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VOL. I, No. 1

OCTOBER, 1915

Smith College Studies in History

JOHN SPENCER BASSETT
SIDNEY BRADSHAW FAY

Editors

AN INTRODUCTION TO THE HISTORY OF CONNECTICUT AS A MANUFACTURING STATE

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A Thesis presented to the Faculty of Smith College
in candidacy for the degree of
Master of Arts

NORTHAMPTON, MASS.

Published Quarterly by the
Department of History of Smith College

INTRODUCTORY NOTE

In this study I have attempted to trace some of the steps by which Connecticut has changed within the last hundred years from a loose collection of largely isolated and nearly self-sufficing rural communities into a highly organized manufacturing state, importing a very large proportion of its food, and sending its manufactured goods to every corner of the world. This is not a history of manufacturing in Connecticut, on either the technical or the economic side; but it is hoped that the work may show how valuable would be a fuller and more adequate presentation of the economic development of one of the New England states.

My investigation was carried under the direction of the late Dr. Guy S. Callender, professor of Political Economy in Sheffield Scientific School, Yale University, until his death in August, 1915. I desire to acknowledge courtesies extended to me by the Yale University Library.

G. P. F.

New Haven, Conn., October 23, 1915.

An Introduction to the History of Connecticut as a Manufacturing State

CHAPTER I

CONNECTICUT BETWEEN 1815 AND 1820

At the present time Connecticut ranks fourth among the states in density of population.¹ Among her 168 towns there are (1915) three cities of more than 100,000; she has fifteen cities and twenty-one incorporated boroughs. The towns range in population from New Haven with (1910) 133,605 to Marlborough with 302.²

According to the United States Census Report on Manufactures for 1900-1905,³ Connecticut produces 80.7% of all the rolled brass and copper made in the United States, 72.2% of the ammunition, 69.4% of the clocks, 66.9% of the plated ware, 51.6% of the brass ware, and 46.9% of the hardware. The following table shows the extent to which the country's production in the given industries is localized in cities of this state, and also the specialization in the industry within the city.

	Localization by Cities		Per Cent. of Specialization
	1905	1900	
Waterburybrassware	42.2%	46.8%	28.8%
Meriden.....plated ware.....	40.1	45.6	28.7
Bridgeportcorsets	19.9	22.3	
New Britain.....hardware	15.5	16.2	51.4
Danburyhats	15.8	18.0	75.1

¹ Density: Rhode Island, 508.5; Massachusetts, 418.8; New Jersey, 337.7; Connecticut, 231.3; New York, 191; Pennsylvania, 171. (U. S. Census 1910).

² For convenience of reference to the population of Connecticut at different times, I have used the Register and Manual of Connecticut for 1914, pp. 634-638: "Population of Connecticut by Towns, from 1756 to 1910. Compiled from official returns." Special reference to this table will not be made on later pages of this study.

³ U. S. Census, 1905. Localization of Industries. Pp. cclv.-cclxii.

All this is very different from the state of affairs in the second decade of the nineteenth century. Yet even a hundred years ago a beginning had been made in each of the industries in which Connecticut now takes first place among the states. The beginnings were so small in some cases that if we did not know to what they have grown we might never notice them, but already in 1818 Connecticut was known as the land of steady habits, the home of "Yankee notions," clocks, and tinware. Her people were noted for their spirit of industry and enterprise, and for the spirit of traffic which had led thousands of them abroad, where they were to be found all through the South vending tinware and the clocks.

For the study of her manufacturing interests we are fortunate in having two good sources of information for the early years. The Connecticut Academy of Arts and Sciences, organized in 1801, essayed to produce a *Statistical Account* of every town in the state. It addressed a circular letter to the clergymen of the different towns. The list of questions was so comprehensive that we may surmise that it discouraged most of the men to whom it was addressed. However, in 1811, the Academy was able to print an account of New Haven that had been written by President Dwight of Yale College. A few years later the Academy published an account of several of the towns in Litchfield County and one of Middlesex County.

