History of Middletown

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*Revolutions in Agriculture in Middlesex County, Connecticut during the Mid 19th Century*

Middletown, Connecticut is rarely thought of as a town at the forefront of new developments in agriculture in the United States. However this small city, founded at a prime position at the edge of a historically important waterway, and within one of the most fertile regions of the Northeast, once led the nation in agricultural research. During the mid-19th century, Northeastern farmers were subjected to a chain of events that forced them to either desert their farms or specialize and intensively produce only a few crops. Agriculture was revolutionized during the 19th century throughout New England. The promise of success and better jobs in cities, along with the pull of the open lands and the lure of gold in the western U.S., resulted in an exodus of farmers from countless rural communities. Political unrest in the early 19th century, culminating in the Civil War, produced drastic changes in the labor market and in the market for agricultural products, resulting in a period of rapid improvement of agricultural technology.

These events signified a shift in the culture of farming, from a farm that only produced enough for the needs of a single family to a commercial farm that involved crop specialization and sophisticated technologies. The mid-19th century marked the beginning of organized agricultural societies, experiment stations, agricultural schools and extension centers. During this time period, farms around Middletown, Connecticut
experienced many of the same changes in agriculture as the rest of New England. However, Middletown stands out as being home to the first agriculture experiment station in the country and to two prominent Wesleyan University affiliates: Orange Judd, an alumnus of the school, and Professor Wilbur O. Atwater. Judd published a number of nationally distributed agricultural magazines, and was the source of consistent financial backing for the sciences at Wesleyan. Atwater was known around the world during the late 1800's for his pioneering research in the fields of nutritional science and agricultural chemistry.

Countless farms have been unable to keep up with the relentless transformations agriculture has undergone over the past few centuries. Lymans Orchard, located right over the Middletown-Middlefield border, is a rare and impressive example of a farm that has weathered innumerable changes in agriculture over the past 264 years. Started as a small family farm, the Lymans specialized during the 19th century, a wise tactic that allowed for the continued success of the farm.

*Lyman Orchards in Middletown, Connecticut: A case study*

Lyman Orchards, now a large orchard and golf course complex spanning hundreds of acres, began as a small farm of 36 acres. The land was originally purchased by John Lyman in 1741. Located in what was then Middletown, Connecticut (since then the area has been renamed Middlefield), Lyman obtained the land with the intent of settling down, raising a family, and being able to grow enough to sustain his family, with the option of selling surplus goods to local markets. Each successive generation expanded the farm, and not long after the initial establishment, the Lymans set up a farm stand on the property. From 1741 until the mid-19th century, the farm remained fairly
small, and was representative of most other family farms in New England. However, the Lymans began to specialize around the 1850s, when they began to focus on raising hogs, pigs, hay and peaches. The Agricultural Experiment station at Wesleyan and the Connecticut Pomological Society were both founded around the latter half of the 19th century and provided valuable resources for the Lymans as they began to enter into intensive agricultural production. From this period until the present, Lyman Farm continued to specialize and transform their crops as markets continued to change. Over time, they switched primarily to apples (which are a harder crop than peaches), stopped raising livestock and entered into the production of strawberries, blueberries, jostaberrries and pumpkins. The key to the long term success of the orchard lies in the Lyman family's ability to adapt to change. A rapid switch to specialization in the mid 19th century was a risk for any farmer, and presented numerous opportunities for failure. The Lyman family has been blessed with generations of farmers with a shrewd business sense, but this has not been the only factor in the continued success of the farm. The location and history of the region have played a significant role in the history of Lyman Orchards.

A brief early history of agriculture in Connecticut

Connecticut’s fertile soil has been an important location for agriculture for hundreds of years. The land on both sides of the Connecticut River was cleared, fertilized and planted by Native Americans. These cultivated fields greeted the Dutch settlers when they first traveled to the New World and ventured up the Connecticut River. The presence of this pre-cleared and cultivated land was one of the primary factors in the

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1 Lyman Orchards, Since 1741. Pamphlet.
European's decisions to settle in a particular area. The Pequots, Pocumtucks and Mohegans were exceedingly capable farmers, and their knowledge of agriculture was the main reason European settlers were able to successfully cultivate their own food and survive in the area. English settlers traveling up the Connecticut River alternated between purchasing corn and other produce from the Native Americans or simply destroying the villages after securing any stored food for themselves. The Pequot war in 1637, between troops of European settlers from both Connecticut and Massachusetts and the Pequot Tribe, resulted in a near extinction of the Pequots. The victorious troops then seized the Pequot's cultivated land and prime hunting grounds, which were handed over to the state.

