre County, for example, local agricultural extension workers were concerned that old-style contracts did not work for dairy farmers, and they published alternative sample contracts.
- Local newspapers (in this case, the *Centre Reporter* published in Centre Hall) often mentioned tenants in their local columns.

[28] Theodore K. Long, *Letters to Carson Long*, p 90.

[29] Lucy Simler, "Tenancy in Colonial Pennsylvania: The Case of Chester County." *William and Mary Quarterly* 3d ser., 43, No. 4 (October, 1986): 542-569. Check for a piece on the "house and garden" in Delaware, possibly in Perspectives in Vernacular Architecture; check VAF Bibliography, page 47.

Barns, 1830-about 1880

The Pennsylvania Barn was the norm in the central limestone valleys. This form was evolving in southeastern Pennsylvania just as emigrants were beginning to fill up the central limestone valleys – in the late 18th and early 19th centuries. It rapidly became the dominant type. Though it originated in the Swiss Pratigau region and was developed in the New World by people of Germanic stock, it was such a successful form that people of many ethnic backgrounds adopted it. Nevertheless, it is historically associated first and foremost with the Pennsylvania Germans.

The Pennsylvania Barn's main diagnostic feature is the projecting forebay, or overshoot. The barn is set into a bank, and organized such that the upper level consists of central threshing floor(s), flanked by mows, and complemented by a granary (sometimes in the forebay, sometimes next to a mow on the bank side). Occasionally a granary "outshoot" would extend back from the bank side. Hay and straw were stored in the mows, and grain or feed in the granary and in a loft area (*overden*) above the threshing floor. Opposite the bankside entrance, threshing doors in the forebay could be opened to provide cross ventilation during the processes of threshing and winnowing. This second level is accessible from a ramp leading from the bank. On the ground level, there were stables. In early Pennsylvania barns, these were arranged crosswise to the roof ridge, and accommodated horses, milch cows, other cattle, and sometimes other animals such as sheep. A series of doors beneath the projecting forebay led to and from animal pens and feed alleys. The forebay side usually faced south, and often a stone or wood fence enclosed the barnyard on the forebay side. The whole thing was efficiently organized to take advantage of gravity power (hay or feed could be thrown down to the animals, and sometimes water was piped downward too). It also served well a diversified, mechanized grain and livestock system, and aided in the capturing of manures. It represented an intensification of husbandry relative to the early days of free roaming livestock and light, seasonal feeding patterns.

The flexible Pennsylvania barn form could be manipulated rather easily. Tiny structures served small farms. Others stretched to a hundred feet or more through incremental gable-end additions. Some had multiple threshing "floors". Over time, other common additions might include an open bay for machinery; a corncrib; a "horse power" addition (usually on the bankside) for a power sweep. In general, barns got bigger in the mid and late 19th century. This increase in size is normally taken to reflect larger herd size. However, farm size was dropping (as large parcels were divided among heirs) and so was

herd size. Rather, larger barns probably reflect a) simply more acreage in production (not higher yields); b) increased motivation to shelter and feed animals better, to make them more productive; c) the need to accommodate more machines; and d) in this area, quite possibly the institution of share tenancy. The McWilliams barn in Brush Valley, for example, had two separate granaries.

Neubert barn, Rimmey Road, Centre County. Forebay side. Notice doorways to feed aisles and animal pens. This example has a machinery storage bay incorporated into the lower level.

Neff stone end barn, Potter Township, Centre County.

Pennsylvania Barn, Linden Hall Road, Harris Township, Penn's Valley, Centre County.

Spring House, 1830-about 1880

The spring house was a key site for dairy work. It was constructed over a spring or over a running stream, and it was often banked. Spring houses could be a single story but often had a second story that served for storage, dairy processing, or sometimes even residential quarters. The point of the springhouse was to provide a cool space and fresh water. Stone-lined channels or tanks were carefully engineered to take full advantage of running or spring water. These would enable the dairywoman to cool milk and other perishable food items. Shelves were arranged so that milk pans could be set on them, and cream could rise. Churning, salting, working of butter could also take place in or near the spring house. Springhouses located so far in Centre County are small, and not always sited near the house. Their location is often given away by willow trees. There would be more springhouses in areas such as Mifflin County where per-farm butter production was higher.

Spring house with projecting gable roof, Gregg Twp, Centre County.
The willow tree gives away the spring's location.

Summer Kitchen, 1830-about 1880

The separate kitchen was present on some farmsteads even in the early period (1798, 1796 records).[30] This would be a small, one or two story structure sited near the main house. Of course it always had a cooking fireplace, (also sometimes a bake oven) or later a stove. The standard assumption about these buildings is that they functioned to remove heat and especially messy tasks from the main house. While this explanation is logical, it is mostly untested. In Somerset County, for example, detached kitchens appeared in two periods and seem to have served two different purposes. Early ones (c 1790-1820) appeared most often on the properties of artisans and tavern keepers, suggesting a function related to those occupations; while a later wave in the late 19th and early 20th century removed heavy food processing (but not always everyday cooking) from the main house. The later wave coincided with the elaboration of the farm family's "competency." The very term "summer kitchen" did not seem to come into common use until the mid 19th century.[31] It is quite possible that the timing of its appearance can be related to the adoption of the stove for both cooking and heating. Here's why: the wood-burning cook stove, popularized from the mid 19th century onward, did create considerable heat and took up space in the middle of a room, unlike its open-hearth predecessor. Simultaneously, heating stoves permitted greater architectural flexibility, because a building didn't need to be designed around heavy, structurally complex hearths and flue systems. The result was that cooking was increasingly isolated within the house, and the extreme expression of this was the summer kitchen. There is also evidence that people actually moved the cook stove into the main house for the winter, and into the summer kitchen for the summer.[32] The summer kitchen should also be interpreted as a reflection of the increasingly complex subsistence work, done mostly by women, in this period.[33] Overall, most summer kitchens are likely to date to the very end of this period

[30] List A of the 1798 Direct Tax for Bald Eagle and Patton Townships, Mifflin County, included areas presently in Spring, Benner, and College Townships, Centre County. Of the 38 properties listed, 31% had separate kitchens. That same tax record for "Potters Township" noted 16 houses, seven of which had separate kitchens (Information from conversation with Jerry Clouse.)

[31] Eli Bowen mentions a "summer dining kitchen" in his *Pictorial Sketch-Book of Pennsylvania*, 1852 edition.

[32] Brewer, Priscilla, *From Fireplace to Cookstove: Technology and the Domestic Ideal in America.* Syracuse: Syracuse University Press, 2000. More evidence for seasonal use of summer house is in Houghton thesis about College Township, where he says that milk is stored in the cellar during the summer and in the summer house during winter.

[33] For mention of a wagon shed, see *Centre Reporter* Feb. 15, 1900.

(i.e. around 1880) onward. Architectural characteristics of the later summer kitchen include: frame construction, often of a higher level of finish than would be found in rougher outbuildings; stove or set-kettle; tables; windows. Some historians suggest that families actually ate meals in the summer kitchen in summertime.[34]

Summer kitchen in foreground, Paradise Road, Centre County.

[34] Families in Cumberland County did eat their meals in the summer kitchen – Jerry Clouse conversation with Author.

Summer kitchen and house, Heckman Cemetery Road, Centre County.

Smoke House, 1830-about 1880

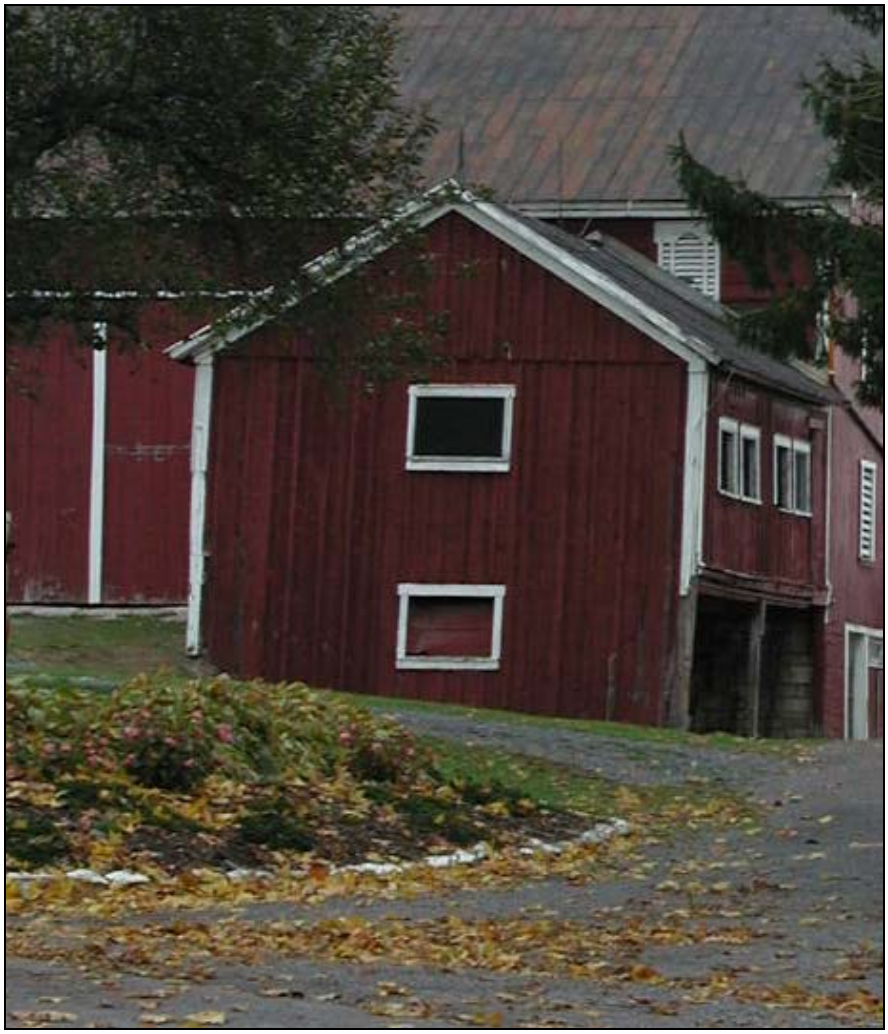
This is another structure that, in the central limestone valleys, was central to Pennsylvania German foodways.[35] The smoke house, then, can be interpreted as an expression of both ethnicity and production strategies. In Cumberland County, smokehouses were common on most farms in this period, whether settled by Anglos or Germans. But interestingly they appear to have been less common in non Pennsylvania German areas such as the Northern Tier. While no systematic survey has been undertaken, it seems possible that smokehouses are more common where foodways emphasize pork – i.e. in Germanic Pennsylvania or the American South. The smokehouse is a small structure, often with a square footprint, of frame or masonry, windowless, with facilities inside for smoking meat. These facilities usually consist of a hearth, and hooks or laths from which the smoking meats could be suspended. The smoke house was usually near the main house. Hams and bacon were smoked here in the

[35] Of course it is not purely an ethnic type; smokehouses are very common in the American South, too.

late fall. Smoke houses should be considered a mixed-gender, community workspace, as most often neighborhood men and women cooperated at butchering time.