We do not have to depend, however, upon the Connecticut Academy for a complete survey of Connecticut. The Pease and Niles *Gazetteer of Connecticut and Rhode Island*, published in Hartford in 1819, was compiled from first-hand information received from the towns direct. The compilers used the *Statistical Account* so far as it went. For the rest of the state they visited every county and nearly every town, and, as they tell us in the introduction, "a circular letter specifying the several subjects upon which information was requested has been sent to one of the most intelligent inhabitants in every other town."⁴ They add, "We are sensible that the information obtained in this

⁴ P. and N. Preface, p. iv.

mode may in some instances have been erroneous; but considering the respectable source from whence it has been derived, we have no doubt but that in general it will be found correct."

This *Gazetteer* is particularly useful to us, not only because it is made up of first-hand information, but also because the unit studied is the logical one, the town, and not the arbitrary county division followed in the United States census. We are given in the *Gazetteer* a detailed account of every town in the state: we know the nature of its soil, its physical features of interest, its manufactures, its size, its assessment, and its history. The compilers of the *Gazetteer* believed that in manufacturing Connecticut was to find her success. Accordingly, they give full weight to every beginning of manufacture that is reported from a town; every grist mill, tannery, and carding machine is reported as a "factory" or "manufactory." They mention every cotton and woolen mill and every small manufacturing venture that can be given the name, and they are careful to mention it whenever they know that any given product is "sent abroad for a market." They do not often give us figures for the output or the size of the plant. When they do it is for the ones they tell us are "on an extensive scale," and from their conception of extensiveness we can sometimes guess how small are the others. While some details may be left out, we may be tolerably certain that there was no considerable development of any industry in a town which was overlooked.

At that time, 1815-1818, there was no place in Connecticut that we today should call a manufacturing town. Agriculture was still the staple occupation of the state. Almost as universally as on the manors of medieval England the people in the New England rural communities of those days "made all they needed and needed all they made," and we cannot suppose that the conditions in the "cities" were very different. There were five cities in the state, all having been incorporated in 1784 on the basis, it would seem, of their commerce, which was in all of them important at that time. These were New Haven, New London, Hartford, Norwich, and Middletown.

One proof of the practical uniformity of conditions is found in the state constitution that was adopted in 1818. It is not necessary to go to any contemporary publication to find this document, for the constitution of 1818 is in its essentials still unchanged, and it cannot now be revised without something little short of a revolution. By that constitution representation in the House of Representatives is by towns, each having as many representatives as it had in 1818; and no town, no matter how large it may become, can ever have any more than it had at that time. Then, as now, every town had either one representative or two. In 1810 the town of Union had 752 inhabitants and New Haven 6,967. It was sufficiently preposterous in those days to give the two towns equal representation, but it is safe to say that if anyone had foreseen that a hundred years later Union would have 322 inhabitants and New Haven 133,605, the constitution would never have been adopted without some provision for amendment by direct appeal to the people.

In 1818 New Haven, though the largest city, was still a country town, and there probably was no great opposition of interests between it and the most rural towns. When President Dwight wrote his *Statistical Account* of New Haven (1811), East and West Rocks were two miles from town. The compact part of the city occupied about one out of the six square miles of the incorporated city and the eighteen of the town. He tells us⁵ there were 750 houses in the city, with "shops and barns scarcely less numerous"; "the public buildings in New Haven are the collegiate buildings, 5 churches, 4 school houses, the state house, county house, gaol, bank, alms house and market; all of them decent but none of them beautiful"; "the agriculture carried on within the limits of this city is directed to most of the objects pursued in the husbandry of this country: wheat, rye, maize, barley, oats, flax, and grass are the principal products."