Wars and violent fights broke out between the Native Americans and the rapidly expanding populations of Europeans who continued to encroach on their land. Many of the battles were fought over arable land, as it was the most important factor in the survival of any settled group of people. It was not until the mid-18th century that the native populations were so destroyed that there was no longer a need for continued fighting over the land.2

The Europeans that settled in the Connecticut River Valley in the early 17th century were primarily of Dutch and English origin. Many of the English came from rural areas, although this did not always translate into a sound base of agricultural knowledge. These settlers that seized the land were only able to continue farming because they were benefiting from the years of agricultural knowledge and saved seed

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2 Russell (5, 109)
possessed by the Native Americans.\textsuperscript{1} Even if a European settler had some degree of farming experience, often it was from an area so different than Connecticut that very little of their previous knowledge applied to their new situation.

The Connecticut River Valley lowlands, which from this point on would always hold the highest concentration of people in the region, also contained the most fertile land. The river valley was formed millions of years ago when the African continent was still lodged up against North America. Cracks formed in the region of extension as the continents began to pull apart. One of these cracks is now the Connecticut River Valley, where sediment accumulated over time, creating fertile soil ideal for farming. On either side of the lowlands are rockier and hillier regions that do not lend themselves nearly as well to agricultural production.\textsuperscript{2} Middletown, Connecticut, falls directly inside this fertile region, a fact which has played an important role in the history of the city and the surrounding rural areas. Not only was the soil fertile in Middletown and throughout the Connecticut River Valley, but this region had a milder winter and a later killing frost than the more northern parts of New England – both factors which gave an edge to the development of agriculture in the region.\textsuperscript{3}

Within 15 years of the initial settling of the land by Europeans, families in the newly formed townships were each allotted a small number of livestock and a modest parcel of land. This setup remained in place for the next 200 years as the most common structure for a family farm in the Northeast. Not until the Civil War were there serious changes in this model. Many of the English families who settled in this region came from towns where every family would share a larger piece of communal land. Although

\textsuperscript{1} Russell (5)  
\textsuperscript{3} Black (38)
this method may have been toyed with briefly at the beginning, it soon gave way to a system of individual plots of land for every family. This trend was mirrored in England, where a number of heavily farmed areas were undergoing the same types of changes, from communal to individual parcels of land. As many of the settlers may have come from these areas, the changes that were taking place in England rapidly spread throughout English settlements in the United States.¹

Initially, a family would simply have a small garden next to their house to provide for their basic needs, and would put their livestock out to graze on common pasture. The Native Americans had shared their knowledge of planting corn, beans and pumpkins, and early English settlers had success with only a small number of root vegetables in addition to these established crops. However, a large part of the diet of many Englishman had been wheat, and settlers cultivated larger parcels of land as they moved into grain production. Wheat proved to be a tricky crop, and was only successful in the most fertile regions of the Northeast, such as the land around and to the north of Middletown and Middlesex County. According to Howard S. Russell, in his book on the history of agriculture in the Northeast, the Connecticut River Valley was the nation’s first wheat belt.²

A typical farm in Middlesex County before during the 17th and 18th centuries may have consisted of one family living on a modest plot of land, with perhaps one or two heads of cattle to provide milk and meat for the family’s immediate consumption.³ A small farm might have had a small number of mixed livestock (cows, goats, sheep and chickens, for beef, dairy, wool and eggs), as well as small fields for grain production.

¹ Russell (27)
² Russell (42)
³ Black (20)
Small apple orchards, primarily created for the purpose of making cider, were also common throughout the region. The number of small farms increased as towns grew larger. As more people in a town chose to specialize in a particular trade, they subsequently needed their food to be grown by someone else. By 1650 the markets for agricultural products had grown to accommodate both the highly populated coastal areas as well as foreign markets. However, the size of farms at the time was still very small compared to what would be considered a small farm today. For example, most farmers had no more than 15 heads of cattle, a fraction of what would be considered a small herd by the end of the 19th century. The acreage for a single family usually ranged between 4-5 acres. A large plot would have been anywhere from 10-20 acres. In the early days of settlement and the distribution of land, a family was not even required to purchase the land. Instead, the township would divide the land between all of the families, and in return, people were expected to be helpful members of the community. ¹ By the second half of the 17th century, these traditions changed as the populations of towns increased, and people began to have to purchase land, or pay for the use of communal land. Farmers were given the opportunity to sell their products during weekly markets and to costal traders, who facilitated international trading.