Smoke house, Rhoneymeade, Centre County.

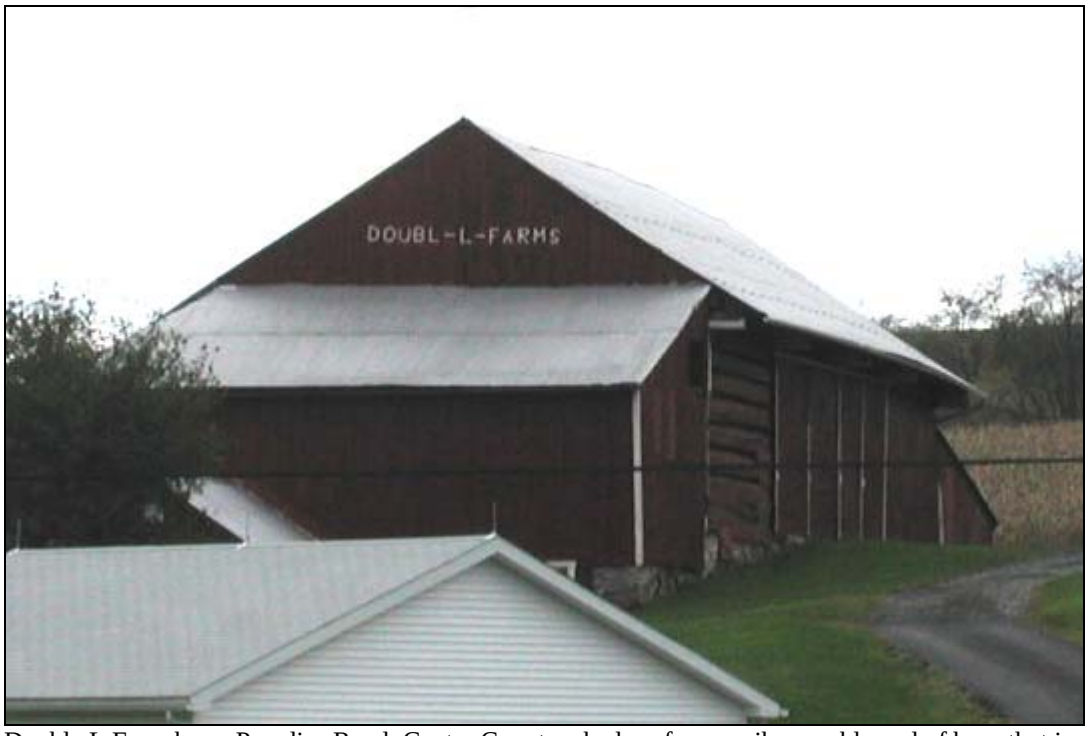
Machine Shed, 1830-about 1880
As farms added more and more machinery, more storage for it appeared. Barns sometimes incorporated bays for machinery, and also separate sheds were erected. The 1911 Houghton thesis on College Twp in Centre County mentions a "tool shed" more than once; one is a combination tool house, corncrib/machinery storage. There is some contextual evidence that he actually means machine shed.



Machine shed, lower portion of barn addition, Long Lane, Centre County.

Root Cellar, 1830-about 1880
A root cellar consists of an excavated underground area, lined with masonry and sometimes shelves, and having an entrance. It's usually between the house and barn. Sometimes its roof is barrel shaped. Its purpose is to exploit the year-round constant temperature that prevails below frost level (around 50-55 degrees) to preserve such items as potatoes, carrots, cabbages and other cole crops (crops in the cabbage and kale families), and turnips, and other root crops. Some houses further east had root cellars adjoining the main house and accessible via a tunnel, but none has been identified in the Central Limestone Valleys.

Corncrib, 1830-about 1880
Generally speaking this building became more important in the central limestone valleys as the importance of field corn rose, late in this period. The corncrib was needed to store field corn in the ear. Its features would include slats (usually horizontal wooden ones) and/or wire netting for ventilation; doors in the ends for accessibility; anti-rodent provisions (elevating it off the ground level, tight flooring). The earliest corncribs were made of log; it's doubtful that any of these survive in the study area. "Keystone" shaped cribs, flaring from bottom to top, were designed to prevent settling and shed water. Once machine-milled beveled boards became available, designs tended to feature straight sides rather than flared ones. "Cribbing" boards came in several different profiles: slats on wedges, triangular slats cut from two by fours; and beveled cribbing. The last of these could be spaced an inch or so apart, thus providing ventilation; other types overlapped. Most corncribs had wire mesh inside to protect from vermin. Double cribs are not uncommon; these usually consisted of two single cribs, roofed over with a sheltered space between for husking or machinery storage. Sometimes the interior side of the crib would be vertical and the exterior sides slanted. (and sometimes there would be a shed with a single corncrib.) Corncribs could stand alone, or be incorporated into a barn assembly, either as an integral feature or (probably more frequently) as a shed roof extension.



Double L Farm barn, Paradise Road, Centre County; shed roof corn crib on gable end of barn that is at least partially built of log.

Hog House, 1830-about 1880

The hog pen (*schwein-stall*) occupied an important place on the Pennsylvania German farmstead. Located on the forebay side of the barn, or between house and barn, it was south facing, well drained; and sometimes shaded. The hog pen's location reflects its significance as a mixed-gender workspace. Kitchen scraps and skim milk or whey were fed to the hogs. The hog pen sometimes had hens' quarters above; since women and children were in charge of both, it served as a multipurpose workspace. Hogs were a cornerstone of family subsistence and Pennsylvania German foodways – from them came hams, sausages, scrapple, and other Pennsylvania German delicacies. Hog pens had a shed roof or sometimes a gable roof; a door in the gable end or side. Early hog pens[36]

[36] See Winslow Fegley, *Farming Always Farming: A Photographic Essay of Rural Pennsylvania German Land and Life* (Birdsboro, Pennsylvania: Pennsylvania German Society, 1987), 33, 36, 43

had some ventilation but few if any windows; later ones[37] might have a window for each stall, but often located high up. The hog pen was designed to ensure warmth and dryness; these had to be balanced with ventilation. Shelter for pigs did not generally become a priority until the practice of letting them roam was curtailed, whether because of market considerations or regulations. The hog pen and corn barn were natural complements. In 1850, the average farm in the Central Limestone Valleys had at least half a dozen and frequently two or three dozen pigs. Hogs were fed dairy products[38] so there may also be a relationship of hog pen to barn and/or spring house.

The same interpretive question must be asked of the hog house as with the smokehouse: should these outbuildings be interpreted as ethnically neutral productive spaces, or as ethnically (or at least culturally) inflected productive spaces? The argument posited here is that in this specific historic agricultural region, there is a strong possibility that hog houses and/or smoke houses possessed not only productive but ethnic significance. Why? Because hogs and their products were emphasized more in the heavily German townships than elsewhere, and because Pennsylvania German foodways have a documented, strong link to pork products: scrapple, hog belly, and sausages, to name a few. Not every hog house or smoke house will be associated with Pennsylvania Germans, and hog houses and smoke houses will be found in all regions; but in the aggregate, they will tend to appear where there are high populations of Pennsylvania Germans. Notably, fieldwork in the "Yankee" Northern Tier did not positively identify any hog houses or smoke houses.

[37] Amos Long, *The Pennsylvania German Family Farm The Pennsylvania German Farm: A Regional, Architectural, and Folk Cultural Study of an American Agricultural Community* (Breinigsville, Pennsylvania: The Pennsylvania German Society, 1972).
[38] Maynard, 215. It is not clear if the position of hog house changed with the arrival of the milk house.

Linden Hall Road, Centre County. The outbuilding in the rear has the clerestory that could suggest a hog pen.

This Juniata County building, from an undated photo, may be a hog house. The evidence: scale, linear arrangement with respect to yard, windowless lower level, fenced in area. Juniata County Gen Web site.

Orndorf Road, Centre County. Possible hog house in foreground; double corncrib with center machine shed in background.

Ice house, 1830-about 1880
The ice house served an important purpose in the days before refrigeration. Ice was harvested from ponds or rivers in wintertime, and stored in these tight, well-insulated, carefully ventilated buildings. Characteristics of ice houses include blank walls, roof ventilator, insulation in the walls, drains built into the floor, and sometimes a small, adjoining workroom. No ice houses firmly dating to this period were found in fieldwork, but see below for examples of later ones.

Combo Structures, 1830-about 1880
Many outbuildings of this period combined functions: corn crib/machine shed; summer kitchen/bake house; hog house/chicken house; and so on.

