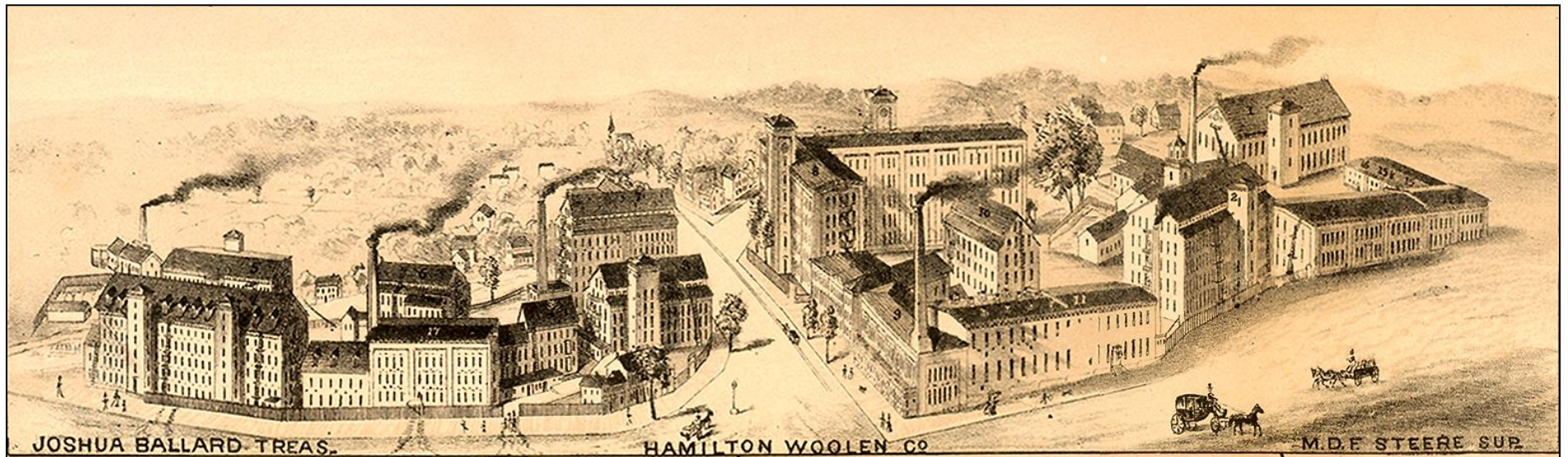


# An Introduction to Industrial Amesbury

1790 - 1930



Textile mills along the Powow River, from 1880 aerial map

**Mike Harrold**  
Industrial Survey Volunteer

Amesbury Carriage Museum  
Amesbury, MA

# Introduction to Amesbury Industries, 1790-1930

what happened, how it happened, how it un-happened

Amesbury Industrialization

Textile industry 1790-1912

Carriage manufacture 1853- ca. 1910

Auto body manufacture 1900-1930

Hat making 1770-1970

Several other industries

Decline

High industrial employment & cash flow for a small town

# Summary and Scope of Amesbury Industries

Salem, Newburyport, and Beverly, Massachusetts and Wiscasset, Maine were once thriving seaports having their own customs houses. Elias Hasket Derby (1739-1799), of Salem has at least a rumor-quality reputation as America's first millionaire, second in wealth only to the Cabots of Beverly. The wealthy Lowell and Jackson families of Newburyport had established Boston offices from whence they managed merchant fleets and financed textile industries. Amos and Abbott Lawrence, originally of Groton, Massachusetts, were other wealthy merchants who invested with, and in parallel to, the Newburyport group. With Boston as a center, the financial clout of such families radiated out to locations of accessible waterpower.

The Amesbury millyards have been the site of iron works, grist and saw mills, and textile mills since 1641, powered by 75 feet of drop in the Powow River over an eighth of a mile. Of that, there was 66 feet of drop over five dams (originally six) plus several feet of drop between dams. All existing brick buildings along the Powow were originally textile mills, large and highly industrialized for their time. They had substantial capitalizations financed by the wealthy Boston investors including the Lawrence brothers, who later built Lawrence, Massachusetts.

Amesbury entered organized carriage making in 1853, becoming a major supplier in the niche of high-quality craft-built vehicles. Moderately sized factories were located away from the river, mostly without any power at all, with only modest (local) capitalization and industrial sophistication, even for the carriage industry. They used rationalized semi-industrial methods for efficient production. The local trade never recovered market share after the depression of the 1890s, losing business to large and highly industrialized Midwest factories that were making low-cost consumer commodity carriages.

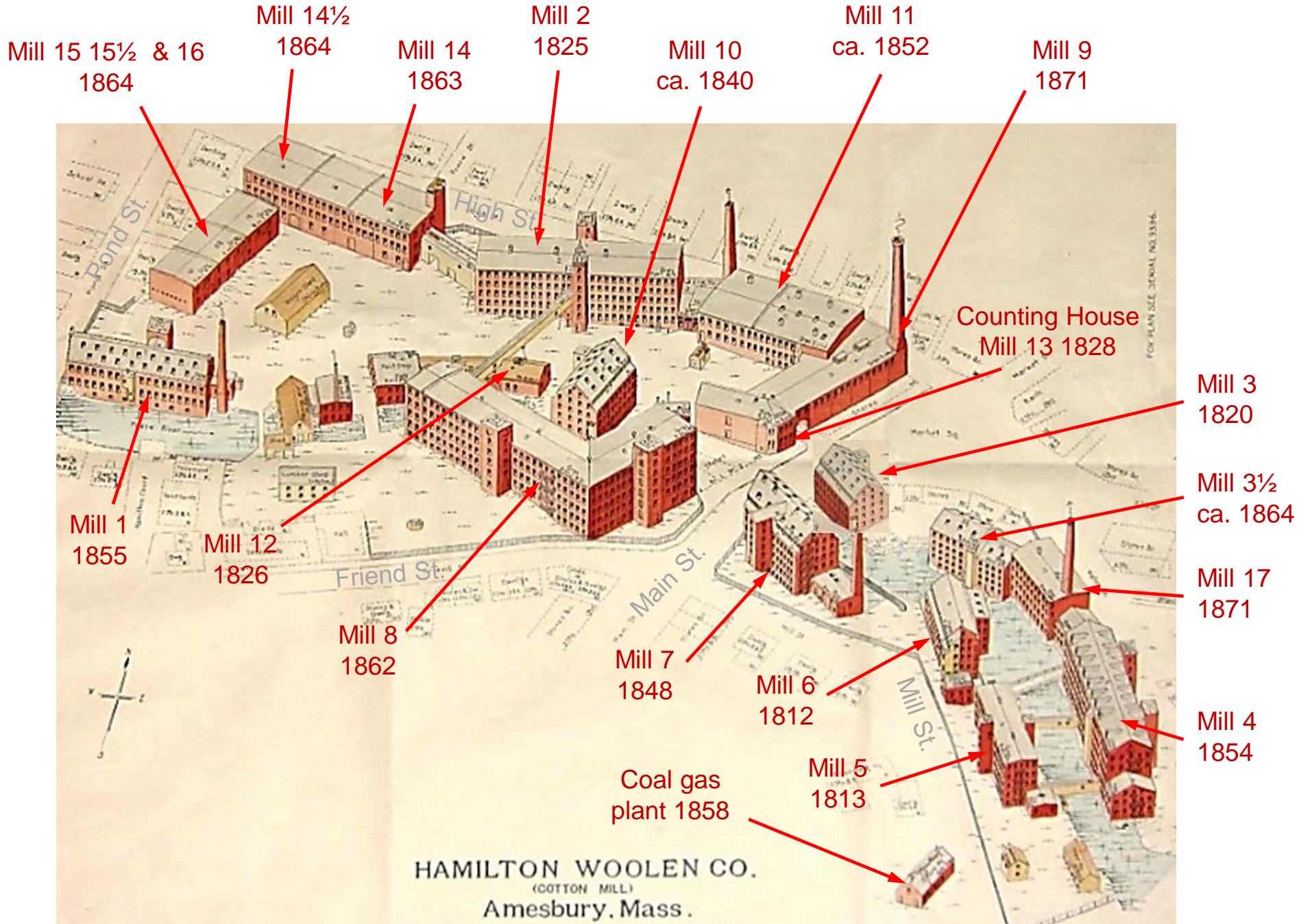
After 1900, carriage factories were rapidly electrified and converted to production of auto bodies. Once again, moderately sized factories carved out a boutique niche of up-market bodies for Buick, Franklin, Stanley Steamer, Cadillac, Hudson, and many others. That came to a rapid end with the Crash of 1929 and the Great Depression. Many of Amesbury's auto body customers were already consolidating operations and vertically integrating body making into their vastly larger, highly industrialized, and closely coupled mid-western plants. The end was inevitable in Amesbury, even without the Depression, followed by large-scale loss of the former carriage buildings. The mass-extinction of the industrial architecture has made it difficult for people today to visualize what once existed.

# Enabling Conditions for Amesbury's Industrial Success

- 1) Powow River – groomed & managed water rights since colonial times
  - 75 feet of drop in about one eighth of a mile
    - sufficient to potentially yield about 2000 horsepower at the falls
  - Small enough to be easily harnessed by dams less than 50 ft. long
    - six dams in 1825 divided flow into separate power rights
  - The small size and dry spells ultimately limited industrial waterpower capacity
  
- 2) Wealth
  - Nearby seaports: Salem, Beverly, Newburyport, Portsmouth, and Boston
    - wealthy mercantile investors built local textile industry
  
- 3) Merrimack River
  - Large transportation route directly to seaport (Newburyport) and world
    - also supported shipbuilding through first half of 19<sup>th</sup> century
  
- 4) Railroad
  - Eastern Railroad branch line opened in 1848, promoted by textile trade
    - critical means for material inflow and product distribution
    - primary land transportation route for passengers and freight

Manufacturers' Hotel hosted Amesbury visitors, indicating local mindset for industrial productivity

# Textile Mill Buildings Along the Powow River - 1910



# Textiles, Mechanization, and Industrialization

paradoxical reverse order of industrial sophistication

Textiles were fully mechanized very early in the Industrial Revolution

- there was compelling demand for raw fabric, an ancient trade
- each textile-making step had always required mechanical contrivances
  - cleaning, carding, spinning, bobbin winding, weaving
  - some contrivances were simple and limited
- by late 18<sup>th</sup> century, all steps were substantially mechanized & automated

By 1800 England had water-powered textile mills populated by low-skilled labor

- We thus see early 19<sup>th</sup> century images of highly mechanized mills
- We could easily assume that such was common throughout industry