Writing in 1818, Pease and Niles could say of New Haven:

"New-Haven, for a place of its size and importance, is characterized by an appearance of plainness, neatness and order; and presents little of

⁵ Dwight, *Statistical Account*, pp. 18-19.

that stately magnificence, or gorgeous splendour, which are to be found in most of the cities in the United States. The houses are in general two stories high, and built of wood, in a neat and handsome style, but are not expensive or elegant. Within some years past, however, several brick and stone buildings have been erected, which are elegant and stately edifices. Most of the buildings stand upon the streets forming the squares. . . . The buildings are not arranged in lines; many of them being set back, leaving open fronts, which are neatly fenced, and ornamented with evergreens and flowering shrubs. Almost every dwelling-house is furnished with a piece of ground in the rear, sufficiently large for a good garden; and many for a supply of fruit trees and other purposes. These advantages and improvements afford the inhabitants many conveniences in the summer season, and at the same time contribute greatly to the pleasantness and interest of the city."⁶

Yet New Haven was something more than merely a country town, for we read in Dwight's *Statistical Account* that there were 29 houses engaged in foreign trade, 41 stores of dry goods, 42 grocery stores, 4 ship chandleries, 17 butchers' stalls, and that 60 captains of vessels employed in foreign commerce lived in the town. The exports of New Haven were almost all extractive products.

Even a few years later, at the time of the *Gazetteer*, the manufactures of New Haven were almost negligible. They numbered: 1 hat factory, 1 nail factory, 1 powder mill, 1 cotton factory, 2 paper mills, 17 boot and shoe factories, and 1 comb maker. The only thing that suggests the manufacturing city of a later date is the entry "8 Chaise & wagon makers, some of which carry on the business on an extensive scale." President Dwight had written in his *Statistical Account* that ninety or a hundred carriages were made here in a year, and this surely is not an "extensive" scale of manufacture in the modern sense of the word. We must be on our guard against reading into this use of the word "factory" our modern understanding of a factory with its minute division of labor, its multitude of workers, and its power-driven machines. There was no such thing as a

⁶ In the Pease and Niles *Gazetteer* the towns are arranged alphabetically within the counties. For this reason special reference to pages in P. and N. will not be made when a statement is taken from the entry of a town whose name appears with the text quotation.

modern shoe factory until after the invention of the sewing machine, hardly before 1855, and we need not suppose that these 17 boot and shoe factories were very different from the cobblers' shops of our own day.

So much for New Haven. We have no such full account as President Dwight's *Statistical Account* of New Haven for any of the other cities of the time, but from the *Gazetteer* we can make a fairly vivid picture of conditions in the years immediately succeeding the war with England. New London's specialty was fishing. A few years later her whaling industry was surpassed only by New Bedford's, and this was in addition to her fishing "from Cape Cod to Egg Harbour" and her "coasting trade with the Southern States." Norwich, too, carried on a considerable coastwise commerce, but here there were beginnings of the cotton industry. Besides a cotton factory of 1200 spindles, she had in 1818 two paper mills, two manufactories of morocco leather, and one wool factory. Middletown and Hartford did more manufacturing. In the former were two woolen and two cotton mills "with considerable reputation." Here also were made swords, pistols, and rifles for the United States government, and it was reported that the swords "have been esteemed equal in every respect if not superior to those imported." Besides these manufactures in Middletown there were six tinware factories and small establishments for making buttons, pewter, combs, paper, powder, rope, twine, muffs and tippets. In Hartford there were still more manufactures—a looking-glass factory producing \$30,000 worth annually, one whip-lash factory making \$10,000 worth each year, one machine card factory making \$10,000 worth, one cotton factory of 320 spindles, one copper-smith employing 20 men, three distilleries, five potteries, two tinware factories, one employing 36 men, fifteen shoe factories, and one button factory, one bell foundry, one paper hanging manufactory, and one pewter factory.

These five cities represent the highest manufacturing development then found in the state. For the rest of the survey it is more intelligible to take the state by industries, to see how

much of the state was still in the stage of local self-sufficiency where each community made what manufactured goods it must have. We can thus see which communities had developed some manufactured products that they disposed of outside the town, and which were selling to a market still more remote.