Landscape, 1830-about 1880
Relationship of House, Barn, and Outbuildings
In this period, house, barn, and outbuildings shared a tight visual, functional, and spatial relationship. Visually, (on well to do farms especially), house and barn often partook of a common architectural vocabulary, in terms of form, scale, the rhythm of openings, banked construction, etc.[39] In turn, outbuildings also shared the language of construction,

[39] Plate 5 in the 1940 Soil Survey of Union County shows a pairing very nicely.

proportion, and relationship to the house.[40] Site plans show that usually, the entire farmstead was located on the same side of the road. Farm building arrangement varied considerably, with linear layouts, loose "courtyard" arrangements, and "L" layouts among the more common ones. Farmsteads often were located back from the road, at the base of the ridges where springs were abundant. Sometimes roads were then built which connected these farmsteads to the main roads running parallel to the ridges. Tenant farms were connected to the "mansion house" farm by pathways.

Field Patterns

In the central limestone valleys, cropland was much more important than meadow (for hay) or pasture (for grazing). William Waring reported from Centre County in 1851: "Of 100 acres of clear land, 40 acres are usually in wheat; 30 in corn; 10 in oats, rye, potatoes, and sometimes barley; 10 acres of mowing ground and 10 of pasture; 12 to 15 acres of good timber are required for such a farm, but the mountains supply much timber to the valleys." Other sources corroborate that probably only a tenth of the improved land was in pasture; contrast this to the pattern in the Northern Tier, where grasslands could take up half or more of the improved acreage. The central limestone valleys historic rural landscape therefore looked quite different from the Northern Tier. Variegated monocrop fields probably even had different coloring than the palette of green shades in the northern tier. As more acreage was cleared and fenced, fields became more regularly shaped, usually square but still relatively small. Later they were enlarged (often by lengthening) in order to accommodate machinery.

Woodlot

Virtually every farm had a woodlot. Typically a woodlot would be on sloping land; in the Central Limestone Valleys this would mean at the base of the ridge or on the ridge slope. Often a woodlot would be an entirely separate piece of property; the tax records commonly list low-valued "mountain land" along with farm-sized acreages.

[40] Christopher Macneal, "Two Brush Valley Barns," argues that by mid-century, farmstead layout had shifted to a more linear organization, and more often oriented to the road, thus symbolizing greater attention to commercial ventures. It is not clear that this was a pervasive trend. Many improved farms were located well off the road, and others (above for example) integrated "improved" forms into older arrangements. Macneal sees in the linear arrangement a greater withdrawal of women from harvest etc, but there is ample evidence that women remained central to farm labor and production.

Ornamental Plantings

In many cases, it is easy to identify where the house is located, because it often is surrounded by ornamental trees and windbreaks. Willows, cedars, maples, hemlocks, evergreens, locusts, and oaks were popular as were flowering trees. Many of these ornamental plantings probably date to the twentieth century, but some may be older.

This farm near Heckman Cemetery gives a particularly good view of ornamental trees, windbreaks, fencing, and the relationship of buildings to one another.

Orchards

Nearly every farm had an apple orchard at least. Centre County apple orchards averaged around 30 trees.[41] In the late 19th century, Juniata County had 3,000 peach trees. While orchard sites remain from the 19th century, orchard trees will be much younger.

Fences

One very notable visual difference between 19th century field patterns and their modern counterparts would be in the amount of fencing. Nineteenth-century and early twentieth-century farms were much more heavily fenced and subdivided than they are today. Types of fencing ranged from the traditional "worm" fence, to post-and-rail fencing, to picket fencing closer in to the house. As late as 1875 the state agricultural society estimated that two-thirds of the farm fencing in the state was the traditional worm type.[42] A report in

[41] Houghton, 17

[42] Cited in Fletcher vol. 2 p. 72. Architectural historian Jerry Clouse notes: An article titled, "Statistics of Fences in the United States" in the 1871 *Department of Agriculture Report* noted that of the type of fences

1876 about Centre County farms stated that "the plan most generally pursued by Centre County farmers to-day consists in the subdividing of farms into a number of fields containing from eight to ten, or twenty acres, and in raising upon these fields certain different crops, succeeding each other in a rotation occupying from four to seven years… the plan further consists… in a system of pasturing stock upon the fields, which necessitates the separation of these divisions by means of interior fences to protect certain growing crops from the encroachments of the cattle." This particular critic (John Hamilton of Pennsylvania State College) detested the fencing system, saying that Centre County farms if viewed from the mountain would show "the vast net-work of fences that covers the surface, dividing into all imaginable shapes and sizes, the territory that lies before us… [farmers' lands] are not only separated by fences from the property adjoining, but are themselves divided by interior partitions, until in some instances the homes are so shut in from the highways by gates and bars and barricades, and cut off from neighbors by fields and lots and pens and yards, and similar enclosures, as to remind one of the Labyrinths of Ancient Crete."[43]

reported in 30 PA counties, two-thirds were the zigzag “Virginia” style worm fence, one-sixth were post and rail, one-eighth were boards, and the remainder stone wall, osage-hedge, stump, pole, or other kinds. Historic views indicate that different types of fencing were used for particular areas of the farm. For example, a picket fence may enclose the house and garden, a post and rail fence enclose the barnyard, and a worm fence the farm fields. These figures were recapitulated in the First Annual Report of the Pennsylvania State Board of Agriculture, 1877, 238.

[43] John Hamilton, “Fences,” 1876 Transactions of the Pennsylvania State Board of Agriculture.

This early twentieth-century photo from Juniata County shows several types of fences; a field divided by treelines; a Pennsylvania barn; a probable abandoned field in the foreground; and many dwellings that are probably four-over four types. Juniata County Historical Society site http://www.rootsweb.com/~pajchs/East_Salem2.jpg accessed July 10, 2006

Treelines and Boundaries

Most trees from this period will not have survived, but in some areas the present treelines mark the original property boundaries as laid out in early land divisions.[44]

1880-c1920: A High-Powered Feed Grain and Livestock Economy

During this period, agricultural competition intensified. By this point, the Midwest had achieved dominance in wheat production, so eastern farm families found it more and more difficult to grow wheat unless their circumstances were exceptional. They responded by adjusting, and particularly by finding new markets close by. In Pennsylvania, the burgeoning industrial areas provided these markets, made accessible by rail through most of the state. Farm families in the Central Limestone Valleys found themselves able to ship their products to the coalfields and the cities. They kept the basic

[44] Douglas Macneal, "Introducing Edward Heary's Connected Warrants Map of Centre County," *Centre County Heritage* volume 31:1 (1995); Macneal, "The Potter Landscapes," *Centre County Heritage* volume 34: 1 and 2.

elements of the grain and livestock economy, but instead of selling wheat, and feeding animals and driving them out on the hoof, they increasingly fed animals right on the farm (steers, milk cows, chickens, hogs) and marketed them nearby via the rail network. The list of farm products remained highly varied, and neighborhood exchange networks continued to function.

Products, 1880-c1920

The total number of farms reached a peak sometime between 1910 and 1920, while the average farm acreage dipped to about 100 acres. During this period, an important shift took place in production patterns. The production proportions of wheat and corn flip-flopped. By 1880, feed corn had overtaken and surpassed wheat as the major grain crop. Rye dropped out of sight. Oats remained about the same in terms of importance. Hay commanded much more importance as a cash crop, now that it was easier to move.[45] Milk cows gained in relative importance, but steers remained popular. In general, Central Limestone Valleys farms still raised large amounts of crops and livestock compared with the rest of the state, especially when we consider that farms were smaller.

This new economy was described by the early county agricultural extension agents. In 1917 the Mifflin County agent reported that "One end of a big limestone valley in the County is especially adapted to steer feeding. There is no pasture land here. All the land being tillable, and to pasture on this heavy limestone soil is a bad practice, consequently dairying is not especially adapted. Also it is a very good corn growing locality which is a most necessary requirement where steers are fed. The farmers her [sic] are dutch and a class of people who are interested in cattle feeding."[46] He also noted that in the county as a whole, "Most farmers keep from six to eight cows and as a rule make butter." Creameries appeared in some localities, for central processing of butter, but farm made butter still predominated. Where local markets permitted, truck gardening also was practiced.[47]

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[45] See the following for indications of hay as a cash crop: *Centre Reporter* July 19, 1900, Jan. 26, 1905, 3/16/05, 11/24/1910; for home dairying, see *Centre Reporter* March 1, 1900 (want ad for dairy workers).
[46] Penn State Agricultural Extension Archives, Mifflin County, 1917 Annual Report. PSU Special Collections. The *National Stockman and Farmer*, January 17, 1889, 779, noted many Blair County farmers fattened beef animals. See also July 2, 1891, 259; November 23, 1893, 767.
[47] *National Stockman and Farmer*, September 17, 1903*; National Stockman and Farmer*, January 17, 1889, 779, mentions selling truck to Altoona.

Labor and Land Tenure, 1880-1920

Patterns of farm labor and land tenure did not change in their essentials from the previous period. The Central Limestone Valleys continued to have a high tenancy rate, and farms continued to be far more highly mechanized than the average Pennsylvania farm. Both family and wage labor were common.[48] Many agricultural observers believed that Pennsylvania's rapid industrialization created a labor supply problem on the farm.[49] By the turn of the century a full-blown horse- and steam-power agriculture was the norm. Henry Meyers's 1892 estate proceedings mention (besides plows and cultivators and wagons) a fanning mill, straw cutter, hay rope and pulley, spring harrow, corn planters, cultivators, hay rake, Osborne self-rake, mower, wheat binder, and steam thresher. A Blair County farmer reported in 1887 that "more than fifty self-binders sold in this valley during the season."[50]

Buildings and Landscapes, 1880-1920

There was a great deal of continuity from the previous period, especially with regard to houses and most outbuildings. So, for housing and outbuildings not expressly mentioned in this section of the narrative, please refer to the descriptions in the previous section. However, several important shifts occurred which had implications for buildings and landscapes, and so these changes are described below.