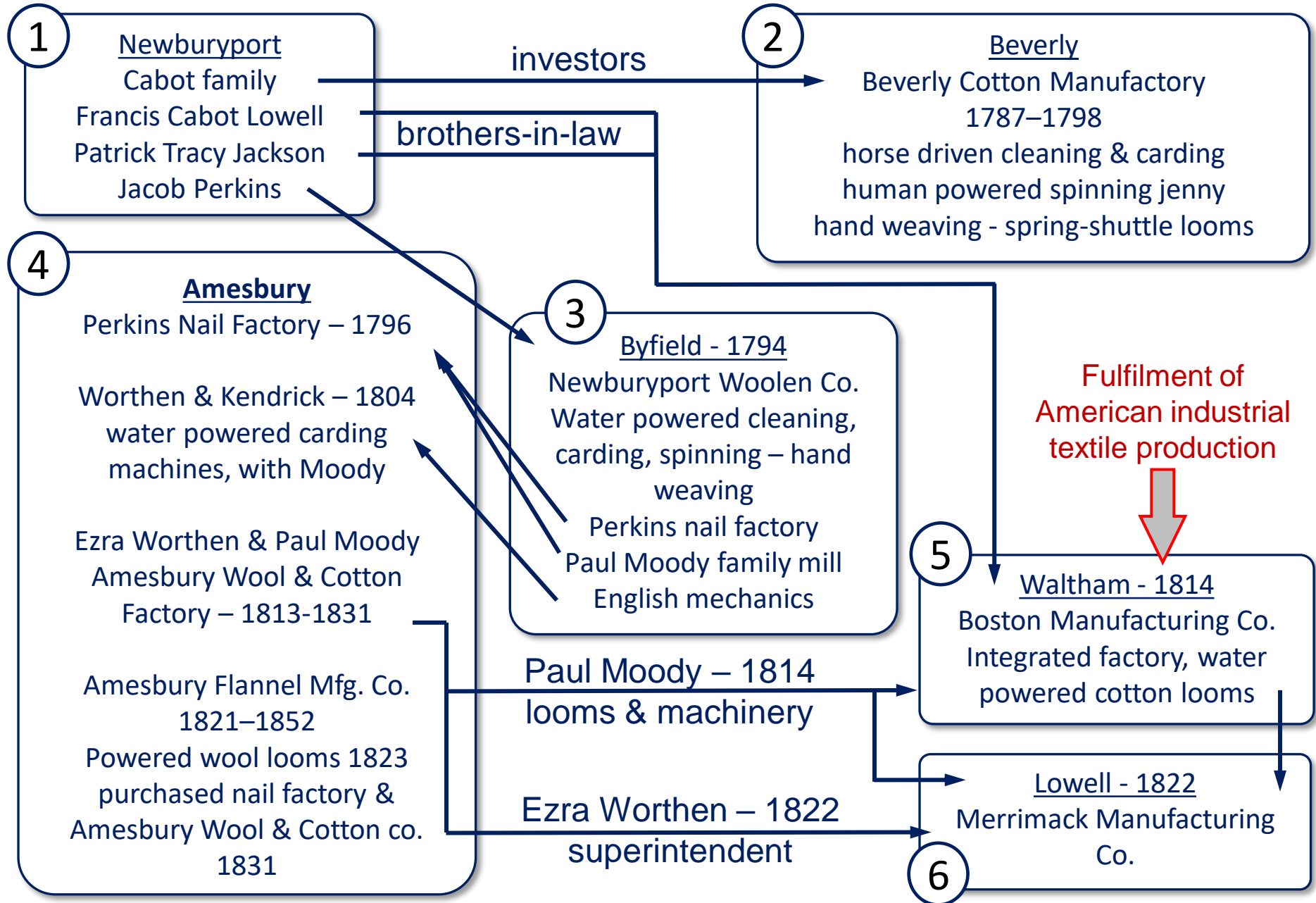
Another century was required for such industrialization to fully reach other industries

- the 19<sup>th</sup> century climbed gradually toward general industrialization
- early steps used rationalized manufacturing methods, low-hanging fruit
  - labor management
  - increased subdivision of labor
  - efficient flow of materials into progressively assembled products
  - limited machinery, little automation, little interchangeability
- industry was learning how to manage the flow of mass-production

Amesbury industries follow this “reverse” trend, beginning with mechanized textiles, followed by lower-technology carriage & auto body manufacture

# Amesbury Amid Pioneering of American Industrial Textiles

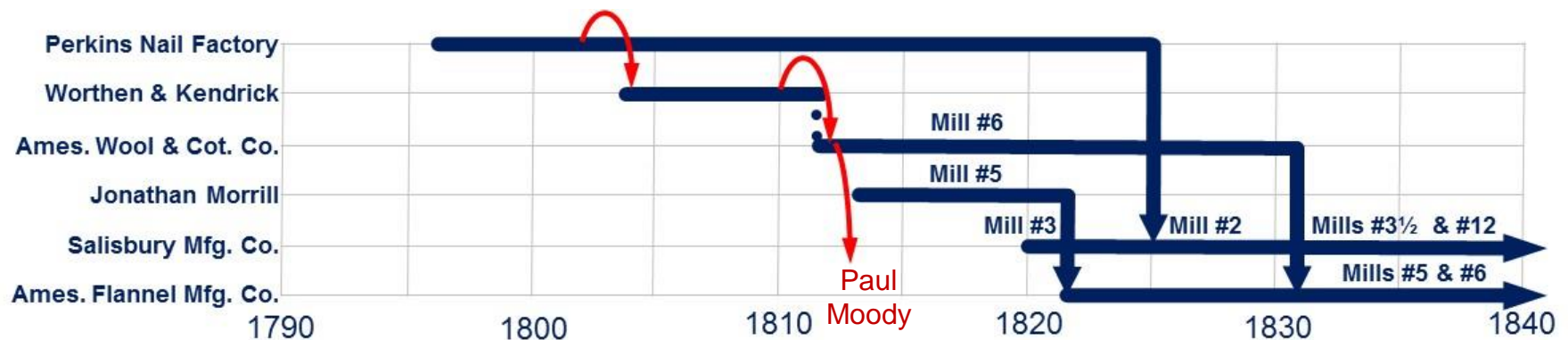
Amesbury area people, businesses, and mills in the direct path to textile industrialization



# Development of Amesbury's Millyards

There had been grist mills and saw mills around Amesbury's upper and lower millyards since 1641, plus an iron works on the Salisbury side of the upper yard, similar to the Saugus iron works. These had been joined in 1796 by Jacob Perkins' nail factory on the Amesbury side of the upper yard. Paul Moody came to Amesbury with Jacob Perkins, and then became involved with Ezra Worthen, of Amesbury, in a carding machine distribution business. Their 1812 Amesbury Wool & Cotton Factory built a textile mill that is the origin of Mill #6 in the lower millyard. Amesbury's original Mill #5 was started in 1813 by Jonathan Morrill and his two sons. Mills #5 & #6, the first two of the modern Amesbury textile mills, were purchased in 1821 and 1831 respectively by the newly formed Amesbury Flannel Manufacturing Company, owned by brothers Amos & Abbott Lawrence of Boston. They expanded Mills #5 & #6 in several steps, building a successful business that introduced America's first powered wool looms in 1823.

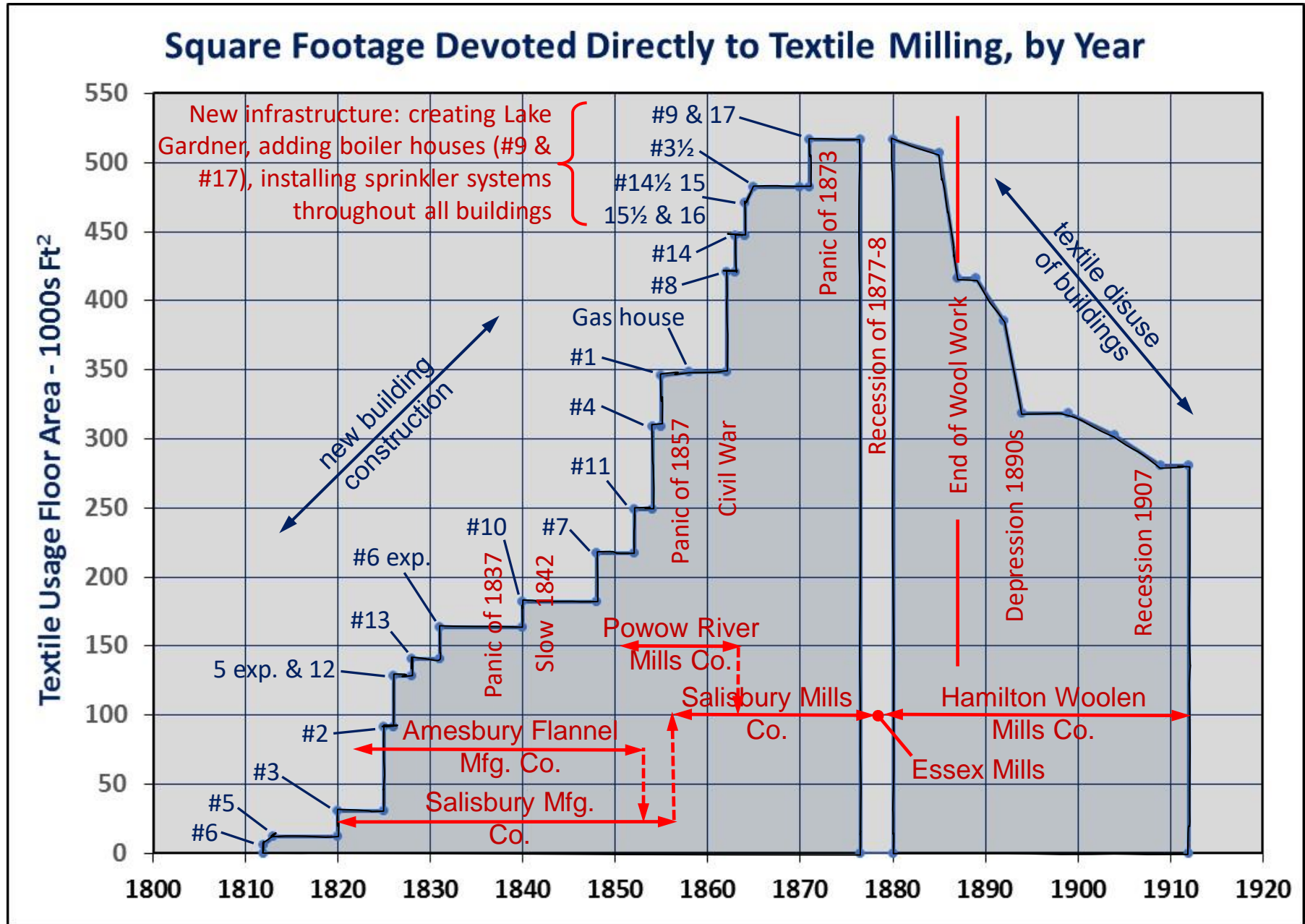
Paul Moody was tempted away from Amesbury in 1814, joining Francis Cabot Lowell's Boston Mfg. Co. in Waltham to perfect their powered cotton looms, essentially becoming their chief mechanic and machine shop manager. Ezra Worthen joined Moody during the 1820s in the newly developed town of Lowell as manager of the company's mills there.





# Rise and Fall of Textile Mills Along the Powow River

The mills closed by recession from 1876 to 1880, then closed permanently in 1912



# The Scale of Amesbury's Textile Mill Complex

Five story and two-hundred-foot-long Mill #2, built in 1825 from one million bricks, was a substantial American textile mill of its time. Additionally, it contained waterwheel equipment powering line-shafting throughout the building and was filled with textile machinery. Overall, investing in waterpower implied further investing in the building and equipment to be powered, elevating waterpower to the town's most valuable commodity. Fates of mill towns were thus frequently tied to a single industry owned by outside investors. Amesbury had the good fortune to develop additional industries supporting an independent economy.

Along with working mill buildings the textile company owned adjacent company housing plus several infrastructure services, the latter also benefitting the town. They opened in 1858 a coal gasification plant on Mill Street that not only served the mills but was offered to citizens via the Amesbury & Salisbury Gas Company. When the mill gas plant closed in 1887 it was replaced by a larger works on Water Street created by William Biddle and other carriage entrepreneurs.

As the mills constructed major new steam power facilities in 1871, they built a powered water distribution system with both inside sprinklers and outside fire hydrants to protect their numerous machinery-laden buildings. The city then installed street hydrants around the town center, connected to the mill system. These town facilities were replaced after 1885 when carriage entrepreneurs created an extensive private water company, purchased by the town in 1905 as a municipal utility.

The mill water system was among major infrastructure expansions that likely drained much of a Civil War cash surplus, the mills thus closing in 1876 for four years amid hard times. Having a million-dollar capitalization but dragged down by obsolescence, even as the renewed economy was again flourishing, they were purchased in 1880 for \$300,000, followed by \$600,000 of upgrades and improvements over the next two years (see factory value chart). Wool processing ceased in 1887, that space then going completely fallow as owners struggled to compete in printed cotton goods. The mills closed permanently in 1912.