**Early signs of change and critical events**

The economy, industry and society underwent drastic changes in the mid-19th century, resulting in tremendous change throughout all aspects of life in New England. The Erie Canal, completed in 1825, marked the start of a transportation revolution in the U.S. It preceded the widespread construction of turnpikes, canals and railroads, all created to facilitate the transport of goods and people between rural and urban areas.

¹ Russell (61, 70-73)
Easier transport initially favored New England farmers, since now even the most remote were able to trade fresh produce for dried and imported goods. As time went on, however, western products flooded the eastern markets, removing the New Englander’s advantage. Eighteen twenty-five also happened to mark the beginning of the importation of fertilizers, which signaled the beginning of a century devoted to increasing agricultural production through experimentation and new intensive growing methods. Throughout this period there was a transformation of not only general agricultural methods but of how agriculture was viewed. A divide developed between farmer and consumer, whereas before, nearly everyone was farming for their own consumption.

Towards the mid-19th century, even more substantial changes occurred. The Homestead Act, passed by the U.S. Congress in 1862, spurred a mass migration towards western states and territories. When families took advantage of the land offered in this act, one of the many things left in their wake were scores of deserted farms. Increased industrialization drew people away from farming areas to cities, which offered not only new jobs but an escape from isolated rural life. Increased industrialization also affected agriculture through the production of new technologies, which in turn encouraged the mechanization of agriculture. The Civil War marked a crucial time for the region, as thousands of young, able-bodied men left farms to join the Union Army. Those who were left behind were faced with the need for time and labor saving machines that could replace the lost manpower. Numerous forces drove people to leave the Northeast, setting the stage for changes that would revolutionize the entire structure of New England agriculture.

The Homestead Act

1 Russell (332, 335)
“It seems to me that no man in his right sense would think of going West…” So declared Tirrell, commenting on the problem of the loss of farmers in the Northeast in an editorial for an 1855 edition of _The New England Farmer_. “The chances are, as a general thing, that he will die before he gets anything like his good New England civilization and privileges about him,” Tirrell continued, “…Now I ask our young New England men again, if under all the circumstances…this going West is a paying business? I think not…Take my advice boys, and stay at home.”

Tirrell argues the case for Farmers to stay in New England – a difficult thing to do, as many Farmers were lured away to the western regions of the country after Congress passed the Homestead Act in 1862. One of the aims of the Act was to provide poor laborers with the opportunity to start new lives on public land. Any person over the age of twenty-one, or who was the head of a household, or who had served in the U.S. Army, and who had never given aid to any enemy of the U.S. (or had fought against the U.S.), was eligible to receive up to 160 acres of land for free. A person had to live on the plot for five years, build a house, and cultivate the land in order for the government to make the ownership official. If a person met these qualifications, they only needed to pay a small processing fee and the land was theirs. However, there were many indirect expenses, and trying to fulfill of the obligations set forth by the Act took a tremendous toll on many families. It was difficult to make enough money to survive, and farming in an unfamiliar area presented innumerable unseen problems. The entire situation was infinitely more difficult for those without previous farming experience.

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The Homestead Act was partially written to prevent monopolists and speculators from taking control of the public land in Michigan and Wisconsin or in any of the territories west of the Mississippi. However, it seems to be the case that the naysayers were right all along. Much of the land claimed as a result of this act was subsequently turned over to a single person once the deed for the land came through from the government, creating large tracts of land all held under one monopolist, and perpetuating the problems the Homestead Act was supposed to eliminate.\(^1\) The true farmers, the ones who had not been hired by a monopolist to simply hand over any land they received, but instead had believed they would find new opportunities and successful farming in the virgin soil of the West, often found themselves with the worst plots of land.