Barns, 1880-1920

Late in the 19th century and early in the 20th century, farmers in the central valleys began to add large wings onto existing Pennsylvania Barns, and even to build new barns in an "L" shape.[51] These barns sometimes forced interior adaptations to the conventional Pennsylvania barn plan. On the upper (bank) level, the threshing floor often faces the extra gable, so if the barn is "L" shaped, the floor would be on the extreme right or left rather than in the center as in the standard Pennsylvania barn. The haymows and machinery storage are displaced accordingly. In the new "ell", on the upper level there's the straw

[48] See for example, the Theodore Christ Papers, Book 131, p. 102, April 2, 1894, entry for hiring a laborer for $16 per month, house rent; wood for one stove; cow pasture for one cow; and one load corn fodder. PSU Special Collections.

[49] *National Stockman and Farmer*, July 14, 1887, 250; May 31, 1888, 137.

[50] Henry Meyers estate papers, Centre County Historical Library, Bellefonte, Pennsylvania. *National Stockman and Farmer*, July 4, 1887, 250. *National Stockman and Farmer*, October 29, 1903.

[51] The *Centre Reporter* in the early 1900s frequently reported that local farmers were adding large extensions to their barns, whereas in earlier years there was little or no mention of such activities (even though other agricultural activities were well noted). See 1/26/05; 6/1/05; 6/29/05; 1/27/1910.

storage place and the granary (which in the Pennsylvania Barn used to be in the forebay or sometimes on the bankside). Like their predecessors, three-gable barns could have multiple granaries, floors, and mows.

Geographer Alan Noble interprets these as "raised three-gable barns."[52] He argues that when machine threshing made it possible to process all the grain at once, (rather than in dribs and drabs throughout the winter), there was no longer any need for threshing doors, so a large wing at right angles to the main barn accommodated the huge piles of straw, which now were carefully sheltered instead of being stacked in the yard. The loft was used for hay, the basement for livestock or manure.

The evidence for Noble's explanation for the emergence of the three-gable barn is mixed. It is true that steam-power threshing and winnowing could produce large straw stacks quickly, and thus make a straw shed useful.[53] However, on the other hand, per-farm census figures actually show *decreases* in the number of steers and in wheat production, and historic photos and accounts suggest that straw stacks in the yard were still very common.[54] (Of course, average figures may obscure patterns that held for larger-scale operations.)

The rise of straw sheds makes more sense if we take other factors into account. Chief among these is the more competitive and capitalistic economic environment that developed during this period. Sheltering animals made a bigger difference to the bottom line than had been the case earlier. So, it seems likely that the raised three-gable barn represents a shift in the livestock feeding economy. Straw for bedding was critical to animals' comfort and productivity, so providing shelter for straw in sheds suggests a more systematic approach to feeding and housing animals. In southwestern Pennsylvania, storm sheds also appeared even as per-farm herd size stagnated or decreased, and there too, the explanation for greater investment in shelter seems to be that farm families sought to increase their animals'

[52] Conversation with Alan Noble.
[53] Threshing machinery was available in the valleys in the mid-nineteenth century, but it was horse-powered and not always with winnowing capabilities. Separate winnowing machinery was available, but it worked on a small scale. It's likely that the change in barns was prompted not by horse power threshing but by the later, faster and more productive steam power that not only threshed (that is, separated the grain from the stalk) but also winnowed (separated grain from the chaff), thus eliminating the need for the cross ventilation that earlier facilitated wind-power winnowing.
[54] Note also that the Houghton thesis, 1911, mentions in most cases a straw stack in the barnyard; but he had an agenda, too.

productivity through protection and feeding. Thus we should trace the rise of the storm shed not to increasing herd size, but to the drive to increasing herd productivity.

Brush Valley Road, Centre County.

Three-gable barn, Linden Hall Road, Centre County.

Three-Gable Barn, Gregg Township, Centre County.

Taylor Potter barn, Potter Township, Centre County,
interior of straw shed. Note the centrally located granary.

Steam power threshing, Juniata County, no date. In this case the straw pile (at left) is outside.
Note cleared fields and woodlots in background. Juniata County Gen Web site.

Spring House, 1880-1920

The spring house's function remained the same, but materials might change. Concrete block became more popular.

Spring house, Rhoneymeade,
Harris Township, Centre County

Corncrib, 1880-1920
The classic long, shed-roof corncrib became a familiar sight during this period.

Corncrib, Long Lane, Centre County.

Ice House, 1880-1920
The function of the ice house remained the same. The examples found in fieldwork date from the late nineteenth and early twentieth century.

Ice house, Boalsburg, Centre County, early 20th century. This one housed ice in the portion behind the blank wall, and cool storage behind the window. Note ventilation and access doors. Construction is thick, straw or sawdust insulated.

Long Lane, Centre County. This outbuilding has the blank walls and raised foundation that might suggest an ice house.

Landscape Features, 1880-1920

Many landscape features (siting, farmstead layout, fencing, woodlots, field patterns, ornamental plantings, treelines) continued from the previous period. It is likely that windbreaks and some ornamental plantings became more common during this period, as Progressive Era proponents recommended them.

Postcards of Penn's Valley, early 20th century. Significant features include: square-ish field shapes; clear tree lines; isolated shade trees; woodlots; utility poles

Shelter Plantings

In the late nineteenth and early twentieth century, there was increasing interest in tree plantings as a means of providing protection and profit. Windbreaks were popular. They consisted usually of close-planted evergreens with a straight narrow habit.

Smith/Durst farm, Centre County. The windbreak at left was planted early in the twentieth century.

Fencing

Wood fencing gave way to barbed wire by the 20th century, and then barbed wire was supplanted by woven wire.

Centre County photograph, Edwin Rosskam, 1941. "Wheat Field Near State College, PA." Farm Security Administration photo. Digital ID fsa 8b14632. This shows woven wire fencing with a single strand of barbed wire at the top; a grain field; large shade trees marking the house site; and a three-gable barn.

1920-1960: Continued Reorientation of the Livestock Economy

In this period the Central Limestone Valleys became "captured" into the eastern urban milksheds. This prompted a shift within the local agricultural economy. General farming continued, but many if not most farms began to produce some fluid milk for outside markets. The same urban areas furnished markets for poultry, eggs, and meat. While some farms became "specialized" in their commercial operations, most did not; and all retained the varied subsistence base right up to the mid 20th century.

Products, 1920-1960

Though the global agricultural depression had plagued farm families since 1920, the opening of fluid milk markets represented a new opportunity in the Central Limestone Valleys. The advent of refrigeration, the road system and the trucks that plied it, the widespread acceptance of milk as a good food, the expansion of urban markets, the consolidation of the market economy, the need to shift production as Western competition reduced the viability of the east's grain and livestock economy, the loss of hay markets with the gasoline powered revolution in transportation and work power – all of these factors pushed farm families all along the East Coast to increase their attention to fluid milk production and poultry raising.

By about 1930, most of the Central Limestone Valleys were incorporated into urban milksheds. As the milksheds extended, farm families increased their production of fluid milk, at least in proportion to other livestock enterprises such as stall feeding for beef. Typical dairy herds averaged seven to twelve cows. The number of dairy cows in the region increased about 25% between 1890 and 1930. In 1923, for example, the Mifflin County agricultural extension agent reported that now "practically every farmer has a small herd of cows that he considers one of his main sources of income." The milk went to new milk plants recently established in the vicinity. Centre County entered the New York City milkshed in the mid-1920s, when dairy plants were opened in the county. However, it took quite awhile before farm families began to switch over to dairying in large numbers.[55]

[55] Mifflin County Agricultural Extension Agent's Report, 1923, p. 3, p. 9; 1926, p. 10; Centre County Agricultural Extension Agent's Report, 1929. Though Centre did have smaller fluid milk markets earlier: Centre County 1922 and 1924: They are outside the NYC milkshed, but have a "fairly good market for milk at the Western Maryland Dairy Plant in Bellefonte"

In the Central Limestone Valleys, levels of specialization were far from extreme.[56] So, in 1929 Pennsylvania State College agricultural economists reported that the "rich limestone valleys" supported a "wide variety of crops," and that while "this area is a recognized part of the Philadelphia milk shed," … "general farming is the second most predominant type."[57] Overall farm production was still quite diversified in comparison with what came later. So – farm families received an ever-increasing proportion of income from dairy and poultry as time went on; but throughout this period they still also sold a variety of items (including fruit, hay, potatoes, cannery crops, hogs, etc) to round out sales. Especially during the Depression, farmwomen substituted labor for purchases, thus the work of canning, pickling, drying, gardening, etc. still took a prominent place. By 1946, the Central Limestone Valleys were characterized (again by PSU agricultural economists) as falling within the "Dairy and General Farming Section." They sent milk to the New York and Philadelphia markets, but also showed a strong diversification.[58] For example, in 1945 the Snyder County extension agent reported that "Snyder County ranks third in the state ... in acreage and production of black raspberries."[59]

Poultry and Poultry products: Particularly during the Depression, when milk prices sank to unprofitable levels, farm families engaged more seriously in the poultry business. They raised poultry for eggs; for meat; and some raised chicks in hatcheries, to be sold to farms. The Centre County agent reported in 1934 that poultry was the second most important source of farm income: "the poultry business has developed to a great extent through the encouragement of local hatcheries to the farmers in the county to go into poultry as a cash crop. These hatcheries pay a premium from 5 cents to 8 cents a dozen for hatching eggs, starting usually around the first of February and during the spring months until June. This practice in addition to the higher fall egg price makes it possible for poultry to pay some profit. During the past year with extremely low feed costs poultry has perhaps paid more profit than any other agricultural industry in the county. The marketing situation is fairly well taken care of through the hatcheries and outside

[56] Union County Soil Survey of 1946 estimates that 200 farms specialized in field crops, 391 in dairy, 80 in poultry, 24 in livestock, and 289 "farms on which the products are used by farm households"
[57] "Types of Farming," 1929
[58] "Types of Farming," 1946. This report says that poultry is comparatively less important than the state average, yet the map shows at least some townships with both dairy and poultry as specializations; plus it seems as if there was a lot of poultry in the postwar period.
[59] Snyder County Agricultural Extension Agent's Report, 1945, 6.

buyers."[60] By 1943, the agent noted that most flocks numbered between 200 and 500. Snyder County farm families also sold eggs to local hatcheries in the 1930s.[61] By 1950 in Centre County, many farmers were raising hatching eggs to sell to a Delaware company that picked up twice a week. Turkeys were another poultry enterprise. The Union County agricultural extension agent reported: "Five years ago it was almost impossible to find turkeys on farms in Union County. During the year 1932, flocks varying from 5 to 500 birds were raised."