# Mill Building Reuse and Electric Power Generation

Several previous investors next created the Merrimac Valley Power and Buildings Company as an industrial condominium and electric power utility, the latter in conjunction with the electric generating plant built in 1887 by carriage maker, William G. Ellis, at the bottom of Oak Street (now long gone). Mill #6 (the oldest) was demolished in 1914 making space for a larger turbine room below. Through 1916 the downstream riverbed was blasted deeper up to the turbines, and a large new headrace installed from the first dam, across Main Street, to the new turbines and generators. The Powow River falls' entire power supply was thus captured for perhaps 1000 HP of electric output. Also, about another 800 HP was generated at a new Lake Gardner dam, replacing the old dam that the textile company had built in its 1870s infrastructure program. That had created Lake Gardner as a reservoir against dry times that occasionally closed the mills.

Next was to make the mill buildings financially productive. The textile company had retired Mill #3 after 1876, converting it to commercial retail space, removing the top 2½ stories, and eventually selling it. The new company gradually sold non-mill real estate (only one mill row-house survives) and began finding tenants. From 1915 the mill coal-gas building was used as a foundry serving auto body making until being demolished in the 1920s. The north end of the upper millyard was occupied for years by the Metalite Co. making a composite fiberboard (leatherette) that simulated leather for stacked shoe heels. The entireties of mills #5 and #7 were occupied into the 1930s by a pair of related companies making abrasives plus lead and steel shot. The entireties of large mills #2 and #4 were occupied into the 1970s by a series of auto body and shoe companies, and then the Bailey Mfg .Co. making felt lined window channels for automobiles. The Main St. wing of Mill #8 was demolished in 1928, replaced by five front-to-back retail spaces; the river wing burned in 1951. Mills #5 and #10 were demolished during the 1930s, mill #10 having housed a printer and auto repair business for a time.

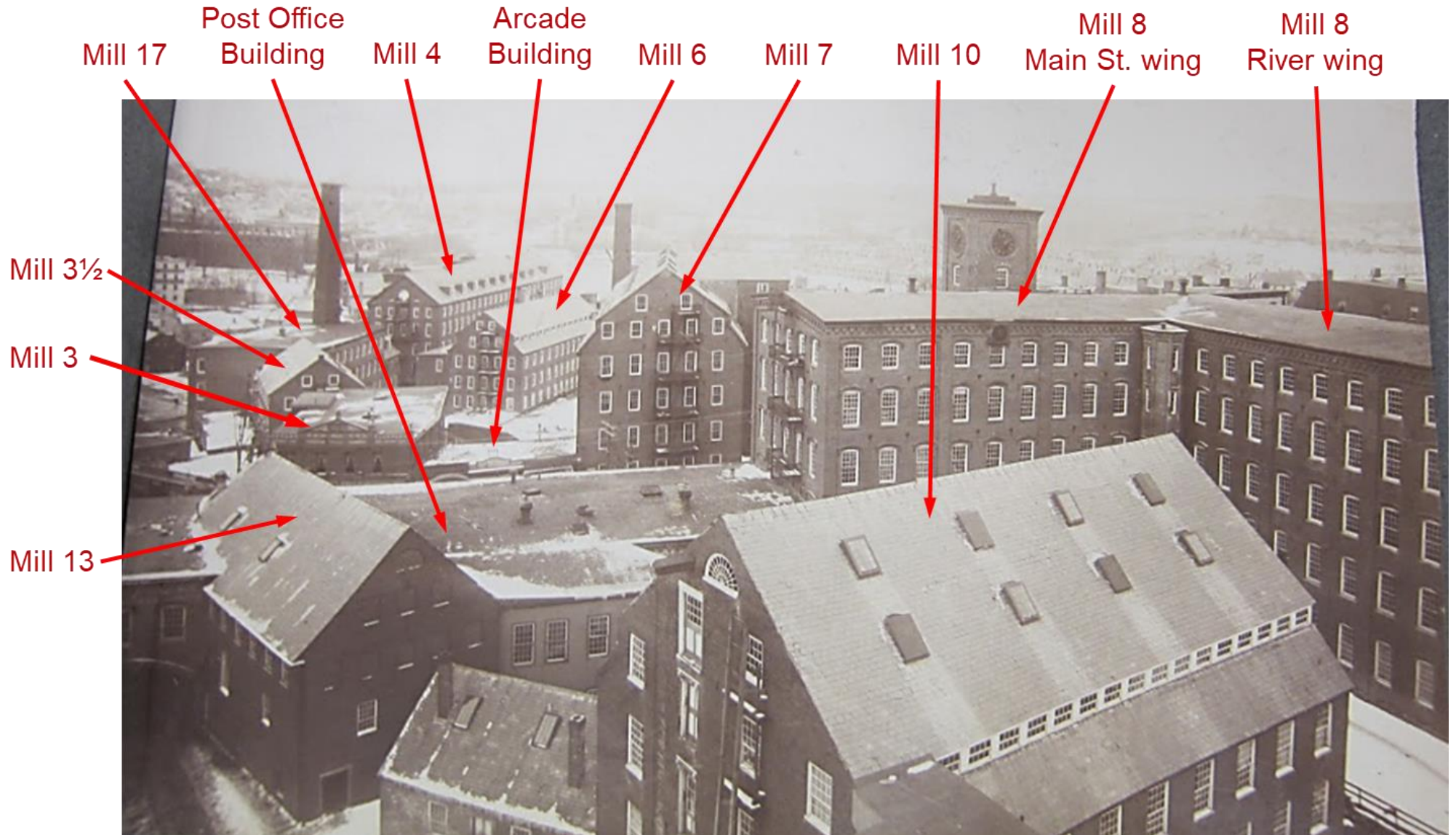
Relative stability of the Merrimac Valley Power and Buildings Company and Bailey Mfg. Co. preserved the majority of mill buildings. Fates of carriage and auto body buildings (largely one continuous group) were much more precarious, with a far lower survival rate.

# Looking Down Through Upper and Lower Millyards, ca. 1900

seen from the stairwell of Mill 2 (Amesbury Industrial Supply)

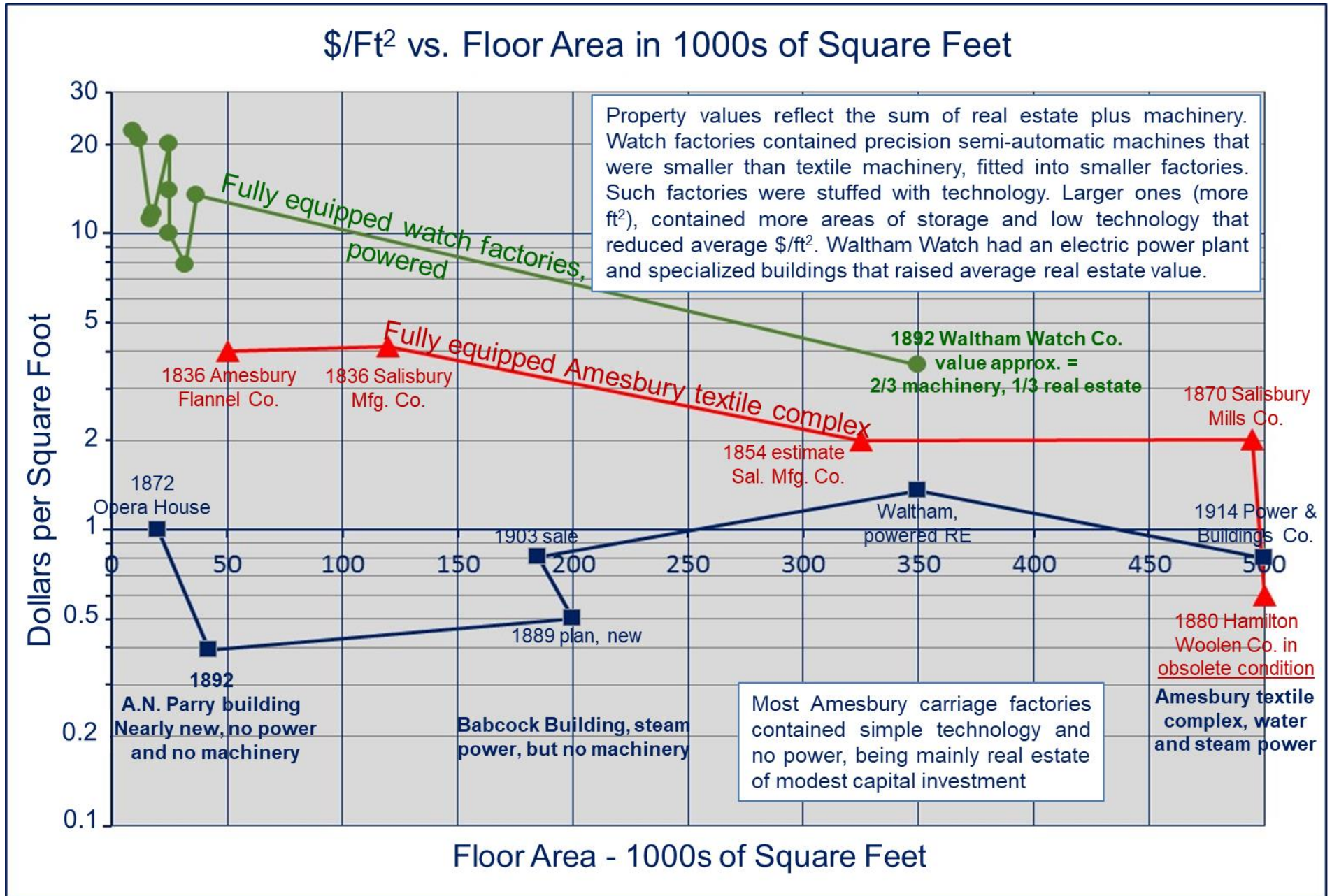
Mill building population is at its peak, with large Mills 7 & 8 dominating Main Street. Mill 3 is seen in its first phase of being cut down, reduced here to two stories.

Between Mills 3 & 7 can be seen the roof of the Arcade Building, located right over the river.



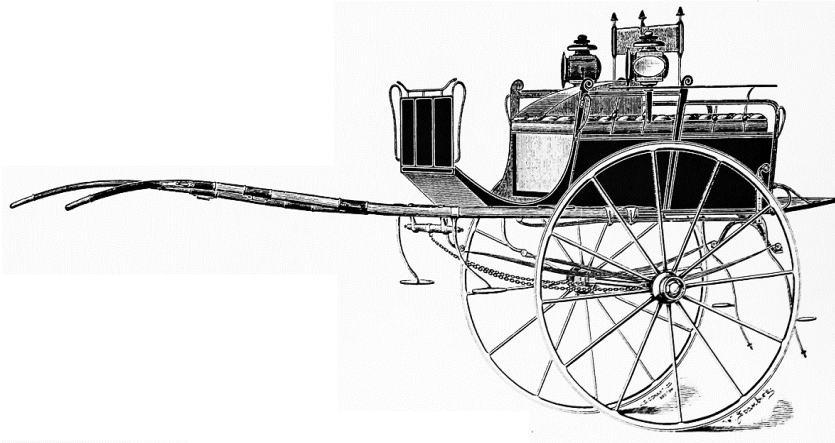
# Dollar Value per Square Foot of 19<sup>th</sup> Century Factories

Equipped watch factories (green), equipped textile mills (red), unequipped buildings (blue)  
 values generally based on company capitalization



# A Range of Amesbury Carriages<sup>1</sup>

Carriages are personal comfort vehicles having upholstery & spring suspension.