*Industrialization*

Farming production in Middlesex County, Connecticut dropped considerably from 1800 to 1840, as many people left the farm to find jobs in industry in urban areas. This compounded the problem of shortages in farm labor, especially since population increase in cities meant a corresponding increase in the demand for agricultural products.\(^2\) People who moved to cities were no longer providing for themselves, and the remaining farmers in New England were unable to keep up with the new demands. Diaries, letters and other primary source material from the 18\(^{th}\) and 19\(^{th}\) centuries document the struggles farm owners had with finding reliable labor.\(^3\) Industrial laborers, enticed by the promise of free land in the West, left behind city jobs that were quickly filled by farmers and farm laborers from the Northeast who had witnessed the hard life of

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\(^1\)Shannon, (51)

\(^2\)Shannon, (243)

farming and wished for a change. Many farm owners were unable to hire labor outside of their own families, as most of the able-bodied men and women moved to cities or to the West. While farms in other areas of the country (such as the Midwest) became larger conglomerates run by a company or a business, farms in New England continued to be run by a single family. This trend continued throughout the 19th century, as nearly all the farms in New England became specialized farms run by one family. 

The Civil War and increased mechanization of agriculture

The Civil War caused labor shortages, and at the same time, caused tremendous increase in the demand for agricultural products. The war, more than anything else, fueled the massive transformations in agriculture in the United States. Although there was more to the situation than a simple cause and effect relationship, the Civil War was a primary contributor to the shift to larger scale commercial agriculture in the Northeast in the second half of the 19th century. In the West, farmers had the advantage of large expanses of nearly virgin soil, coupled with newly developed machines that were tailored specifically to the needs of Western farms. These advantages allowed Western farmers to quickly expand and intensify the production of their crops. Farmers in New England had more difficulty adjusting to the market changes. Many farmers even doubted that any agricultural endeavor in New England would be profitable enough to be worth their time. Farmers who remained in New England now had to view their farms in a new light. An increase in yields, along with a decrease in crop variety called for new methods of fertilizing, planting and harvesting. In some cases, farmers were able to make the most of their location, by exploiting the nearby oceans as a source for fertilizers (fish or kelp, for

2Brown, Beales, Lyman. (119)
example) which gave them an added edge against crops coming from Western markets. Many farmers were discouraged by this new approach to their livelihood, and many established farmers left their New England farms to either find jobs in urban centers, or to start again with farming or speculation in the West. In Middlesex County, Lymans Orchard represents a family owned and operated farm that successfully weathered the market changes, and which emerged from a period of revolution in agriculture as a successful farm that would continue to maintain its dominance in the area for a number of crops for the next 100 years.

A large number of men who would have been farm laborers (approximately twenty-one to forty-five years of age) left their homes, and their farms, to fight in the war. ¹Men who went to join the Army, after the war broke out in 1861, left behind a need for machines that could replace, or at least reduce, the need for manpower in the fields. The first successful plow that could seat a person was developed in 1864, followed by the development of steam driven plows and tractors that could till and plant over 50 acres in one day. These tractors were developed with the large, flat expanses of land of the Midwest in mind, and were never feasible for the smaller plots and varied terrain of New England. Grain farming in the Midwest was further improved by the improvement of the seed drill and the development of automated planters, including the check rower—a machine that planted corn in a perfect grid, allowing it to be cultivated in any direction. ²

Haymaking and harvesting machines continued to be perfected, allowing hay to be harvested faster and easier, and with less man-power than ever before. Continuous hay baling machines and automated grain binders were developed in 1866 and 1880,

¹Shannon (126)
²Shannon (129-131)
respectively, and transformed the process of harvesting, baling and binding grain. Grain thresher were also improved during the 1860’s and towards the end of the century, corn shucking and fodder cutting machines helped cement the Midwest’s position as the most productive area for grain production in the country.  

Western agricultural markets

The expansion of the railroad system across the United States also contributed to the permanent changes taking place in the agricultural markets of New England. One result was the shift the production of wheat, which decreased in New England as the railroads allowed for cheaper wheat to be shipped in from the West. The Western farmers had the advantage of more fertile and larger tracts of land, along with better agricultural machinery. Wheat from the west was sold at prices New England farmers could not match.  

From 1860 to 1899, wheat production decreased in New England from 1,000,000 bushels to 137,000 bushels: an 83% decline. Some of the changes in the market for various agricultural products were met with a direct response by farmers in the North East. For example, between 1840 and 1860, every state in New England increased corn production, and even though New England farmers experienced a decline in corn production after 1860, it was a much smaller decline than that of wheat. Evidence of specialization can be seen in a number of crops, such as potatoes (the production of which nearly doubled in New England between 1860 and 1899) and apples, which also saw nearly a doubling of production throughout the region during the 19th century.  