The farm garden assumed more critical role than ever during the Great Depression. Farm women "made do" by substituting labor for cash outlay. The Centre county extension agent reported in 1936 on a garden project, in which participants tried new varieties of broccoli, Brussels sprouts, cabbage, and others; a photo at Mrs. Yearick's showed men, women, and children in attendance.[62]

Labor and Land Tenure, 1920-1960

It seems as if the increased capitalization requirements and trend to dairying probably made wage labor more important. Work patterns were less seasonal, especially in dairying, which became more of a year-round activity. There were important shifts in women's labor as farm buttermaking diminished (but did not entirely disappear until late in the period). With the rising activity in poultry raising, men entered into this work – both male extension agents (poultry raising was considered part of agricultural extension, not home economics) and farm men. The gendered assumptions of the extension agent are notable: he wrote in 1921 that attendance at poultry demonstration had doubled, and 'we were interested to note the much greater proportion of men attending indicating increased interest in poultry" -- as if "interest" only counted if it came from men. But photos show that women's interest and participation were strong.

Farm tenancy continued in importance, with the proportion remaining about the same or even rising slightly. In areas that shifted to dairy production, leases became a problem. The Mifflin County agent reported in 1926: "One third of our farms are tenanted. The

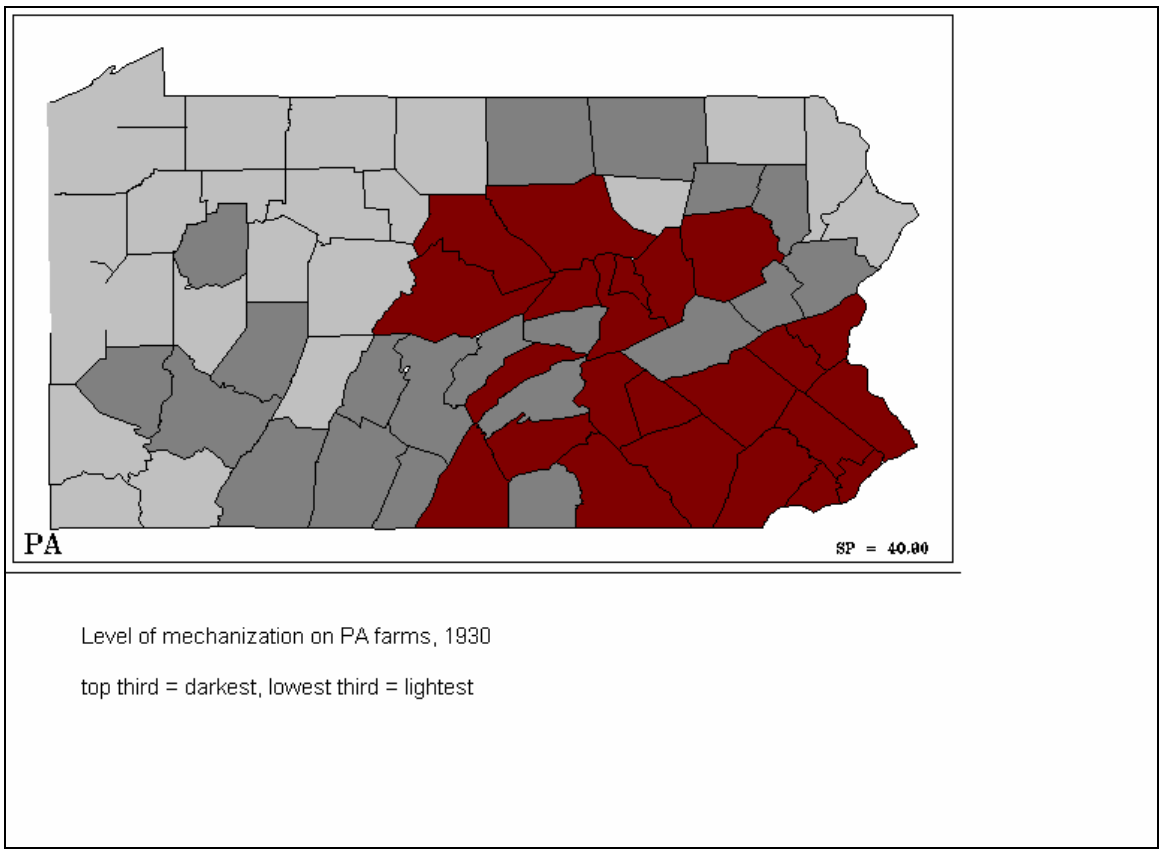
[60] Also, McIntire's 1940 thesis on 1931 farm management practices reported that there were large hatcheries selling to hucksters from NY and NJ and that the hatcheries eliminated a lot of home work.
[61] Centre County Agricultural Extension Agent's Report, 1934, 16; 1948: A flyer for the Centre County Bakers Farm Tour mentions Stop 1 at George Peters' and Roy Kuhn's farm, which featured 5,000 New Hampshire Red baby chicks in his new poultry house.
[62] See also Juniata County Agricultural Extension Agent's Report, 1938.

antiquated one half share of crop lease is the universal contract. It has outgrown its usefulness as every landlord and tenant knows or should know. Grain farming alone no longer pays. Livestock farming combined with grain farming is where money is to be made. Under the present contract the landlord is still trying to make ends meet from the grain farming which cannot be done, and the tenant has found he can make a little money with livestock if his landlord will let him, which he won't in most cases."[63] Penn State workers drafted and publicized new lease forms that provided for payment of rent based on the milk check, rather than on shares of grain.[64]

Levels of mechanization continued to be high. The most significant development of this period was the rise of gasoline power. This had profound effects. Of course (in most of the valleys, with the possible exception of the Big Valley Plain sect minorities) this meant the gradual disappearance of horses and their replacement with gas powered tractors. In turn, that meant the reduction of oats in crop rotations, thus freeing up acreage for other field crops or hay. This process was quite drawn out, only really ending well after World War II; there was a period of overlap. There were shifts in gender patterns of labor, for example in the North generally, women did more driving on errands. However, the auto enabled rural people to engage in more social contacts, and it often led to shifts in the definition and pattern of rural neighborhoods. Some rural crossroads stagnated, while rural villages become retail centers. On the farm, some formerly communal or shared labor disappeared, but other types appeared, for example silo filling.

Other new forms of technology appeared in rural American during this period, including electrification, telephones, etc. Electrification was primarily used for lighting in this period; this applied to the home, and also often to the barn, thus easing milking during the short days. The 1927 census shows that these were rare on all Centre County farms. Only with the REA and the wartime economic boom did these amenities reach rural areas in the limestone valleys. Possible impacts on landscape would include utility poles and lines; increasing size of dairy herds and shift in gender division of labor due to availability of milking machines and barn lighting; and the decline of outbuildings such as the summer kitchen and spring house, as electrical refrigeration became more widely available.

[63] See also Centre County, in 1933 Ag Extension Agent's Report, on the same lease problem
[64] Union County Soil Survey, 1946, stated that most farms were rented on a "50-50 crop basis"



Level of mechanization on PA farms, 1930

top third = darkest, lowest third = lightest

Buildings and Landscapes, 1920-1960

Houses, 1920-1960

New housing in this period was relatively rare, owing to the severity of the farm depression. What few new houses were erected on farms tended to draw from nationally popular forms such as the foursquare. This represents a shift away from the regionalism that had been so predominant earlier.


Foursquare house, Black Hawk Road, Centre County

Barns, 1920-1960

The most important story here is the conversion of the barn for dairy purposes. This occurred in response to sanitation requirements imposed by the markets to which fluid milk was sent. The process was not instantaneous; it took at least 10-15 years. For example, in 1938 (a dozen years after the Philadelphia milkshed reached there) the Mifflin County agent reported: "most farmers are remodeling their dairy stables…. they are required to do this if they sell to fluid milk dealers." "The old bank barns are being made into modern dairy barns" and plans are distributed.[65] In Centre County, renovations were still being made as late as 1948: "there was more remodeling of dairy barns where the entire inside of the barn had to be torn out and a modern stable built. In many cases, the overshot of the barn was eliminated and a new wall built flush with the barn so that the stable could be wide enough to stanchion two rows of cows. The construction of many new milk houses is evident to a person driving through the county. Advice on remodeling problems was given to 32 people."[66]

These renovations may include any or all of the following:

<u>On the stable level</u>:

- concrete floors replace dirt,
- metal stanchions of various types replace wooden restraining systems,

[65] Mifflin County Agricultural Extension Agent's Report, 1938, 19, 30. In Clinton County they didn't begin mentioning health regulations until the mid 1940s.
[66] See also detailed descriptions in the Clinton County Report for 1947.

- feed and litter alleys are reoriented: Usually lengthwise arrangement of dairy stanchions substitutes for crosswise arrangement of box stalls,
- addition of windows, possibly through excavation of bank, or enclosure of forebay,
- enlargement of existing windows,
- extension of stable space,
- omission of space for horses (some markets banned housing horses and cows together),
- evidence of whitewashing,
- evidence of ventilation shafts,
- litter carrier systems; installation of electricity (artificial light, later milking machinery, fans),
- relocation and closing of hay chute,
- and placement of stalls near light source.

On the mow level:

- re-framing to accommodate hay track and other loading devices (though after the late 19th century, many barns were built with hay tracks already installed),
- re-location of hay chute,
- addition of access from silo,
- holes cut in the gable end doors to load hay,
- and, the elimination of drive floor use as machinery storage in favor of more hay storage. In general, the upper level is less altered than stable level.[67]

[67] "Suggestions for the Improvement of Old Bank Dairy Barns," USDA Circular # 166, June, 1931.