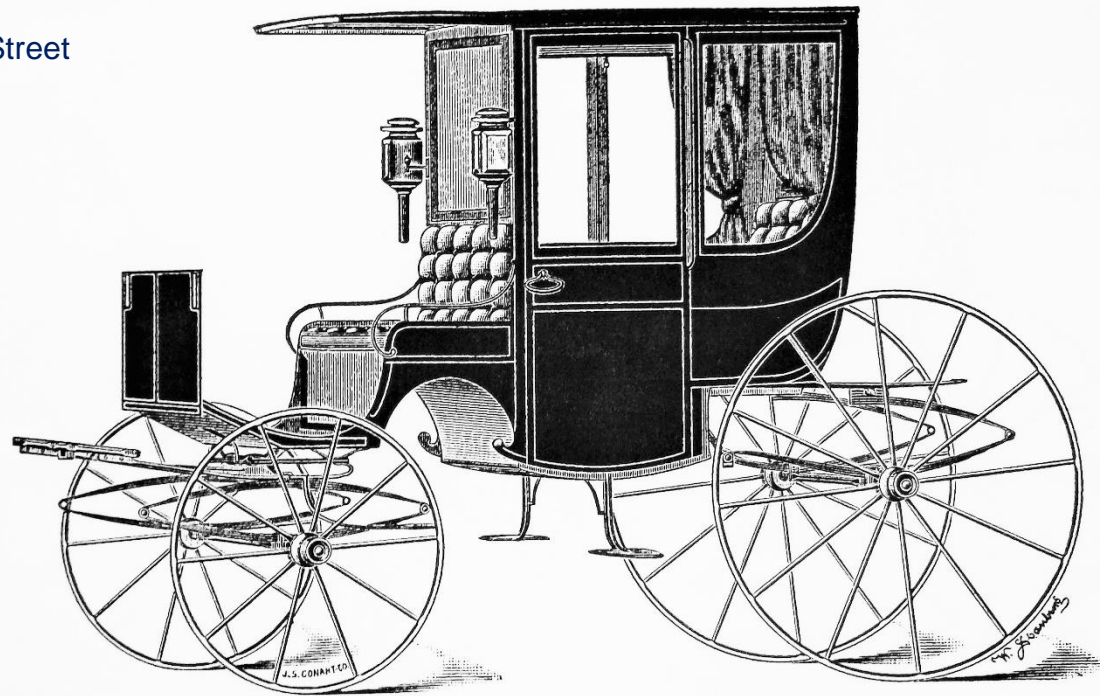


Left, elaborate 2-wheeled chaise, or “one hoss shay,” also simply called a cart, by Neal & Bolser, 258 Main Street across from the Macy house.

<sup>1</sup> Amesbury, Mass. Carriage Center of the World, reproduction, 2006, Algrove Publishing Limited, Ontario, Canada

Below, Rockaway enclosed carriage by Lambert Hollander, 1 Oakland Street. Commercial versions were used as light delivery wagons, with some types known as “station wagons” for taxiing travelers, luggage, and cargo to train stations.

Folding top phaeton by Eben M. Currier, 11 Oakland Street



# Summary of the Amesbury Carriage Industry

Brought to Amesbury from Merrimac by Jacob R. Huntington in 1853

- standardized a middle-to-high-grade vehicle around 4 production concepts:
  - a relatively simple & popular carriage style
  - part duplication by simple means (drawings, templates, gauges)
  - simple assembly line with specific employees & parts at each station
  - wholesale distribution, to avoid tying up money in slower retail sales
- wholesaled at average price range of \$100-\$200 during the 1880s-90s

A simple low-capital small-business model carried out in mostly un-powered shops

- easily replicated around town
- able to hold a niche market in craft-built fine carriages
- prone to disruption from large industrialized makers encroaching on their markets
- unable to recover from the depression and competitive conditions of the 1890s
  - shops rapidly shifted to auto body manufacture after 1900

Americas five top carriage making cities:

- Cincinnati – largest carriage maker, & machinery maker
  - Chicago – large industrial carriage & machinery maker
  - St. Louis – large industrial carriage maker
  - New Haven – high-grade enclosed craft-carriages for N.Y.C. trade
  - Amesbury – semi-industrial maker of craft-built fine carriages
- } Centrally located transportation hubs, all having both rail and major river/lake access

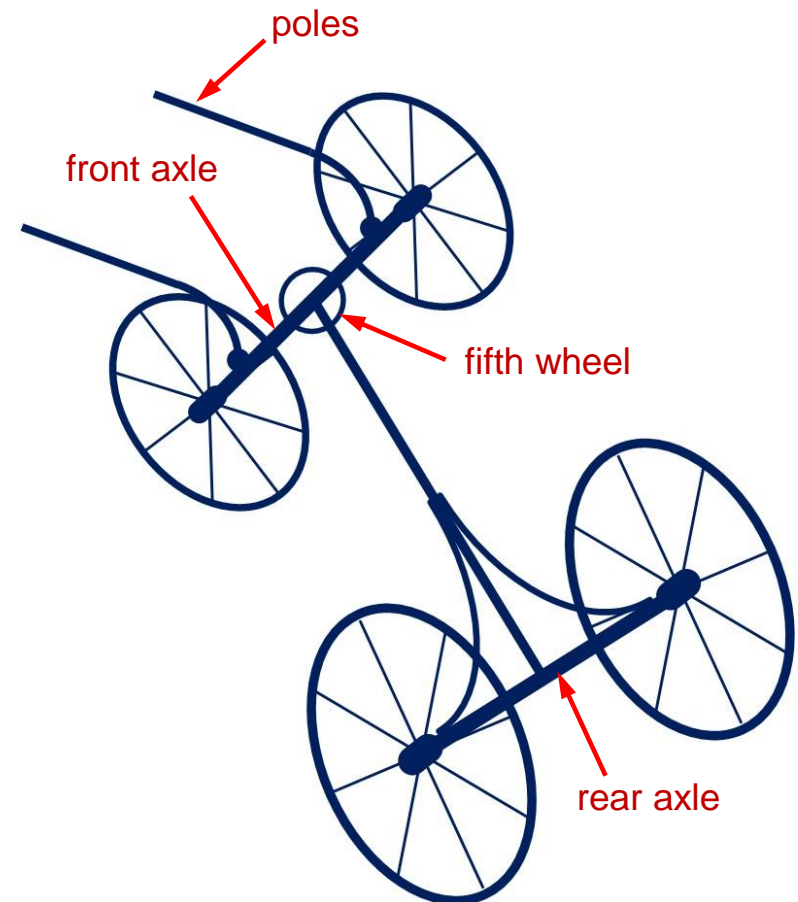
Amesbury merged hand-craft, soft industrial management skills, and light industrial technology to occupy a major position in high-grade carriage manufacture.

# Basic Carriage Function and Comfort

As with little red wagons and semi-tractor-trailers, fundamental four-wheel carriage structure derives from wagons of old. A front axle-and-pole assembly is attached directly to the horse, via the poles, and follows the horse around curves. In the middle of the front axle is pivoted a rear axle and assembly that follows as a trailer having the carriage body attached via suspension springs. Twisting loads on the pivot pin are supported by a fifth-wheel, which has two horizontal wheels on top of each other, the bottom one attached to the front assembly and the top one to the rear assembly. The fifth-wheel halves rotate against each other at a greased face, to support vertical loads and twisting of the rear axle relative to the front axle. (There is a claim that the fifth wheel was invented by an Amesbury carriage blacksmith named Isaac Osgood.)

Having little cargo, these structures and the body are made very light, for a high strength-to-weight ratio, and comfort of the horse. Human comfort is attended to by suspension springs and upholstery. Beyond that, there developed over time additional features that we would expect today.

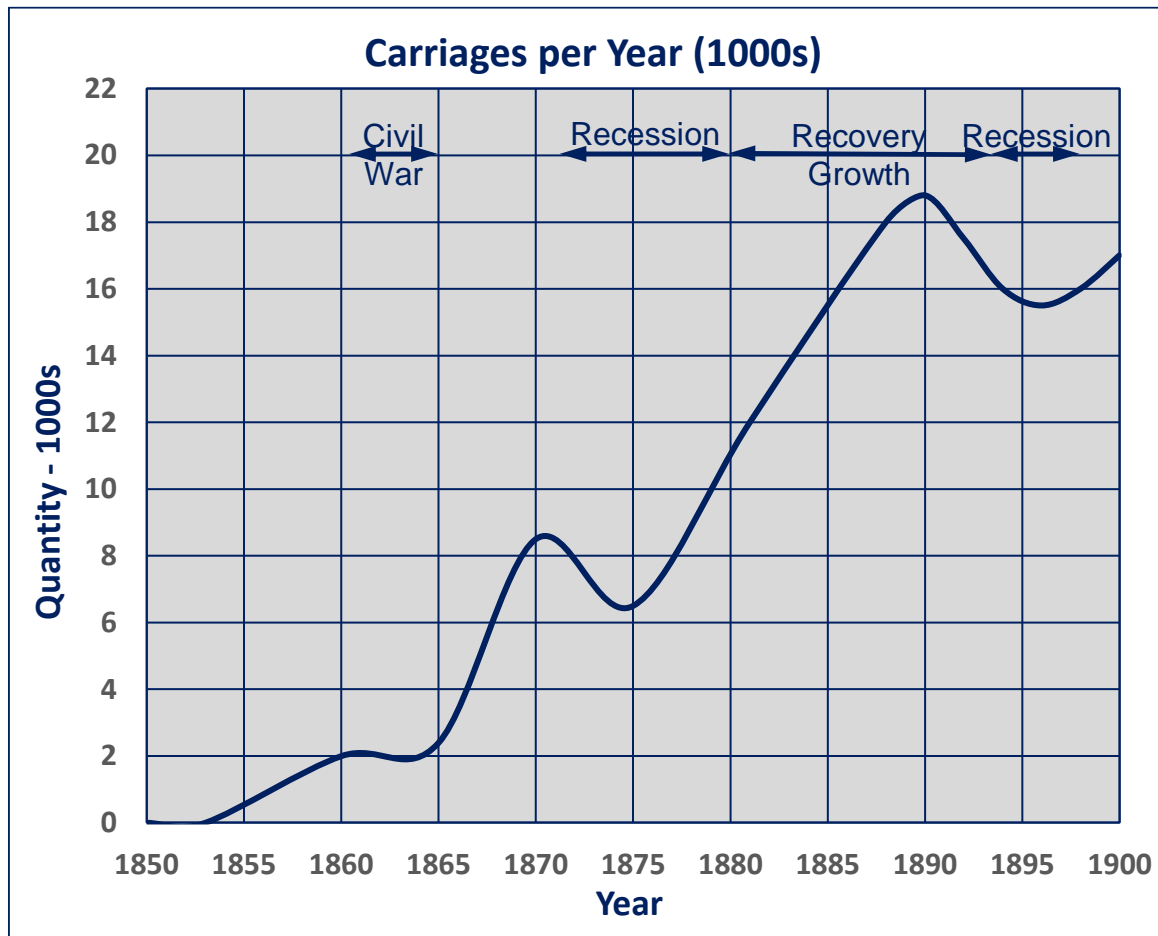
Traditional wheels had iron rims that clattered along cobblestone streets. By 1890 there were solid rubber tires that both softened the ride and eliminated noise, which were soon followed by more effective air-filled rubber tires. Rubber tires attached to specially shaped iron rims, as rims were still structural parts holding together wood spoke-and-hub wheels. The advent of formed steel rims and wire spokes for bicycles, ca. 1890, presented carriage wheels that were lighter and cheaper, while still strong. Simultaneously came roller and ball bearings, bringing increased smoothness and noise reduction. Dudley J. Marston's Pneumatic Gear Co. of Amesbury combined in 1901 with the Chicago Screw Co. and its Empire Bearing and Axle Co. to provide high-tech undercarriage assemblies under the company name of SAFE, Standard Anti-Friction Equipment Company.