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1 Shannon (133-135, 137)  
2 Russell (334)  
3 Shannon (246)  
4 Russell (334)  
5 Shannon (246)
These adjustments are evidence of the specialization farmers were forced to undergo in
order to survive the changing market.

In the 1830s, the production of many crops and agricultural products moved to the
West, such as cattle, sheep, and wheat.¹ New England was able to maintain its
dominance in only a few crops, which farmers were forced to adopt and in which they
had to specialize in order to remain in business. Potatoes, cranberries, blueberries,
apples, honey, poultry and dairy production were for the most part more successful in
New England than in other areas (although towards the end of the 19th century, most
dairy and poultry production had moved westward), and these crops gave farmers the
edge they needed to keep their prices at a profitable level. For some products, New
England was able to retain only a portion of the market -- for example, although New
England farmers lost much of the cheese production to Wisconsin and to the Midwest,
they were able to hold onto local milk production.²

Revolution in Agriculture throughout New England

The people who had previously made their living on farms in New England either
moved to the West, to cities, or shifted their farms towards specialized agriculture.
Western states experienced tremendous population growth in the mid 19th century, while
correspondingly population declined in the Northeast. As it became a struggle to
convince farmers to stay in the region, societies and organizations were formed with the
aim of improving agriculture and maintaining interest in farming in the Northeast. The
Connecticut Board of Agriculture, the Connecticut State Grange, farmer’s societies,
Agricultural Schools and Experiment stations were all formed for this purpose. Written

¹Black (14)
²Black (17)
responses to these changes were found in editorials and articles, as concerned supporters of New England agriculture tried to convince farmers to stay at home. The only farmers that were, in the end, able to survive in the new agricultural markets were farmers who had small (when compared to those in the West) specialized farms.

Public Response: Editorials, Articles

Rural towns throughout the Northeast lost both the younger generation of farmers and older farmers along with their entire families. The amount of deserted land in New England grew every year, and many viewed this as a serious problem. Countless editorials about the importance of staying on the farm appeared in newspapers and other publications. Henry French, writing in the Country Gentleman in an article entitled ‘Stick to the Farm’, describes the horrors that await anyone who might consider leaving the countryside to move to the city:

You are tempted to exchange the hard work of the farm, to become a clerk in a city shop...You, by birth and education, intended for an upright, independent, manly citizen, to call no man master, and to be no man’s servant, would become at first, the errand boy of the shop, to fetch and carry like a spaniel...to fill the place which, at best, a girl would fill much better...to humbly suggest to rakes and harlots, as well as to starched and ruffled respectability, what color and fabric bests becomes the form and complexion of each...and in the end, to fail, and compromise with your creditors and your conscience, and sigh for your native hills.¹

French goes on to describe how once a person decides to move their families to their cities, they will find themselves “poorer in everything”. According to French, and to many other writers of editorials pertaining to similar topics, a man has everything to lose if he decides to leave his farm. Independence, honor, social status and money are only a few of the things he will find have vanished once he takes a job in the city. Other tactics included attempts to convince those with money to share the wealth in order to make

¹French, Henry F. “Stick to the Farm”. Country Gentleman. April 27th. 1854.
farming the profitable endeavor it had been in the past: “Men who have capital, should encourage young men to remain in this State [Massachusetts], by aiding them, in their efforts to carry out their operations in farming here.” ¹ Previous to the 19th century, it had been a common practice for a farmer to give all of his land to one son. This was useful during periods where land was scarce, but was an outdated practice by the mid 19th century. Farmland was much more abundant, and it was in everyone’s best interest to have a larger number of farms in the area. This would be made possible by men with capital sponsoring aspiring farmers.