Black Hawk Road, Centre County. This picture illustrates some of the key changes of the 20th century: poured concrete and concrete stave silos; three gable barn altered for dairy (note the windows cut into the lower level); pole barn (post war); foursquare house.

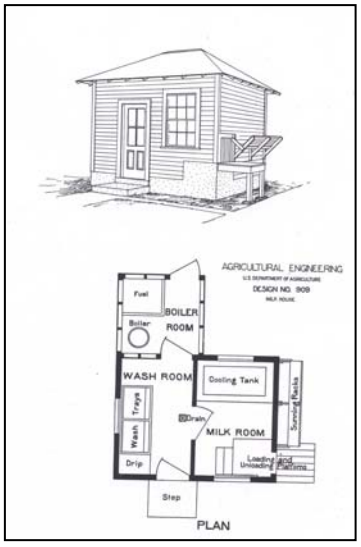
In the post World War II period, the *pen barn* or free stall barn became more highly recommended by agricultural engineers. A ten-year research project at the University of Wisconsin confirmed that cows actually did not need heated quarters; as long as they were protected from winds, they did as well as cows in more conventional barns, and often they did better. The pen system was recommended to replace the stall-and-stanchion type of arrangement. The advantages of the pen system involved saving on labor and construction costs. When not being milked, cows roamed freely in a large open space with dirt floor and ready access to hay or silage. At milking time, the cows were trained to walk into a separate milking parlor, where they ate feed concentrates while being milked, then proceeded straight ahead back into the pen or pasture. This saved on labor costs in feeding (the animals fed themselves in the pen, and were fed concentrates simultaneously with milking) and stable cleaning, and it saved construction costs because the pen barn lacked expensive stanchions and full concrete floors, and was less well insulated. Cows had fewer injuries from missteps in the concrete stanchion area. The pen barn system incorporated milking parlor, and often the milk house then adjoined the parlor.[68] Very often, the pen barn was made of pole construction, also an innovation in

[68] H. J. Barre and L. L. Sammet, *Farm Structures* (New York: Wiley, 1950), Chapter on "Dairy Buildings;" University of Wisconsin College of Agriculture June 1953 Bulletin titled "Loose Housing or

the postwar period.[69] Fieldwork did not locate these types of barns in the Central Limestone Valley – at least not any that could be definitely dated to the period before 1960.

Milk House, 1920-1960

In 1923, the county agent reported, "one of the most important developments in the dairy industry in Mifflin County this year was the program of Sanitary Regulations instituted by the Philadelphia Dairy Council through the Inter-State Milk Producers Association under which organization the producers here are organized. These regulations require the milk producer to put into effect some simple, practical measures such as keeping the milk in a modern milk house, covered milk pails and sanitary stables. By 1926, a "special milk market has been opened up to the producers already in two townships that have been [tuberculin] tested and cleaned up. Grade A TB tested milk is now being shipped out of this community to Philadelphia and pays a bonus of 20 cents per hundred to the producers."



The milk house was a major new form on the 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.[70] These regulations

Stanchion Type Barns for Dairy Cattle" noted that while loose housing is relatively new in many areas, its many advantages now make it well worth considering when a new barn must be built or an old barn remodeled.

[69] Roger A. Grout, "Construction of Pole-Type Buildings," Penn State Agricultural Extension Circular # 437, November 1954; William Gilman, "A Barn They Drive Miles to See," *Farm Journal* July 1952: 32-33 (this describes a New York State open stall dairy barn setup).

[70] 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, 29-34. Although note that Houghton's thesis mentions 7 of 25 farms having milk rooms, 6 by 8 and some were actually inside the barn.

were a facet of the assault that was launched on bovine tuberculosis and other diseases in this period, aiming at ensuring a fresh, uncontaminated milk supply. In order to market milk, increasingly farm producers had to comply with regulations that required them to install easily cleaned surfaces (like concrete) in barns, remove milk storage areas from dirt and odors (by building milk houses), cool milk, and the like. In the central limestone valleys, these structures did not appear until the valleys joined the urban milksheds, until the mid 1920s at the earliest,[71] and later in most places. The milk house's 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).

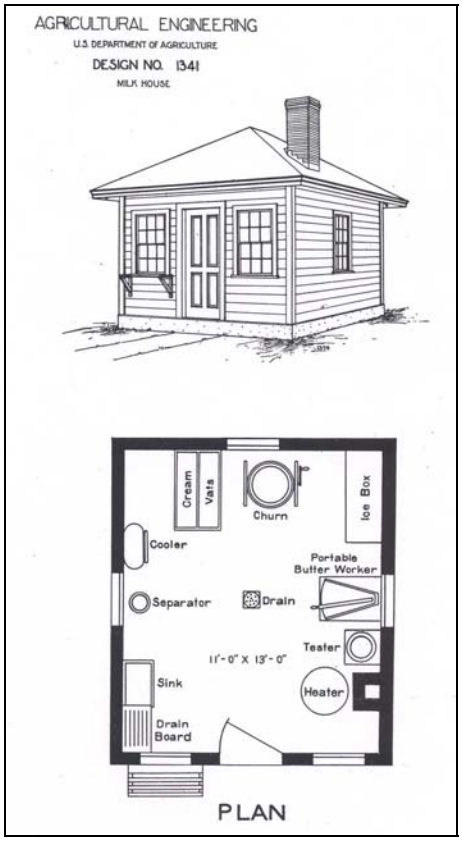
Milk houses provided a place to store and cool fluid milk before it was transported to market; to store milk cans not in use; and to wash containers and other equipment like separators). Plans offered by the USDA for farm milk houses typically gave dimensions ranging about 10 x 13 feet up to around 12 x 20 feet. Interior plans for a 10 x 13 milk house with ell (# 909, "capacity 20 to 30 head market milk") show a two-room plan with door leading to a wash room; milk room to one side, which contained a cooling tank and led to raised loading/unloading platforms and sunning racks, mounted on the outside. The ell contained a boiler room[72] with its fuel supply, and back door. Larger milk houses had the same basic three spaces, only larger, and sometimes equipped with testers for butterfat and separators[73]. One (#1337) had a churn, butter worker, ripening vat, and refrigerator, and another (#1339) had quarters for workers. Another small, 12 x 14, one-room milk house (#1341 see illustration) was designed for "butter making by hand" for 20 cows. It contained the same basic spaces, but not divided. The very smallest, at 7 x 9, had a concrete foundation with a sunken vat for cooling cans of milk. All of these plans had sloping floors with drains, and provision for ventilation and light. Actual milk houses on farms tend toward the smaller end of this range. Though the USDA models were frame, most farm milk houses observed in the Central Limestone Valleys were

[71] Centre County 1924 Ag Extension Agent's Report: "the Sheffield Farms Milk Company recently opened a milk plant at Howard and also purchased the Western Maryland plant at Bellefonte. This milk in order to be sold on the NY market as grade "B" must meet certain standards. This has necessitated several changes in the barns in this territory as well as some system of cooling which has resulted in a number of milk houses being built."

[72] Circular 107 says the boiler would be needed where "the herd is large and milk is to retailed."

[73] Separators would be for on-farm buttermaking during the off-seasons when plants weren't collecting.

constructed of masonry. Rock face concrete was popular before about 1930, and then hollow concrete block became the norm.[74]



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

[74] Circular 107 says an 8 by 8 house would "do for a dairy of 10 cows."

Milk house, Rhoneymeade, Centre County.

Rock face concrete milk house with pyramidal roof, Manor Road, Centre County. Note location by main road and farm drive; also three-gable barn in background.

Concrete block milk house, Middle Road, Centre County.

Milk house adjacent to barn on farm drive, Heckman Cemetery Road, Centre County.


Milk house adjoining barn, at farm lane, Long Lane, Centre County.

Location
The milk house, Alan Noble reports, was usually quite near the barn; though other locations have been observed between the house and barn, or near the road.[75] On some farms, ice was used for cooling, in which case the milk house and ice house would often adjoin.

Machine shed, 1920-1960
As barns filled up with livestock, hay, and straw, machines got pushed out into separate structures. The Pennsylvania State College Agricultural Experiment Station reported in 1929 that in Centre County 88% of farmers housed all their machinery; 81% owned a

[75] Noble, conversation with Author; Hall, 1929, 62-3, argued for a location near the stable entrance but with no "direct opening to the stable." He says the house should have running water and a tank sufficiently sized to cool two milkings' worth, below floor level. He recommends a roof ventilator. The PSU Circular #107, "Building the Farm Dairy House," date unknown, also mentions proximity to water supply, wind direction vis-à-vis dirt roads, and drainage.

machine shed and 47% owned a repair shop. (This is only of selected surveyed farms, so actual percentages of total farms were probably lower.)[76]

Gable-entry combination machine shed and corncrib,
Lewis Township, Union County

Gable-entry machine shed, McCullough's Mills,
Juniata County, no date. Juniata County Historical Society site.
http://www.rootsweb.com/~pajchs/mccullochs_mills.jpg,
accessed July 10, 2006

[76] Josephson, H. B., et al. "A Farm Machinery Survey of Selected Districts in Pennsylvania," Pennsylvania Agricultural Experiment Station Bulletin # 237, 1929, 5.

Garage, 1920-1960
As cars and then trucks gained a foothold in the countryside, garages appeared too. Farm families acquired cars and trucks quite rapidly and so early garages were made of rock face concrete, concrete block, or frame construction.


Garage, manor road, Centre County.