# Rising Amesbury Carriage Production

Starting in 1853, Amesbury carriage making immediately met the Panic of 1857 and then the Civil War. Ensuing post-war prosperity promoted growth until the long recession of the 1870s, which was such that one of the major makers, Felix D. Parry, closed for several years in the late 1870s. Finally, there were a dozen prosperous years during which carriage making reached its peak. But, even before another major downturn gripped European and American economies, Amesbury was suffering from stiffer Midwest competition and high freight rates in shipping from the east to the south and west. During 1895-6, Biddle & Smart shut down for a time, accounting for thousands of lost carriage units. They had financial reserves, but could only support partial operation, which was costly and inefficient. Production for that period may have dropped more than is shown here.



Estimating carriage production is difficult, with sparse data sometimes being contradictory. It is unclear how well it was tallied even at the time. This data was extracted from several years of manufacturers' data (1870, 1875, 1880, 1888) and from figures quoted in Royal Feltner's compilation book<sup>1</sup> of *Hub* magazine trade articles.

Annual production reached into the 19-thousands, notable for rural town of about 8000 population.

1) *History of Amesbury Carriage Makers*, Royal Feltner, Amesbury

# The General Nature of Amesbury Carriage Making

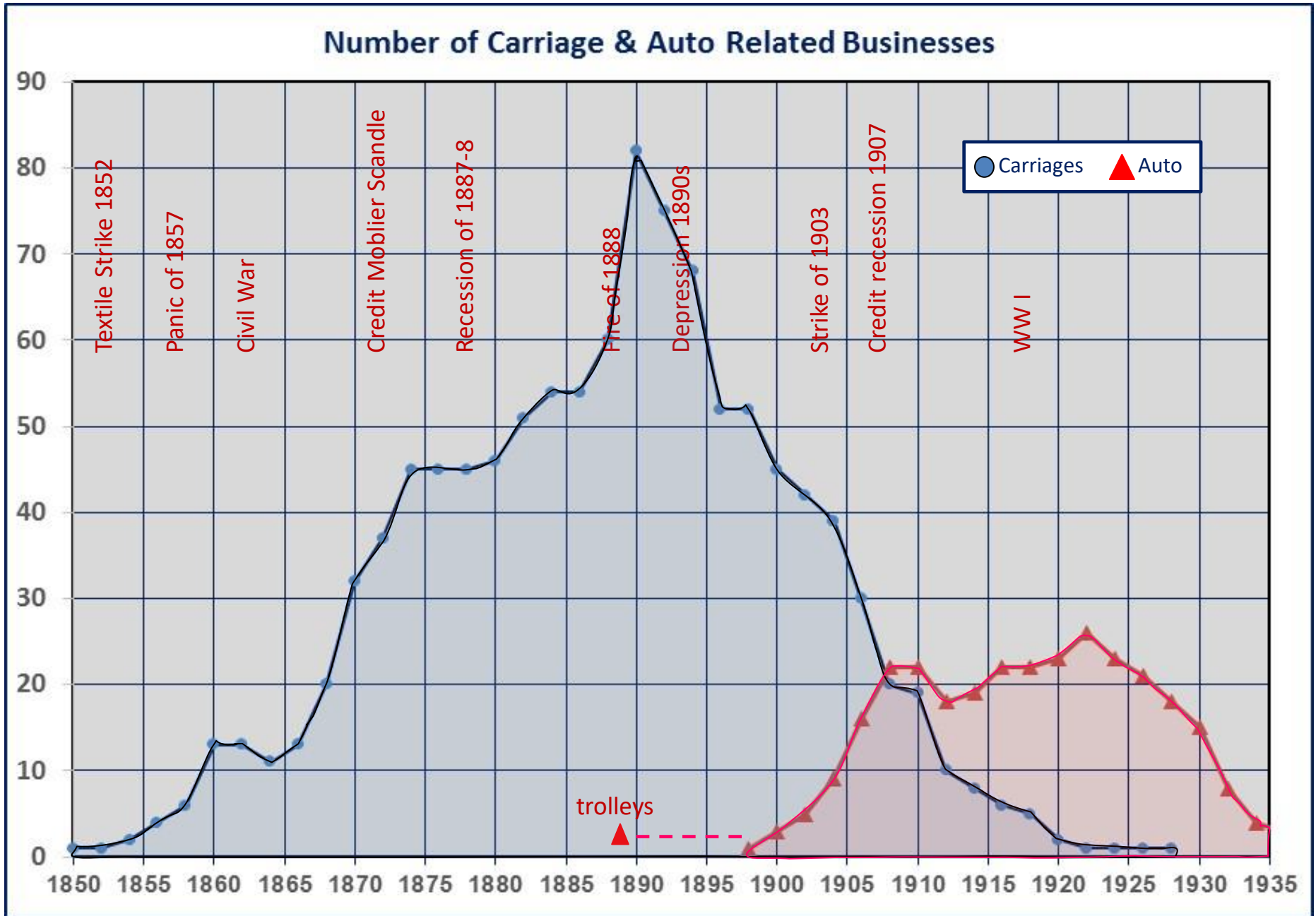
Amesbury makers used readily available components and farm-out services. Wagon and carriage making of the 1880s was a nation-wide industrialized business having substantial commodity suppliers for such heavily technical components as precision iron axles and journal boxes, springs, clamps, nuts, bolts, and step forgings. These were distributed by several large carriage hardware suppliers in town, springs being the main item perhaps also produced locally from standardly available rectangular section steel stock. There was frequent discussion during the 1880s that Amesbury needed a producer of axles and springs, which it never got. Hardware suppliers also carried fine interior trimming fabrics and leathers. Some leather was produced in town by several makers, mainly for folding carriage tops, fenders, and dash panels, where fenders and dashes were iron frames covered typically in patent “enameled” leather.

There was a group of carriage wheel producers in Amesbury having steam-powered factories, several of whom also made “gears” or undercarriages. About all carriage makers except the two largest (who also made wheels) purchased wheels from suppliers, and gears were commonly purchased. Several other shops would “iron” carriages as a specialty, eliminating forges and blacksmiths for some makers.

There was also a group of (unfinished) carriage body makers, at which point all major carriage sub-assemblies (bodies, wheels, and gears) were available for purchase to compile starter “kits”, some assembly required. Another version of the “carriage kit” became the entire carriage lacking finishing, painting, and trimming. Two companies that shifted to this business were Currier, Cameron, & Company who sold carriages “in the white”, and Miller Brothers who sold carriages “in the wood and iron”. These could provide “fill-in” products to diversify offerings from shops that otherwise made their own carriages. On a national scale, Amesbury wholesale carriages were purchased by other shops across America to likewise expand their product lines, especially in the higher grades. Amesbury consequently had the reputation of a “boutique” source of vehicles that later facilitated its transition into a comparable source of upper end auto bodies.

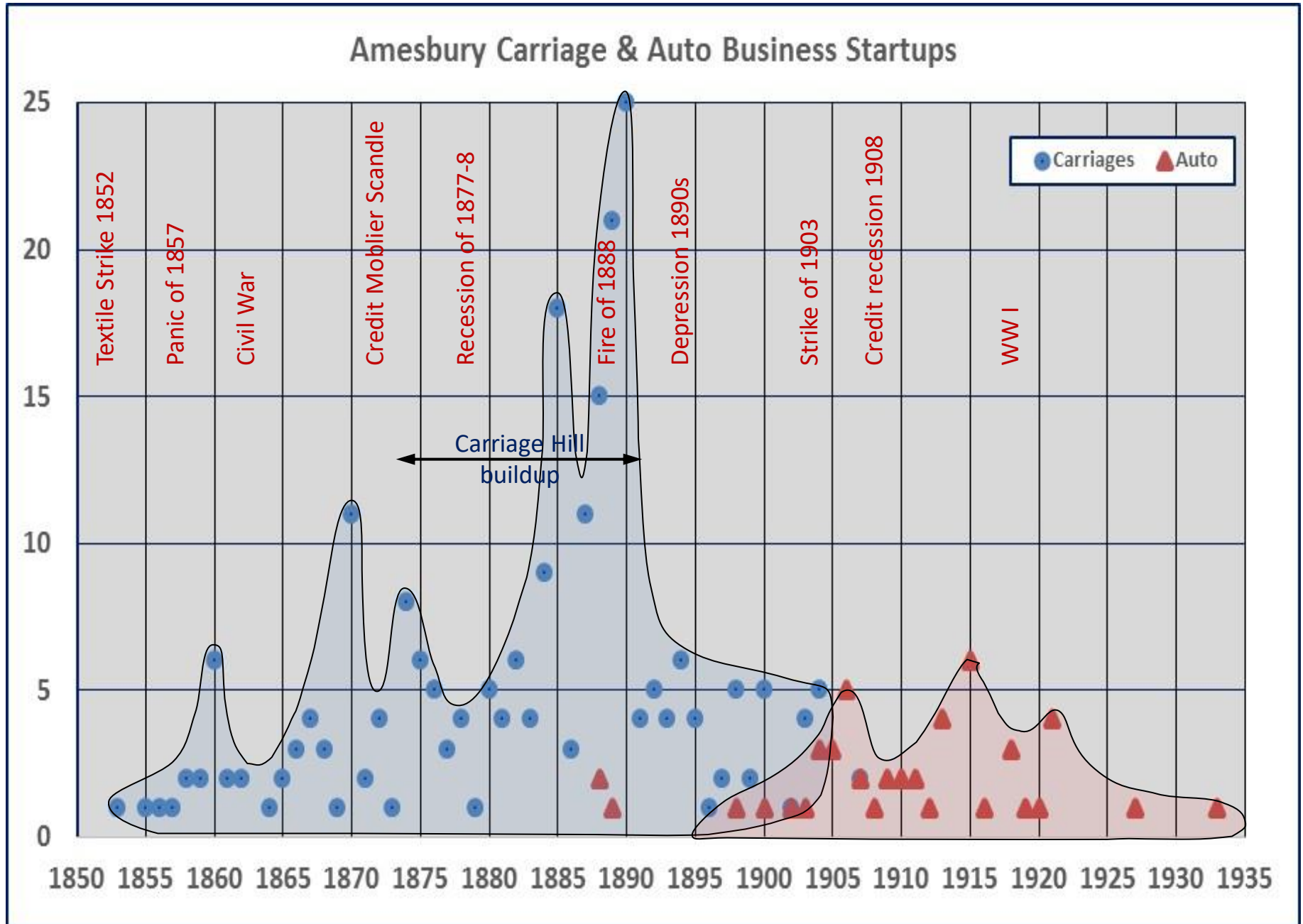
# Quantity of Carriage and Auto Body Business Entities