Articles also addressed the problem of farmers moving westward, especially after the passing of the Homestead Act in 1862. Some tried to simply discount the possibility that farming could be successful in the West. A statement such as “Nobody makes money at the West by farming; those who have made money have done it by the rise of land, or other speculation.” was presented as fact, although it was more likely simply personal opinion. ² Others, such as Tirrell, in his editorial for the The New England Farmer, acknowledged the possibility of success in the West, but were still able to come up with reasons for a farmer to stay behind. Indeed, the entire spectrum of opinions was covered, as some authors, acknowledging the fertile soil and expansive plots of free land in the West, used yet another slant by trying to convince farmers that farming in the face of adversity would in fact, make them better people:

...The great fact comes from the constitution of man; which our friends in the West, if represented here to-night, would be unwilling to admit; but after all, we have the evidence in the nature of man and in all the history of man, that it does

require some degree of opposition in man or in nature, to bring out the highest qualities of man.¹

*Agricultural Education*

Agricultural schools originated in New England, with the first school devoted solely to agricultural education opening its doors in 1822 in Maine. Many recognized the need for these schools, as can be seen in the following excerpt from an article entitled "Agricultural Education" from an issue of *The New England Farmer*: "...While farmers, in common with all others, can educate their sons for leaving the farm, does not the public good require that they should also have the means of educating them to stay on the farm?"²

In 1862, with the passing of the Morrill Act, states were able to accept public land that would be bestowed upon colleges that focused in agriculture and the mechanical arts. Connecticut was one of the first states to have accepted land under the conditions of this Act, with Yale University as the recipient. As part of the terms in accepting the land, Yale was required to admit a certain number of students to study in agriculture and mechanical arts, who would be allowed to attend the school free of charge. Students studying agriculture were put into a three-year track, during which they studied a number of subjects in addition to agricultural science, such as intensively studying in foreign languages.

Meanwhile, the Storrs Agricultural School had been founded in 1881 and was experiencing a number of problems, including negative public opinion of the school. Storrs had been founded as a place where farmers could send their sons to gain a basic

foundation in the agricultural sciences. There had been talk of moving the agricultural program at Yale to a school that was more oriented towards agricultural education (since Yale was, after all, a college that focused in the classics), but because of Yale’s influence and prominence, their status as the states land grant school had not been fiercely debated. The Connecticut State Grange, a strong supporter of Storrs, became involved and worked first for the continuation of funding for the Storrs school, and then for the improvement of the school through lobbying to move the land grant status from Yale to Storrs. In 1887, Congress passed the Hatch Act, which granted every state a certain amount of money that was to be put towards creating or funding agriculture experiment stations. This was a pivotal moment for Storrs, as half of the money given to Connecticut was given to the experiment station at Wesleyan University and half was given to the experiment station at Storrs. This was a boost to the Storrs school, and worked in its favor during the later fight to take the land grant status from Yale. In 1893, the Storrs school was renamed Storrs Agricultural College, and became the land grant school for the state of Connecticut. In 1939, the school was renamed the University of Connecticut.  

This time period marked tremendous advances in agricultural science. Farmers were now able to share new information and discoveries with each other through bulletins sent out from agricultural societies and experiment stations, and through journals geared towards farmers such as the The New England Farmer and Prairie Farmer. There was also an overall increase in the education of farmers, as more families

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were able to send their sons to at least some sort of school, and possibly to a more specialized school such as Storrs.¹

However, farmers could not single-handedly open up these schools, and much of the groundwork for the creation of these schools was done by established organizations such as the Connecticut State Grange, founded in 1875. The Grange fought for the creation of the Storrs Agricultural School, and later fought on the schools behalf to have an experiment station built at the school. Acting as a lobbyist for farmers in a number of different areas, the Grange has been credited with a number of important victories for agriculture and farmers in the state. For example, the Grange worked to have the land grant status removed from Yale, since it was a private institution which offered education in classical literature – a program believed to be at odds with vocational education. Storrs became the new recipient for the land grant, and later became the University of Connecticut – a series of events that may never have happened if it were not for the Grange.²

*Creation of a supportive infrastructure for farmers*

Intensive agriculture grew with the increase in the specialization of crops. Farmers who wished to survive in the new markets were forced to specialize, and then to intensify production. This new system demanded a farmer to think like an entrepreneur, and created an entirely different atmosphere on the farm from that which had been created by the traditional family centered subsistence farming practices. Farmers who specialized in a small number of crops needed to learn about ways to grow these crops more efficiently, with less labor and higher yields. Research was done both on the farm