Silo, 1920-1960
A silo is an airtight structure that holds fresh organic matter (moisture content 50-65 percent) destined for winter animal feed. It is filled with shredded or chopped grass, corn, or sometimes other plant material, which ferments into a highly nutritious feed. Silage feed resulted in significant productivity increases for dairy cows, and also permitted marginal farms to carry more animals. Ensilage was first publicized in the late 19th century when the results of experiments in Europe became known in the United States. However, it did not become widespread until dairying was taken up more seriously. Since the Central Limestone Valleys turned to dairying relatively slowly, silos

were not as common there as they were in the more specialized Northern Tier grassland region. While wood stave silos are common in the Northern Tier, they are rare in the Central Limestone Valleys, because the wood stave type is the earliest.[77]
Silos can be constructed horizontally, in pits, or vertically. Today, horizontal, plastic-covered silos are very common in the Central Limestone Valleys. But 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.[78] 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 roof) and unloading (either from a tier of successive doors from which silage was thrown down an exterior chute, which contained a ladder for access to the doors, or from the bottom). The land-grant establishment published many "how-to" brochures aimed at helping farmers build their own silos of wood or concrete.[79] Because masonry is more durable, cheaper, and cleaner, it became the norm. Commercial organizations marketed many types of silos too. Some sold special curved brick; others made tiles;[80] still others advertised systems depending on interlocking rings of poured concrete. Cement staves became popular after about 1910. Galvanized iron was mentioned by Hall, 60, 1929.[81] The literature on silos from the 1920s shows all of these types, so it is difficult to date silos based on type. But the concrete stave type endured into the 1970s while the other types fell into disuse after the 1940s. Geographer Alan Noble discusses various roof types, and argues for a sequence from gable to cone to hip to dome to hemisphere.

[77] Norman Dale, "Agriculture in Susquehanna County, Pennsylvania," MS Thesis, 1932, 9. Figures for 1924: 12% of Centre County farms had silos; 9% for Clinton County; 6% for Juniata and Mifflin; 5% in Snyder; and 14% in Union County. Statewide the average was 13 percent.
[78] Houghton notes that of the 25 farms surveyed only 5 had silos, and these were wooden staves, 8.
[79] More to integrate: wooden hoop silo, farmers bulletin #1820. Some of the ones in this bulletin have chutes, always positioned over a lower door, and some don't (1918 Centre County Agricultural Extension Agent's Report, field tour of silos including wood, concrete, and tile structures).
[80] Clinton County Ag Extension Agent's Report reveals that in the 1930s tile silos were built in the county by the owners of tiles produced locally; in the 1940s, brick ones were more popular.
[81] I.F. Hall, 69.

Concrete stave silo with dome roof,
Gillilland Farm, Centre County.

Concrete stave silo with hemisphere
roof and metal chute, Rhoneymeade.

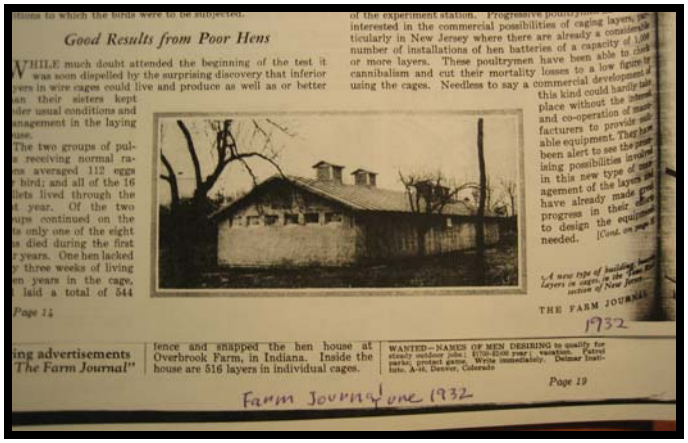
Poultry Housing, 1920-1960

General Developments in Poultry Housing

In general, poultry housing in the twentieth century responded more and more to developments initiated by the agricultural establishment, whether the extension system, agricultural research universities, or agribusinesses marketing mass-produced equipment. For example, home-scale incubators and "brooder stoves" were advertised and illustrated in the farm press in the 1920s. The incubators were heated box like affairs mounted on

legs. The brooder stoves had a central heat source (sometimes an oil burner), which warmed a protective, usually conical hood under which the chicks could huddle. It is not clear where these devices would be set up, but advertisements usually featured women making testimonials, which suggests that this equipment might be set up near or possibly even within the farmhouse.[82]

By the 1930s, "battery" brooders were appearing where larger numbers (over 500) of chicks were raised. These consisted of stacked cages with "wire-mesh floors with dropping-pans underneath and water- and feed-hoppers on the outside."[83] Proponents claimed many advantages over the traditional brooder house, especially lower cost of building, the ability to keep many more birds in a smaller space, and lower labor costs.[84] Notably, one author pointed out that "battery brooding will produce good birds without much experience on the part of the operator…"[85] The shift to less-skilled labor probably occurred as men took over poultry raising, and also as sheer numbers rose. The buildings in which batteries were housed often were indistinguishable from other types of poultry houses; but some purpose-built battery houses were built which were characterized by high windows around the perimeter walls. These permitted batteries to be ranged along the walls, and light to enter from above. No field examples of this type were encountered in this study.



Good Results from Poor Hens

WHILE much doubt attended the beginning of the test it was soon dispelled by the surprising discovery that inferior layers in wire cages could live and produce as well as or better than their sisters kept under usual conditions and management in the laying house.

The two groups of pullets receiving normal ra- tions averaged 112 eggs per bird; and all of the 16 pullets lived through the first year. Of the two groups continued on the test only one of the eight pullets died during the first two years. One hen lacked but three weeks of living seven years in the cage, and laid a total of 544

Page 14

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

[Cont. on page 6]

THE FARM JOURNAL

1932

ng advertisements The Farm Journal"

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

WANTED—NAMES OF MEN DESIRING to qualify for steady outdoor jobs; $1700-$2400 year; vacation. Patrol parks, protect game. Write immediately. Delmar Institute, A-16, Denver, Colorado

Page 19

Farm Journal June 1932

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

[82] For illustrations, see advertisements, *Farm Journal*, March 1922 and January 1922.
[83] C. S. Platt, "Battery Brooding," *Farm Journal*, January 1930, 22.
[84] Kennard, "A New Deal for Chickens," *Farm Journal*, July 1933, 5.
[85] Platt, "Battery Brooding."

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

The "battery" philosophy soon extended beyond chicks to adult birds. Articles began to appear advocating batteries not only for brooders and layers, but also for broilers. By the 1930s, the free range philosophy was in decline among the agricultural establishment (i.e. in the farm press, among extension agents, and with agribusiness), though on many a farm range practices continued. *Farm Journal* poultry editor D. C. Kennard wrote in 1932 that "Today the pendulum is swinging toward confinement."[86] Agricultural experiment station testing in Ohio and other states established that confined birds actually did better than those who were raised partly or wholly on free range. An important nutritional discovery -- that cod-liver oil added to the birds' diet helped chicks thrive indoors -- spurred a "revolution in hen-coops." With yards no longer emphasized and

[86] Kennard, 5.

numbers of birds rising, multi story laying houses began to appear, and the new philosophy also encouraged renovations to large barns for poultry.[87] These barn renovations did not necessarily always contain battery cages, but they did illustrate the abandonment of free-range practices.

By the 1950s, the battery technique was modified, because cages stacked above one another had resulted in ventilation and disease problems. Among large producers, cages were retained, but in single rows suspended above a concrete floor, often in a long, low building. Waste pits reduced disease and cleanup problems. Novel construction techniques such as trussed rafters and sheet-metal construction minimized the number of posts and thus created an open, flexible space. Farm magazines also advertised manufactured poultry housing, including conventional shed- or gable-roof structures, but also pointed-arch houses. Prefabricated poultry houses were also discussed in the farm press.[88] However, many farmers continued on a more modest scale and their buildings were correspondingly modest.

[87] C. S. Platt, "Four Weeks in Batteries," *Farm Journal*, December 1930, 11; on continuation of free range practice, see ads in *Farm Journal*, September 1951, 92; D. C. Kennard, "Revolution in Hen-Coops," *Farm Journal*, March 1932, 14; Nathan Koenig, "Henhouses from Left-Overs," *Farm Journal*, June 1930, 31-32.
[88] On new construction techniques, almost any issue of *Farm Journal* for 1958 and 1959 contains ads illustrating them. See also "New pre-fab poultry houses," Buildings column, *Farm Journal*, May 1957.

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

Poultry Housing in the Central Limestone Valleys

The poultry business became more important during this time period. Dairy and poultry were the twin mainstays of farm income. Poultry saved many a farm during the Depression when milk prices hit bottom. In the Central Limestone Valleys, poultry production for eggs and meat, and hatcheries for chick production, were common in this period. However, though poultry raising expanded everywhere in the region, it was more intensive in some places than in others. The Penn's and Brush Valley areas in Centre County had one large hatchery, but otherwise production was on a relatively small scale. Juniata County, however, was a larger-scale poultry center and more poultry-related buildings remain there, especially in areas such as the Cocolamus. Today, the area continues this tradition in a new form as one of the largest kosher poultry producing regions on the east coast.

Large-Scale Hatcheries
Juniata County supposedly had half of the state's hatcheries in the 1930s[89] and Centre Hall also had an enormous one (Kerlin, in Centre Hall, distributed nationwide via rail in the early 20th century).[90] Little information has been located about them architecturally and very little agriculturally.

Brooder Houses (individual farm scale)
Brooder houses provided a warm, safe environment for newly hatched chicks. They can be identified by a stovepipe protruding from the roof, usually had windows as light was also important for chicks. On the interior, they would have water trough, feed boxes, and stove.[91]

Gillilland Farm, Brush Valley Road, Centre County. The long outbuilding with chimneystack and windows could be a brooder house.