Carriages & Auto bodies plus related supporting businesses



# Carriage and Auto Body New Business Startups

highly responsive to general economic conditions

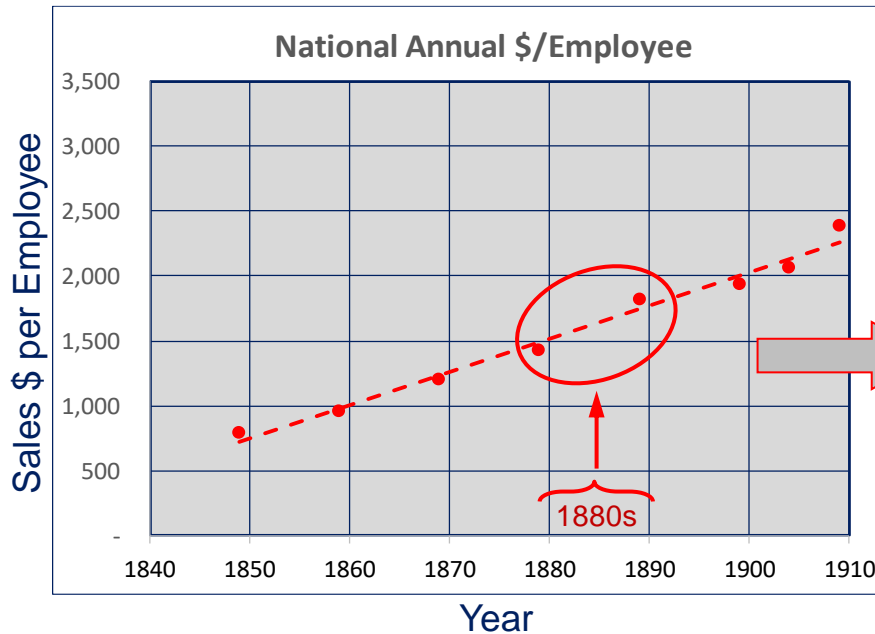


# Annual Sales \$/Employee – Local vs. National Trend

Amesbury 1880 and 1889 carriage data compared to national trend

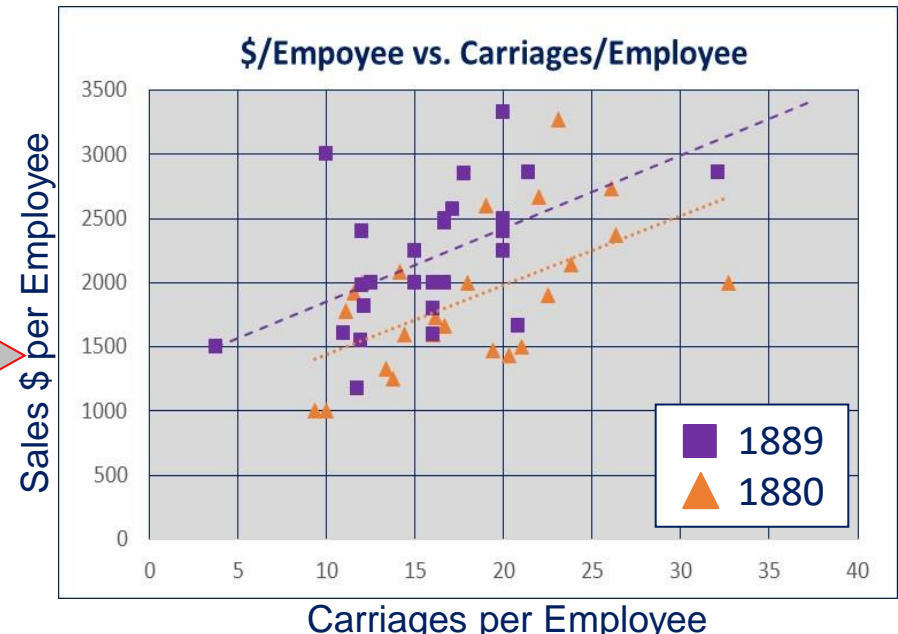
The national trendline for thousands of then-existing wagon & carriage companies rose over the decades, driven by industrialized factories using widespread heavier machinery. Amesbury Sales-\$ per employee matches the national trend and Amesbury makers had generally increased Sales-\$ per employee in 1889, over 1880, by moving up-market as lower carriage grades were encroached upon by industrial makers.

## National Average for Sales \$/Employee



National average includes data for both carriages and wagons, and companies both large and small. There would actually be considerable scatter about the trendline. Kinney, pg. 34

## Amesbury 1880 & 1889



Amesbury sales \$ per employee matches or exceeds the national trend. Shops that produce more carriages per employee naturally produce more sales \$ per employee.

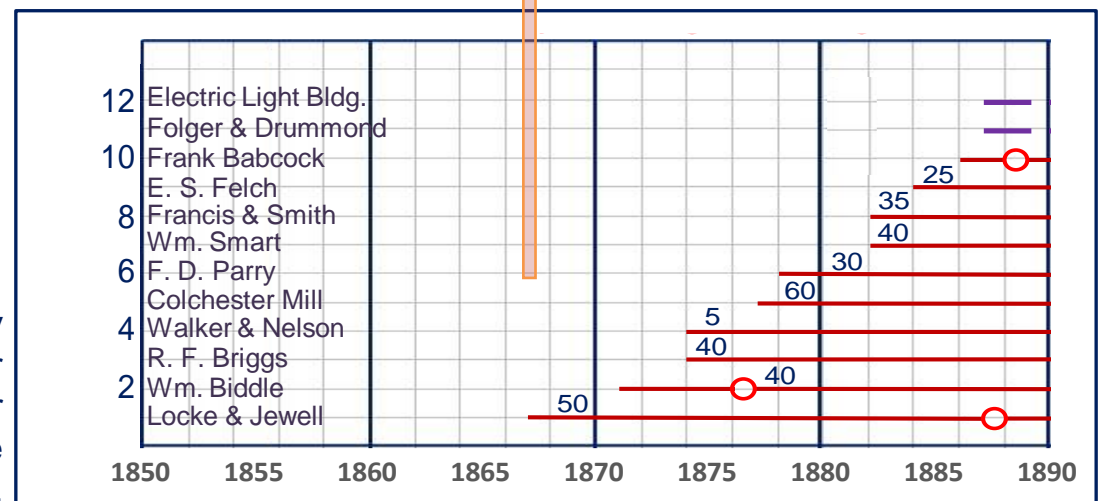
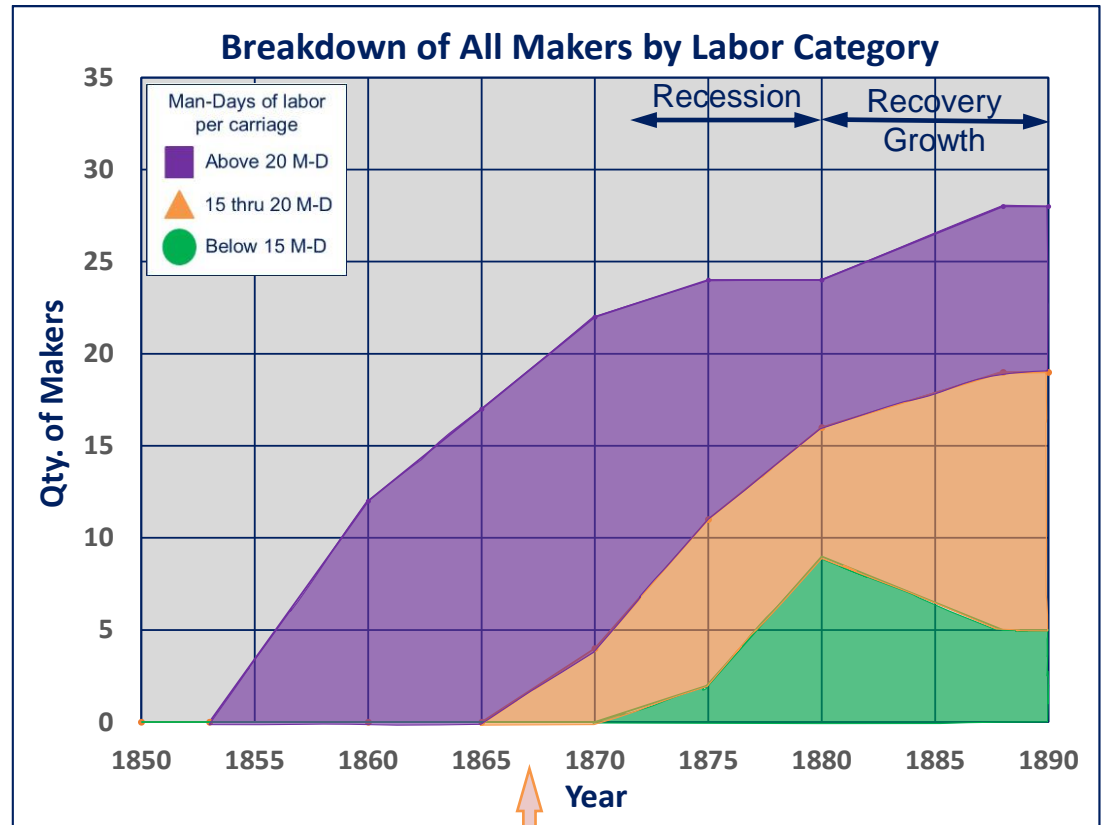
Amesbury data fits well with the National trend for the 1880s. Amesbury carriages are more expensive than the national average, yielding higher sales \$ per employee. 1889 sales \$ per employee has risen, compared to 1880, as Amesbury moves up-market.

# Labor Content Falls as Horsepower Rises

Steam horsepower supplied the brute force effort of reducing logs to lumber and then to sized and finished components. Growth of middle and lowest labor tiers paralleled the rise of carriage trade steam power, with its options of what to purchase rather than make in-house. Economy of scale was concentrated in the powered shops and then radiated outward to other makers in the form of ready-made sub-assemblies. Middle and lowest tier shops had lower direct labor because they had purchased labor-laden sub-assemblies..

Lowest tier peak population resulted from the slow 1870s economy, as makers shifted to low-cost methods in order to survive. After 1880, high-volume makers could continue purchasing sub-assemblies but could also shift to middle tier labor levels to produce finer more expensive carriages having a market in the recovery economy. The industry grew to around 400 total horsepower.

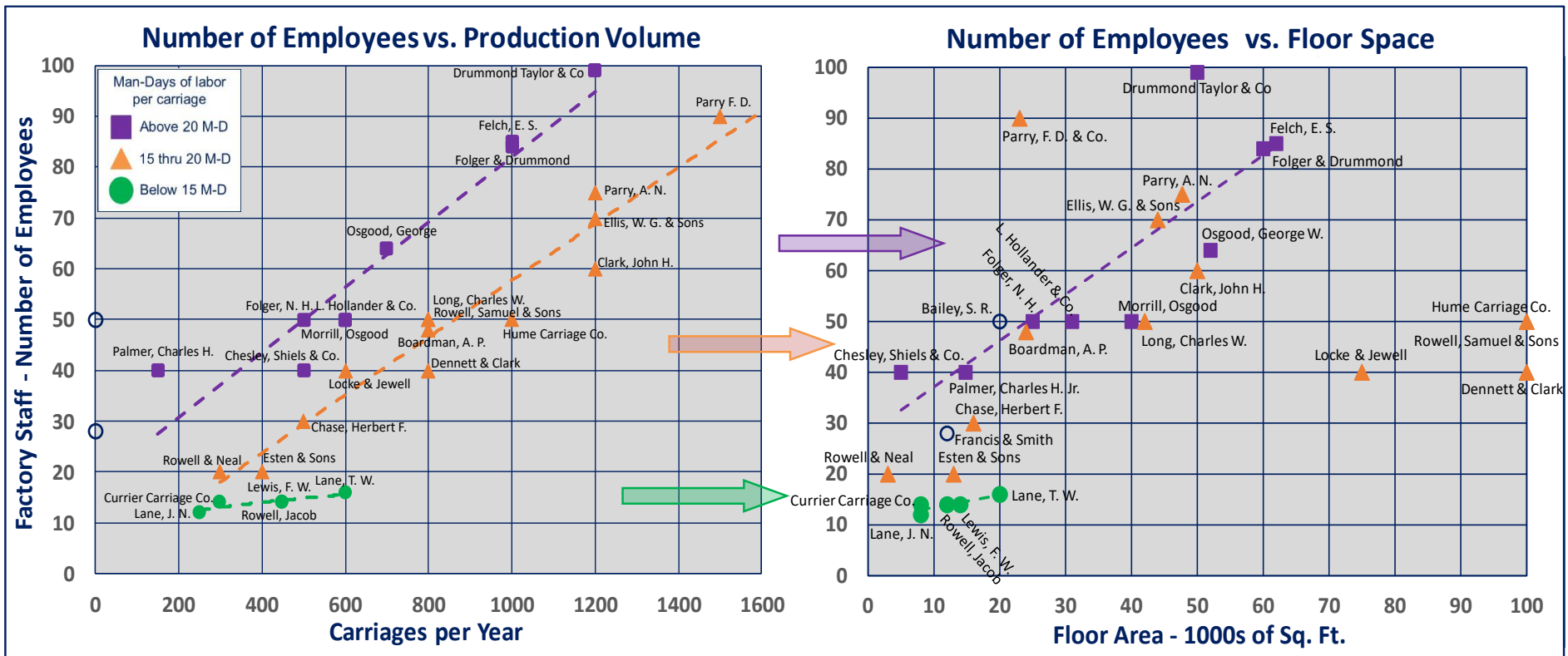
Steam engines entering the Amesbury carriage trade are listed at right, with their horsepower. Red circles represent fires, after which rebuilding included new engines. Blue lines, at top, represent electric power.