¹Shannon (251)
and in experiment stations, and in both cases information gleaned from the experiments was then shared with the larger community of farmers who were growing similar crops. Research was done on particular varieties of seeds, planting methods, harvesting methods, and fertilizing techniques (for example, the use of imported fertilizers and the use of fish as a fertilizer). Articles in publications aimed at farmers spoke of the necessity of focusing on the science behind agriculture. This was as much to increase yield as it was to fight the problem of soil that had been drained of nutrients after centuries of farming. One such article, entitled “Old Fields”, describes the faith in science that was prevalent at the time: “These old fields have experienced the blighting curse of thoughtless man’s cupidity, and restoring them to fertility again is all up-will work, but science can accomplish it.” ¹

New discoveries were shared through the networks of agricultural societies. The Connecticut Board of Agriculture was established in 1865, and the Connecticut Pomological Society was formed a few decades later in 1891. The Pomological Society was made up of a small community of peach and apple farmers (including the Lymans), who shared information about crops, diseases and pests. The Connecticut Board of Agriculture was the umbrella organization that coordinated the experiment stations in the state, and facilitated the distribution of newsletters and bulletins containing the results of experiments conducted at the stations. Farmers also sent in their own tips or recent discoveries to the Board of Agriculture, which then added these pieces of information into the newsletters. ²

The Agriculture Experiment Station at Wesleyan

²Shannon (251)
Wesleyan University played a central role in the growing field of agricultural science and research during the mid 19th century. Two of the most influential people in the field of agricultural research had strong connections to Middletown: Orange Judd (a Wesleyan graduate) and Wilbur O. Atwater (a professor at the University).

Orange Judd graduated from Wesleyan in 1847, and went on to a number of different careers, ranging from publisher to railroad mogul. Judd published a number of agricultural magazines (The Orange Judd Farmer, American Agriculture), wrote for the Prairie Farmer, and was the agricultural editor for the New York Times. In addition to his work in publishing, he worked as a chemist, a high school principal, a professor, served in the Civil War and founded the New York Flushing and North Side Rail Road. Judd was a member of the American Association for the Advancement of Science, as his primary interests lay in the field of science and agriculture.

Orange Judd Hall (now referred to simply as Judd Hall) was the first building devoted solely to science on any college campus in America. All of the science departments at Wesleyan (chemistry, botany, geology, psychology and biology) were housed in the building, along with classrooms, labs, offices and a museum of natural history. ¹ The first corner stone was laid down on May 5th 1870, and in a little over a year the state of the art building was finished and ready for use. Orange Judd promised Wesleyan $100,000 to build the hall, although he filed for bankruptcy in 1884 before all of the money had been paid. The school was forced to use funds from the endowment to finish financing the building. ² However, despite these financial troubles, Judd Hall proved to be an invaluable addition to the Wesleyan campus, by providing much needed

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¹(No Author). “Orange Judd Hall of Natural Science,” The College Courant, August 6, 1870
space and facilities for scientific research. Judd Hall also served as the home for the first agricultural experiment station in the country.¹

The experiment station, although initially funded by Judd, was brought to Wesleyan by Wilbur O. Atwater (1844 – 1907). Atwater, a revered figure in the field of nutrition (literature put out by the USDA has refers to him as “the nation’s first nutritionist”)² also attended Wesleyan as an undergraduate. He continued his studies at Yale University, where he became interested in the field of agricultural chemistry.³ Atwater’s accomplishments include building the first bomb calorimeter in the U.S., (which measured the caloric content of food items) and writing the first table of nutritional values for a wide variety of foods that was published in the country.⁴ Atwater was interested not only in the broader field of human nutrition, but also researched ways to improve the nutrition of the poor, the underprivileged and the malnourished.⁵ He recognized the importance between how food is grown and its nutritional content, a revolutionary idea that propelled him to become a pioneer in the field of agricultural research and human nutrition. As he stated in the 1894 Yearbook of Agriculture:

Our food production is one-sided. It includes a relative excess of the fat of meat, of starch, and of sugar, the substances that serve the body for fuel to yield heat and muscle power, while the nitrogenous substances, those which make blood and muscle, bone and brain, are relatively deficient... What is needed is more nitrogen in plants to make better food for animals and man... Better culture of soil and better manuring will

⁴“The Wilbur O. Atwater Lecture”
⁵“Atwater’s Achievements”
bring not only larger crops, but crops richer in nitrogen... The power of man to do work depends upon his nutrition...¹