[89] *Juniata: A County for All Seasons*, written and compiled for the Juniata County Historical Society 1981, 90, asserts that the county had fifty hatcheries in 1930, which accounted for half the state's total. The Department of Commerce records, Record Group 31, photo # 1422, shows hatchery interiors about 1940.
[90] December 1936: "this week 20,000 leghorn eggs will be placed in incubators on the Kerlin's Grand View Poultry Farm… this business was moved to its present location shortly after 1900." The hatchery employed 24 at its peak season. Shipments of chicks go to all states and 30 foreign countries." Quoted in *A Century of Centre Hall in Pictures*, 1942, 201. The 1930s Community Study of Centre Hall, p 2, agriculture section, says that 250 local farmers (10-15 mile radius) buy chicks and that the hatchery markets both broilers and eggs. Community Program Studies. [archival material]. 1923-1971, Pennsylvania State University, Dept. of Agricultural Economics and Rural Sociology, Item 02494. The Sanborn maps for Centre Hall, starting in 1911, show a "Chicken Ranch" near the railroad depot. (PSU Special Collection)
[91] See Seltzer/Rishel Farm, Potter Township, CCCTS Report 2002.

Laying Houses

The laying house provided nests, perches, feed and water for laying hens. Some purpose-built laying houses were constructed in this period. The Clinton County 1950 agricultural extension report noted: "plans were provided for two 30 by 60 foot two story laying houses. … formerly long, narrow houses were used on these farms." The two story houses cut labor time in half. The old houses "are to be discarded." However, many farm families chose to modify existing buildings, especially during the financially strapped Depression era. Centre County's 1934 report stated: "poultrymen throughout the county have had considerable success in remodeling old buildings for the use of poultry. In many cases a part of straw sheds or hay mows have been closed in, windows cut, and have made satisfactory laying quarters."[92] This was far cheaper than new building.

Pennsylvania Barn and outbuilding converted for poultry, Juniata County, Cocolamus region

[92] Clinton County Agricultural Extension Agent's Report, 1950; Centre County Agricultural Extension Agent's Report, 1934, 16.

Broiler Houses
In most cases, it is difficult to distinguish a broiler house from a layer house from the outside. Inside, the broiler houses do not have nests, so they could accommodate many more birds than the layer houses. This description is from Clinton County agricultural extension agent's report for 1950: "Broiler production is increasing in this area. Two new broiler-producing houses were constructed this past year which will care for 16,000 additional birds. The producers who dressed birds for the local markets were assisted the past year with plans for construction of killing, dressing, and storage plants. Both of these were built in such a way that all the killing would be in one unit, dressing and storage in another unit, with provision for retailing at the farm. These units were built of concrete blocks with cold storage space for at le**a**st 500 birds. Provision was made in the construction for installation of a freezer in the future…"[93]

Free Range Pullet Housing
Pullets (young hens under a year old, before they begin to lay) were sometimes reared on open range pasture, and sheltered in movable roost like affairs. These needed to be movable because the birds had to be on "clean" ground so that they didn't pick up diseases left behind by the last bunch of birds. These houses would often be mounted on skids. Fieldwork did not document any remaining free range housing from the period.

Larger Scale Poultry Buildings
In the Cocolamus region of Juniata County, a larger scale poultry raising industry took root. Multistory buildings remain on the landscape, as do buildings erected as sales sites.

[93] Clinton County Agricultural Extension Agent's Report, 1950.

Multistory poultry house, Kellerville Road, Juniata County.

Graybill Hatchery, Cocolamus region, Juniata County

Corncrib, 1920-1960
Manufactured corn cribs were produced in the early twentieth century, but disappeared during the metal shortages of World War II. They became popular again in


Linden Hall Road,
Harris Township, Centre County.

the post-World War II period. Historian Keith Roe[94] says that metal cribs were adopted because wood and labor prices rose, and also because the metal cribs were study and required little maintenance. Corncribs became less common after the mid-1950s, when harvest technology changed in several ways: combines made it possible to shell corn in the field; and artificial dryers eliminated the need for a long drying period in the crib. In any case, the importance of field corn in Pennsylvania declined relative to the Midwestern corn and hog belt.

Other Outbuildings, 1920-1960
Few or no new summer kitchens, spring house, smoke houses, butcher houses, root cellars were built. However, some did continue in use. Some were likely recycled.

Landscape Features, 1920-1960
Relationship of House, Barn, and Outbuildings
The visual and spatial relationships of farm buildings continued to be strong in this period. The most pronounced visual change was the introduction of architectural vocabulary that was generic, industrial, state-sponsored, national as opposed to individual, hand built, folk-derived, local/regional. So, the new structures that appeared – silo, milk house, poultry house, dwelling – contrasted with the earlier buildings in terms

[94] Keith E. Roe, *Corncribs in History, Folklife, and Architecture* (Ames: Iowa State University Press, 1988), 64.

of texture and form; but they fit with the earlier assemblage in terms of scale, siting, and often finish.

Farm Gardens, 1920-1960

Well into the twentieth century, the farm garden was an important component of the household economy. Tended mostly by the women and children, it supplied fresh food, and of course vegetables for canning, drying, and otherwise preserving for winter use. It was usually sited near the house.

Garden Demonstration, Photo in Centre County Agricultural Extension Agent Report for 1939

Field Patterns, 1920-1960

A notable trend in field patterns emerged during this period. These trends were related to the gas power revolution in farm mechanization. Tractors helped to reshape fields by they encouraging the consolidation of small fields into larger ones, so that the tractor could march uninterrupted up and down long expanses. Fields could also be larger because oats were no longer needed for horse feed. The combination of tractor power and dairy specialization sometimes resulted in an erosion problem. So, the larger fields needed to be cropped in a different way, and this meant contour plowing and strip strip cropping. The evidence suggests that this development did not affect the region uniformly. Much of the land was flat and thus did not present the erosion hazard that severe slopes would bring. There must have been patches where consolidation was taking place, but these would appear among farms that retained their earlier appearance. For example, the Pennsylvania State College Bulletin 237, "Farm Machinery Survey in Pennsylvania," 1936, found that the average size of fields in Centre was 15 acres and the average crop acreage was 87, so from this we can deduce that a farm would have 5-6 fields in crops.[95] This conforms to descriptions reaching all the way back to Thomas Burrowes in 1846 that "farms are generally divided into about six fields…" Probably the six fields of 1936 may have been larger than the six fields of 1846 (because of clearing, not farm size), but there is evidence for a significant level of continuity. Indeed, the Centre County agent reported, somewhat frustrated, in 1943 that "Centre County farmers have followed the system of farming in square fields for generations so that they are slow to revolutionize their farm layout, which is necessary to conform with a good erosion control program." He opined that "means rearranging the fields, eliminating fences, and establishing strips."[96]

[95] Josephson, H. B., et al.

[96] The agent's example of a good practice was Dave Hosterman in Spring Mills which had just rearranged fences to eliminate corners, and also rearranged pasture area

2004 view of square shaped fields from Brush Valley Road, Centre County.

Contour plowing arranges furrows along contours of slopes, thus reducing runoff. The *Farm Journal* in August 1935[97] defined strip cropping as "a form of contour farming in which strips of densely-growing, erosion-resistant crops, such as alfalfa, lespedeza, sweet clover, Sudan grass, timothy, and the small grains, are alternated across the slope with strips of cultivated row crops. The strips of erosion-resistant crops check the speed of the runoff, filter out the soil being carried by the water, and cause the land to absorb moisture." The article also noted that strips demanded less labor than square fields and "permit more efficient use of machinery." They also fit well with terraces.

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

The extension agent's opinion notwithstanding, a comparison between aerial photographs of the late 20th century and the 1930s reveals that eventually, large areas of the Central Limestone Valleys did undergo strip cropping and contour plowing. It is difficult to date these, but most would likely have taken place in the 1950s and 1960s. A patchwork of small, square-ish fields has in many places given way to larger fields cropped in long, sharply contrasting strips. Quite a few treelines and "loafing" trees have been eliminated, as animals were increasingly fed in the barn rather than being pastured. Many if not most earlier boundaries of lots and fields remain, and perhaps twenty percent of fields retain their 1930s size, shape, and treeline.

Farm Ponds

Farm ponds were a popular new feature in the post World War II period. The Centre County agent reported in 1948 that many new ponds had been built and the archives contain photos of both ponds and fence line removal.

Woodlots

The Progressive and New Deal era conservation ethic stressed capitalistic, rationalized forest management. This concept spilled over into agriculture with programs for revitalizing farm woodlots, using woodland for soil conservation, and planting unproductive pasture back into trees. In general, though, woodlots became less important as use of wood for fuel declined. Still, in 1951, the average Centre County farm had 47 acres in woodlots.[98]

Dynamited Drainage Ditches

Dynamiting was one of the most dramatic – and popular – agricultural extension demonstrations of this period. Local people would flock to farms where a ditch was to be blown. In Centre County in 1945, the extension agent reported that 2,000 feet of dynamite ditching was done at J. M. Miller's in Madisonburg.[99] Paul Thompson in Millheim and Charles Smith near Woodward did it too. By 1949, the agent was reporting that "since our original demonstrations, bulldozers have been working continually in different parts of the county on fence row removal, the widening of stream beds, and the removal of rock piles and other obstacles in the fields." He continued: "three magazines are now handling dynamite so that farmers can get it at any time for ditching purposes."

[98] Keller, William Carl. "A Survey of Volume and Condition of Farm Woodlands in Centre County, Pennsylvania," Penn State University Master of Forestry Thesis, 1951.
[99] Centre County Agricultural Extension Agent's Report, 1946, 10.

These activities could have a potentially enormous impact on a single farm's landscape, though it is not clear if there was enough dynamiting to alter the landscape of the entire region.

Shocks and Stacks
Period photographs all throughout this era show shocks of grain and corn. See *Soil Survey of Union County* 1940, Plate 5 for an example. Of course, these are gone today except for the Plain Sect areas.

Fencing
If the documentary record is to be believed, this period saw the removal of a great deal of fencing. What remained would have been new forms of barbed wire, woven wire, and electric fencing. It is not clear whether ornamental fencing around the farmhouse remained.

Utility Lines
Rural electrification came into the valleys during this period, so utility poles appeared along the roadside. Probably not until well after World War II did the entire region have access to electricity in all its remote reaches.

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