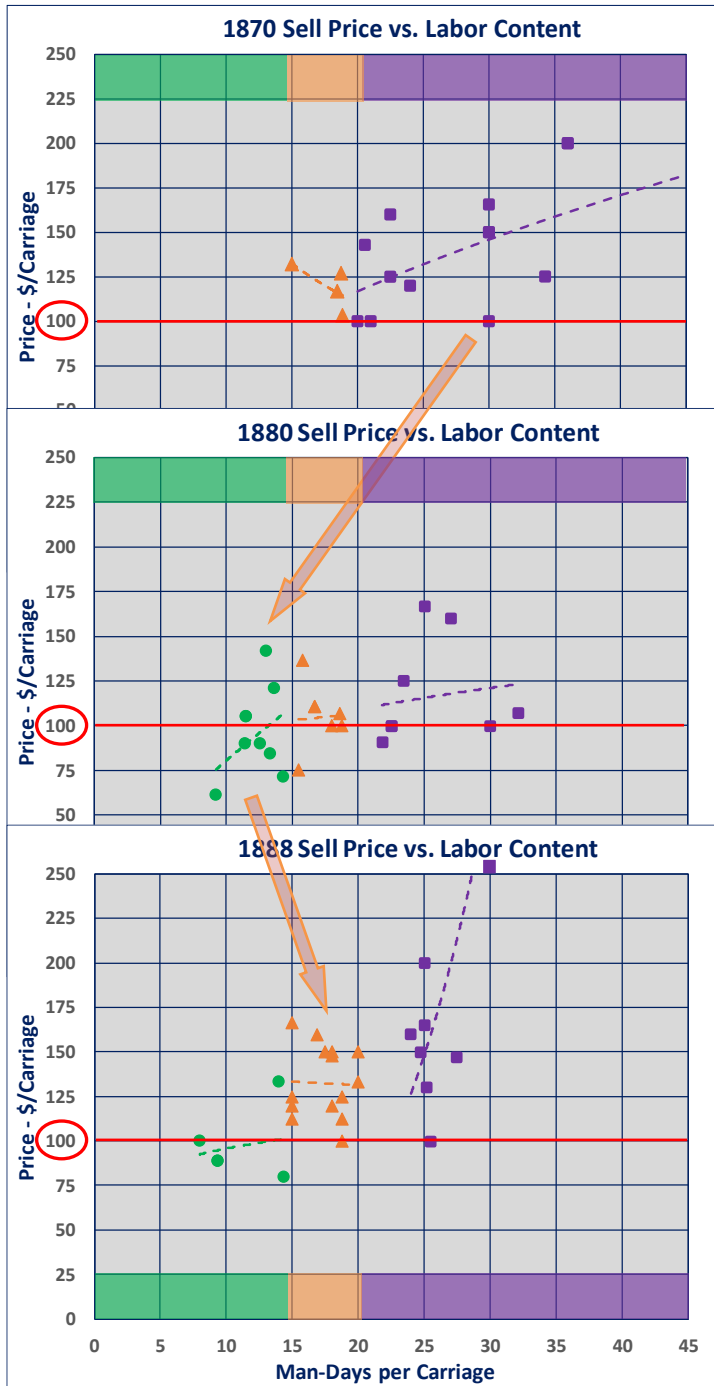
# 1888 Manufacturing Resources vs. Production Volume

At left, below, shows employment vs. production volume (excluding several larger powered makers) At right is employment vs. floor space. Lowest labor-tier shops are small, lacking the resources to benefit directly from economy of scale or division of labor. They inherit economy of scale in their purchased material. Middle tier factory space varies from very small to notably over-capacity for several reasons. A few have additional space devoted other purposes, such as machinery making. Several others are new companies formed after a major fire that year, and have not yet filled their spaces.

Lowest tier makers work from minimalist shops of less than 20 thousand square feet and only 16 or fewer employees. Without benefit from economy of scale, they use a modest low-cost business approach as carriage finishers. Notable is the shallow slope of their employment line vs. production volume, implying only one additional employee for each additional 100 carriages per year, making obvious that such shops are not physically making complete carriages in-house.



# Economic Trend of Sell Price vs. Labor Content



**1870**

Compared here are eighteen years of sell price (mostly wholesale) vs. man-days of labor per carriage, with the \$100 price point noted by horizontal red lines. This conveniently spans shifting market demand as the economy enters 1870s recession and then recovers into a booming 1880s. The number of data points in each category shows how the carriage company population is distributed in each period. Orange arrows between graphs show shifts in the most populated group. Most makers in 1870 still have high labor input because that is how the classic trade had operated up to that time. The highest labor input was about 37 man-days, and nothing was selling for under \$100. There is a small new group of middle tier makers.

**1880**

In 1880, just as Americas longest recession ended, most makers resided in the lowest labor tier in order to survive, with numerous offerings under \$100. In that regard, steam power had been a literal life saver for the local trade. In addition, the highest labor content had dropped to about 32 man-days, and nothing was priced above \$175, with only two makers above \$150.

**1888**

With strong 1880s markets, makers upgraded to the middle labor tier with virtually all average prices per maker above \$100. Prices stretch upward with a variety of makers above \$150 and on up to \$400 (off the chart), while the highest labor content has dropped again to 30 man-days. A few lowest tier shops still satisfy ever-present demand for sub-\$100 vehicles.



# First Car to Climb Mt. Washington - 1899

Freelan Stanley, with wife, Flora, driving their primitive car up an eight-mile climb of Mount Washington, New Hampshire, a rise of 4,600 feet. Adding some risk, the top of Mount Washington still holds world wind speed records, and there are tales of summer days turning to blizzards. The car is essentially a 1890s carriage, many of which then had steel frames, roller bearing axels, and pneumatic rubber tires, as seen here. Freelan is one of the twin Stanley brothers, and this is one of their early steam Locomobiles, many Locomobile bodies having been made in Amesbury.



# Amesbury Carriage Making Meets the Automotive Era

Amesbury's carriage business had not been not a heavy "smokestack" industry in either methods or magnitude. For instance, carriage makers were locally capitalized, whereas Amesbury's earlier industrial textile manufacture rapidly became controlled by larger outside investors. In other words, the Powow River's industrial waterpower was priced beyond Amesbury's reach, while carriage making methods were matched to local financial resources. In contrast, some large industrialized carriage factories in the Midwest, such as Durant & Dort (founders of General Motors) and Studebaker, each had annual production comparable to that of all Amesbury makers combined. In the overall scale of consumer manufacture, automotive technology, as with textiles, quickly advanced into industrial and economic realms where Amesbury could not follow.

Completely missing from Amesbury carriage production had been casting, forging, and machining of such iron/steel components as axles, wheel journal boxes, suspension springs, fifth-wheels, large brackets, footstep brackets, and fasteners (threaded nuts & bolts). These components were made available from outside industrial suppliers through carriage hardware purveyors such as Charles Wing on Water Street and John Poyen of Elm Street. The main machinery maker was Pettingell Machine Co. with their foundry on Mechanics Row, making specialized wood-working machinery for carriage wheel makers. After being burned out a second time in 1891, they moved to Lawrence, Massachusetts, returning to Amesbury in 1905 as a specialized maker of formed sheet metal automobile panels and automatic power hammers for forming them. Local industry otherwise substantially lacked sophisticated metal-working machinery and expertise, especially along lines of precision machining and complex machine assemblies such as engines.

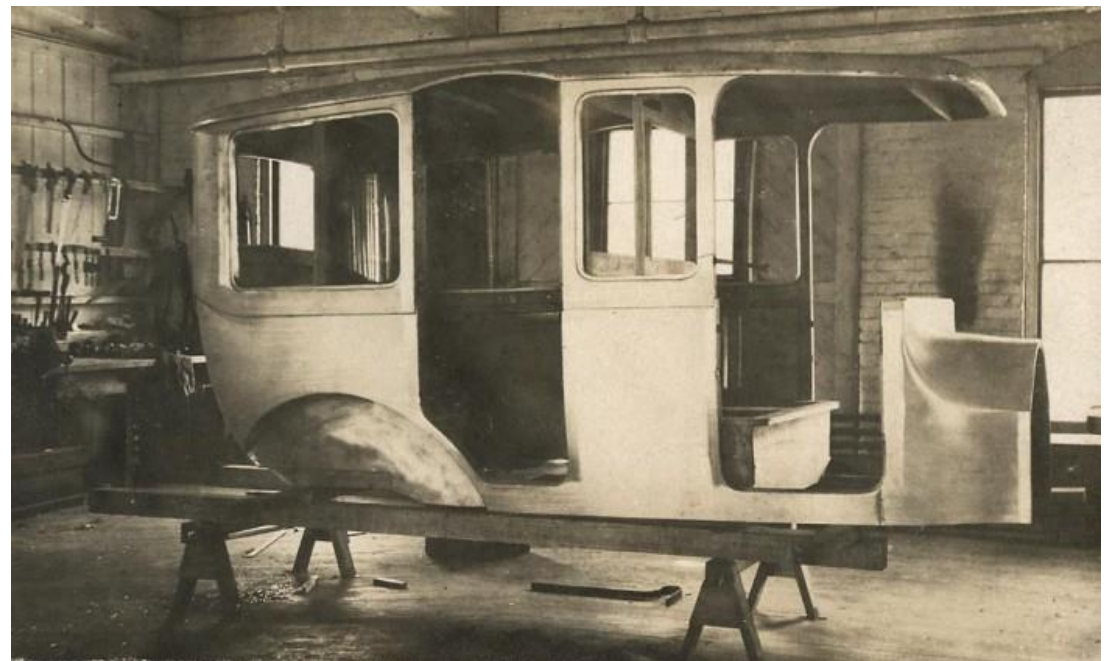
As opposed to carriage wholesaling, auto body manufacture constituted custom work tied to specific automobile makers. This was occasionally precarious, as when the Stanley Steamer bankruptcy was also the demise of Currier Cameron & Company, but sufficed for its time.

# Where Amesbury Fit into Automobile Manufacture

Traditional carriages comprised three major wooden sub-assemblies: bodies, wheels, and gears, the latter being undercarriages supporting bodies on steel-spring suspensions. In Amesbury, this reduced to making solely bodies during the automotive era. Early auto bodies were virtually carriage bodies. Even as they became more “automotive” in style bodies long remained wood structures, perhaps sheathed in aluminum or steel, and then eventually all-metal assemblies.

Carriages had been of intentionally light-weight while autos were inherently heavier, having engines and drivetrains. Between their weight and higher speeds, autos suffered far higher impact loads from bumps, ruts, and rocks in dirt roads (rolling over these was why carriage wheels were so large in diameter). Such heavy-duty service drove automobiles to a strong steel chassis supporting its weight on correspondingly strong wheels and suspension. This was the primary automotive technology, under a body functioning an attractive passive shell that was ergonomically convenient for driver and passengers. Core automotive technology departed from Amesbury’s woodworking past in its design requirements, production methods, and capitalization level.