Atwater’s interest in human nutrition was intricately connected to his interest in agriculture. In 1873, Atwater tried to petition the government to approve funding for the creation of an agricultural experiment station in Connecticut. ² Two years later, and after two failed attempts to start the station, he received financial backing instead from Orange Judd. Recognizing the importance of having the experiment station at Wesleyan, Judd announced that he would donate $1000 towards its establishment. Wesleyan agreed to let the station use the labs in Judd Hall free of charge, and Atwater, in an attempt to further emphasize the base of support at the University, volunteered $50 of his own money for the station. With this initial support already in place, the Legislature decided to provide the school with the remaining portion of the money needed to start the station. ³ By 1875, the station was up and running at Wesleyan, with Atwater as director. At its inception, Atwater summed up his goals for the station in a statement that demonstrated his belief in the practical application of scientific research: “We want to get it [results from experiments] into forms so plain that the ordinary farmer will understand it the first time he reads it, so short that he won’t tire before he reads it through, and so practical that he will take it to heart.”⁴ During the years the station operated at Wesleyan, Atwater conducted research on fertilizers, on the growth and composition of field crops, on the

³Schneider
⁴Atwater, quoted in Schneider
nitrogen metabolism of plants and was one of the first researchers to explain and provide evidence for the nitrogen fixing properties of legumes. ¹

However, despite Atwater’s prominence in agricultural research, the experiment station was moved to New Haven just two years after it opened at Wesleyan. Although there were some political reasons that may have caused this move (since some people were concerned that a state funded station was at a private institution), Yale University had a great deal of influence, and was also able to provide a larger facility in New Haven, also rent free. Although he resented the move of the station (now the Storrs Experiment Station), Atwater continued to serve as the director. Before long other agricultural experiment stations built in the United States were based on the model Wilbur Atwater established at Wesleyan. Atwater believed all of these independent stations should be provided with funding from the government. He wished to somehow connect each station through a larger network that would allow for new discoveries and information to be easily transmitted from one station to another. ² His efforts contributed to the passing of the Hatch Act of 1887, which created the United States Department of Agriculture (the USDA), formed a new Office of Experiment Stations (with Atwater as the director), and gave each state funding for an experiment station. ³ As the director of this new office, Atwater summed up his new position with the statement: “The idea is to bring the stations throughout the country together, to unify their work, to put them in communication with the great world of science.” This signifies the national move towards more scientifically driven agricultural methods.

²Schneider
³“Atwater’s Achievements”
Atwater was key to the start of widespread communication between agricultural scientists and the farmers they were supposed to serve. The first Farmer's Bulletin and Experiment Station Record was published by Atwater, and became so popular that the USDA made it a regularly published series. ¹

Conclusion

The revolutionary transitions in industry during the mid 19th century had a tremendous impact on the economy and on society. As industry increased, so did urbanization, and with it, the flight from rural areas towards urban centers. The pull of the West, strengthened by legislation such as the Homestead Act, acted as yet another drain on farming populations in the Northeast. Those who remained on farms were forced to reshape their lives and their farms in order to survive in the new economy and in the increasingly competitive farm markets. Many farmers, such as the Lymans, dealt with these changes by turning to specialized agriculture. This required a more intensive approach to farming, which would not have been possible without the scientific advancements that came out of organizations such as the Agriculture Experiment Station at Wesleyan University in Middletown, Connecticut. Lyman Orchards benefited from its location in the fertile river valley, its close proximity to Wesleyan University's agricultural scientists and experiment station, and its geographical location in the Northeast – a center for scientific advancement in the field of agriculture during this time period. By the end of the 19th century, the economy and the culture of farming in Middlesex County, Connecticut, and throughout New England had changed forever.

¹Schneider
Further Research

Although the economic changes throughout New England as whole have been well documented, this is not true for many of the specific towns within the region. It would be interesting to find out more about the specific economy of Middletown during the mid 19th century, and to see if the changes in the farms around the town were affecting the economy of the town itself. Further research into smaller and less successful farms than Lyman Orchards is also needed. For the bulk of the smaller farms around Middletown - when did they go out of business? Did farmers simply desert their land, or were there attempts to specialize that were then unsuccessful? A more in-depth study into the history of Lyman Orchards could also reveal valuable information about how farms were changing and adapting throughout the 19th century.


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