A custom enclosed aluminum auto body being made at Pettingell Machine Co. in the building still extant at 77 Elm Street, where John Poyen had previously had a carriage hardware business. Other body companies had larger orders filled using more productionized methods.



# Wood Frame Auto Bodies



Hand making wood auto body structural frames in what appears to be a small production shop, ca. 1920s. While unibody concepts were understood (akin to monocoque aircraft construction), the auto industry long continued using independent bodies on separate chassis to facilitate frequent body style changes, while the remainder of the automobile remained relatively unchanged.

# Automotive Customers for Amesbury Body Makers

Having early moved headlong into this sector, there was a claim that ca. 1910 Amesbury was the world's largest producer of auto bodies. Whether or not true, it was a significant business. The town was eventually shipping around 40,000 bodies per year, although at that time, perhaps 1920, there were major Midwest companies making 100,000 consumer-grade bodies annually. The latter was a large capitalization industry where Amesbury could not compete. Below is a list of body companies and their automotive customers<sup>1</sup>.

|                              |   |
|------------------------------|---|
| Amesbury Body Co.            | Haynes of Kokomo, Indiana & Holmes of Canton, Ohio  |
| Amesbury Reed and Rattan Co. | Corbin of Cleveland, Ohio   |
| Bela Body Co.                | Winton  |
| Biddle & Smart               | Winton, Packard, Peerless, Thomas, Pope-Hartford, Haynes, Ardsley, Cole, Mercer, Hudson, Rolls-Royce, American Berliet (Alco), New Departure, Connecticut (taxis) |
| Bryant Body Co.              | Jordan  |
| Clark Body Co.               | Buick, Oldsmobile   |
| Currier Cameron Co.          | Locomobile, Stanley Steamer, Mobile Steamer   |
| Howarth & Rogers             | Ultra   |
| Lambert Hollander            | Cadillac, Maxwell-Briscoe, Pierce-Arrow   |
| Hume Carriage Co.            | Grout   |
| Miller Brothers Co.          | Turbiner Cab Co.  |
| Shields Carriage Co.         | Stanley Steamer   |
| Walker-Wells                 | Franklin Car Co., Studebaker, Holmes Air Cooled   |

In addition to these were specialized shops making lamps and headlights, shaped glass, hinges, brackets and fasteners, seats, cushions, leather tops, various small castings, entire centralized carbide and/or electric lighting systems, and electric starters not long after Kettering & Deeds 1911 DELCO starter for Cadillac. There were even flower holders, while other shops specialized in painting and interior trimming.

<sup>1</sup> Automobile Body Builders of Amesbury, K. Doubleday, Whittier Press, 2006

# Bailey Manufacturing Co. Felt-Lined Window Channels

Carriage & sleigh maker, Samuel R. Bailey, started in rented space at 79 Elm Street. After the Carriage Hill fire of 1888, he rented space there in a large new factory, which he purchased in 1903, producing a sample automobile for the Essex Steam Car Co. in 1906. He soon took up manufacturing an electric automobile, with technical help from Thomas Edison, who was trying to develop practical auto batteries and charging stations (Edison & Bailey electric below). By 1915, electric autos succumbed to the competition of gas and steam engines, so that S. R. Bailey & Son ceased operations and sold their factory to Biddle & Smart.

The son, Edwin, experimented with new ideas, developing the design and manufacturing techniques to make felt lined window channels for sliding retracting windows in automobiles. (likely aided by a local industry in felt hat making). Fundamental forming of the metal channel was accomplished by running a metal strip through a series of formed rollers, an outgrowth of having similarly made metal rims for wire-spoked rubber carriage wheels. He productionized to full-scale manufacture in Mill 8, on Main Street, and after outgrowing that, moved to larger quarters in Mill 14 & 14½. The company expanded to Mill 2 and other local buildings, including the old hat factory, before moving to nearby Seabrook, where they continued into the 1970s. They were Amesbury's longest-lived member of the automobile industry.



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# The Merrimac Hat Company



The 1878 Merrimac Hat Company factory still extant along the banks of the Merrimack River. (There is considerable looseness as to when the word "Merrimac" is graced by a "k" at the end.) The factory operated with a 100 HP steam engine because the river is tidal at this location, having no drop that can provide power.

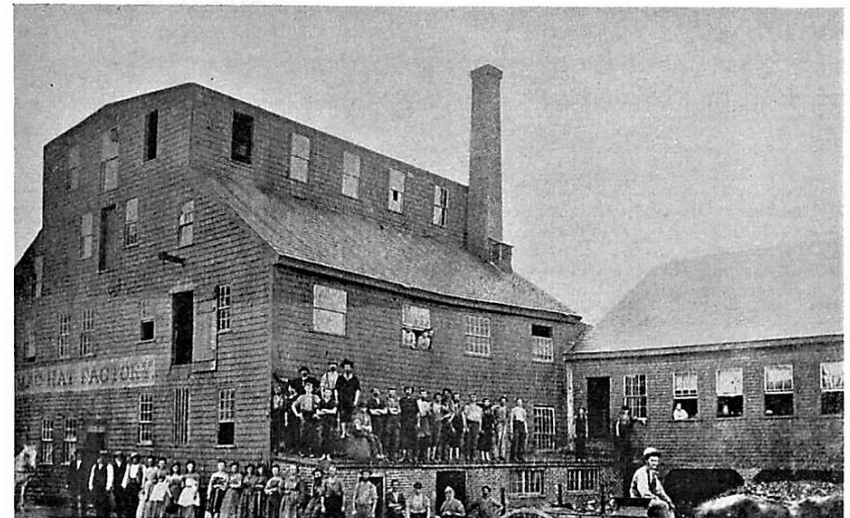
# Local Hat Making Background<sup>1</sup>

Hat making began in 1767 with Moses Chase making hats of both felt and the tall beaver style then popular<sup>1</sup>. The flourishing business including shipments to the West Indies in what was likely a cycle of importing rum in return, rum then functioning somewhat as an area medium of exchange. Several other hat makers joined a small community in the trade, and Chase's hat business was later assumed by Orlando S. Bailey. The trade originated and remained in the old Point Shore neighborhood near the Merrimack River for an ample water supply that was central to felting and hat-making processes. This was also the original town center where the old money still resided.

Orlando's son, Abner Lowell Bailey, started independently making hats in 1846 in partnership with his brother-in-law, William Swett. They equipped a cooper's shop with needed gear and, while Swett exited the venture, Bailey expanded in 1851 to a second location up near the current hat factory. The 1850 manufacturers' census listed Abner's shop as an unpowered business with six employees making 15,000 hats annually, built on a \$2000 investment. Abner merged in 1856 with other Point Shore investors to create the Merrimac Hat Co. in their steam powered wood mill along the river, opposite Edwin Morrill's carriage factory at Laurel Place. The firm merged in 1863 with an adjacent competitor, the Amesbury Hat Company, and in 1866 with their last, Horton Hat Company.

Abner Bailey had built the large pond across from today's factory as a dependable source of clean water, and the existing factory opened in 1878. There were brief forays into rugs and straw hats, but their focus remained hats of wool and occasional other furs, such as rabbit. Aside from a few closures because of supply problems during World War I the company remained prosperous for decades.

1) Hat making history is largely from several town historical summaries plus articles in the Merrimac Hat Company magazine, *Making Headlines*, from 1939 and 1944



Original wood-mill hat company factory



# Growth and Boom

Merrimac Hat Company annual sales after World War I were running a bit over a million dollars, with solid earnings, such that a major reorganization occurred in 1920 that created the new Merrimac Hat Corporation. This immediately took over Ayer-Houston Company in Portland, Maine, purchasing in 1925 a half-interest in William Knowlton & Sons in Upton, Massachusetts, while selling the Maine facility. Separate outside selling agents were contracted for men's and ladies' hats. As the 1920s roared, they were also paying employee bonuses for overtime and efficiency. Having grown beyond the capacity of the Merrimac and Knowlton factories, they purchased in 1929 one of the Amesbury brick buildings of the former Richard F. Briggs carriage complex on Cedar Street, adjacent to Clarks Pond, that remains today as condominiums. Little slowed by the 1929 Crash, sales continued to demand additional capacity. Auto body making had then imploded, so that the long wood factory building across from their Cedar Street plant, lately vacated by Biddle & Smart, was purchased in 1934. As the Great Depression gradually abated, they purchase in 1935 a two-thirds interest in the Dutchess Hat Works of Beacon, (Dutchess County) New York, a regional hat making center. Merrimac Hat Corp. was also establishing subsidiaries to sell hat bodies for trimming and finishing by other makers and was prospering into World War II, reputedly as America's largest hat maker.

Beacon, New York factory



Merrimac Hat Factory (Formerly Tioronda Hat Factory), Looking West, c. 1940

# Post War and Doom

Prior to World War II the volume of men's hat production was several times that of ladies' hats. Post War America then entered a new world of both increasing foreign competition and more casual lifestyle in which men increasingly ceased wearing hats at all. The Beacon, New York factory was sold in 1948 to Atlas Fibers Company for fabric recycling and the Merrimac Hat Corporation began scrambling for survival. Sometime around 1950 their main factory along the river was leased or sold to Bailey Manufacturing Company (see note) making felt lined window channels, leaving Cedar Street as their only remaining facilities. Operations ended entirely in 1970.

Note – The hat making Bailey (or Bayley) family is among Amesbury's oldest, Salisbury Point once being known as Bailey's Point. The carriage and window channel Bailey family stems from Samuel R. Bailey, a Maine sleigh maker who occupied in 1882 the new factory on the site of the former Elm St. steam mill that had just been purchased and redirected into carriage related businesses.

Merrimac Hat Corp.,  
1944, with the river  
behind and Bailey's  
Pond in front.



# Other Industries, Building Loss, and Isolation

Two steam-powered textile mills were built during the Civil War era, following the Newburyport model, one on Elm St. and the other on Main St. at the current Post Office location. The former was leasing powered workspace to other businesses by the mid-1870s, then was purchased and converted in 1882 to solely carriage and later auto body work, while the latter burned from a lightning strike the following year. For the last quarter of the 19<sup>th</sup> century and into the 20<sup>th</sup> there was a steam powered grist mill on Railroad Ave. that shipped grain and products to and from Boston. During much of the 19<sup>th</sup> century and into the 20<sup>th</sup> a series of about ten shoe and shoe related companies rotated through town, many in the 19<sup>th</sup> century being unpowered but increasingly using foot treadle sewing machines. Several were making wood or leatherette heels, likely serving major shoe companies in nearby Haverhill. During the middle 20<sup>th</sup> century, Lewis Shoe Co. occupied a long wood three-story building that had formerly been part of the Biddle & Smart brass foundry, the building later being demolished in 1979 as unsafe.

Early carriage factories, scattered through neighborhoods, had rapidly been overrun by housing during the 1890s, while later centrally-located factories were wiped out by the Depression, eliminating most carriage and auto era architecture. Textile mills were surviving by various means after 1930, but, carriage-auto-body buildings, with a patch-work of bankrupt owners, were languishing. Those that did not burn became town property by tax title action, the new landlord being equally unable to fill or maintain them. Most were demolished during the 1940s.

Dying factories took their jobs with them. Railroad passenger service ceased during the mid-1930s and the rail spur became virtually unused. A bus service was apparently initiated to Portsmouth, New Hampshire for work at America's oldest Navy Yard. Some auto body workers moved to Framingham, where they were well-received by auto factories there. The only access into and out of Amesbury was on old US Route 1 up through the coastal towns and then across Elm Street. Amesbury was relatively isolated until the state built an alternate Rt. 1 close by during the early 1950s (later becoming Interstate 95), joined by Interstate 495 in the late 1950s, reversing fate and making Amesbury conveniently accessible by road today.