It may be questioned why the years 1815-1820 are the ones chosen for the earliest survey of Connecticut manufactures. The reasons are not far to seek. There is no other contemporary account of Connecticut so full and so accurate as the Pease and Niles *Gazetteer*. Moreover there is no proof that any great changes in the economic life of Connecticut had taken place in the last forty or fifty years before 1815. It is commonly believed and frequently stated that the period of the embargo and the war with England had the effect of causing a tremendous upspringing of manufactures in the United States and particularly in New England. Effect it undoubtedly did have, particularly in the making of textiles, but the very small amount of manufacturing that can be proved to have existed at the close of the war is sufficient proof that this growth of manufactures had not been tremendous. Stoppage of trade in manufactured goods would naturally cause the beginning of manufactures within the country, but this only where a considerable proportion of the inhabitants were in the habit of depending upon foreign manufactured goods. Within a community where practically nothing but salt and a little iron were imported, where all the articles of daily use were made within the household or, at furthest, by the artisan-farmers of the neighborhood, an embargo upon foreign trade would be but little noted.

The study of Pease and Niles makes very clear to us how dependent the people of the Connecticut countryside still were upon their own exertions for manufactured goods. At that time the market for farm product was small. As we have seen, Connecticut's largest town produced all the field crops within the city limits. New York was a city of only 123,706 in 1820 and provided no such market for Connecticut's dairy products as today. Trade in Connecticut's agricultural produce there was,

and had been as long before as the time of the triangular West India trade, but there is little to prove that much of this produce came from the back country towns. Connecticut was still exporting extractive products but, in general, these came from near tide water and in return for them were imported manufactured goods from Europe. The result was that the families in the back country towns must make their own manufactured articles or go without, for they had no money with which to pay for any other kind, whereas the commercial towns on the water edge were able to import what they needed.

There were 38 towns⁷ in the state in 1818 which, so far as we know, had nothing to exchange with the outside world except their agricultural produce, and not much of that. Only one agricultural town so far as we know produced any notable crop: this was Wethersfield, on the Connecticut river. Wethersfield's onions were famous then and are still a profitable product. In this town alone among the rural towns there is no mention of a grist mill, fulling mill, or any of the other helps to farmers and their wives, and it may be that in return for their onions the Wethersfield farmers got money with which to buy flour and cloth in Hartford.

Besides these thirty-eight wholly rural towns there were as many more whose connection with the outside world was of the slightest. In Canton, for instance, there was a powder mill, in Cheshire a tinware factory, in Milford one large merchant mill; in the agricultural towns of New London, Windham, and Tolland counties we find frequently the mention of a cotton mill or a woolen mill. In the whole state there were sixty-seven cotton mills but of not more than twenty is there any suggestion that they filled any more than the local need for cotton cloth, now

⁷ Farmington, Wethersfield, Hartland, Branford, East Haven, Middlebury, North Haven, Southbury, Woodbridge, Wolcott, North Stonington, Preston, Brookfield, Greenwich, Huntington, New Fairfield, Newton, Sherman, Trumbull, Weston, Wilton, Windham, Ashford, Brooklyn, Columbia, Hampton, Lebanon, Bethlehem, Harwinton, Roxbury, Watertown, Woodbury, East Haddam, Killingsworth, Tolland, Bolton, Ellington, Union, P. and N.

beginning to take the place formerly occupied by linen. The same is true of the woolen mills, except that they seem usually to have been smaller establishments than the cotton mills. None of the ventures in this group of towns were of a kind to give employment to more than a very few of the inhabitants of the town, and they cannot be assumed to have modified in any appreciable degree the towns' essentially self-sufficing, rural character.

In all these agricultural towns, and equally in the towns where there was manufacturing, there were grist mills, fulling mills, carding machines, tanneries, and blacksmith shops, which supplied almost all the local needs that could not be met within the family group. Pease and Niles tell us that except in the cities nearly every family wove its own cloth and took it to the fulling mill for finishing.⁸ How skilful and how versatile some of the village artisans were may be seen from the following list of articles made in the blacksmith shop of James North, of New Britain, and sold to customers: augurs, brads, bridle bits, bails, chest locks, compasses, chisels, crow-bars, boxes (i. e. wagon boxes, part of the axle), bush scythes, grips, hoes, hooks, hinges, knives, keys, pitchforks, shaves, spikes, shovels and tongs, ram-rods, spades, staples, steel landslides, sleigh irons, and wedges. The list is taken from an account book of 1778-1780.⁹

We could spend a long time discussing these manufactures for consumption within the town—custom manufactures all—but we are in search of evidence of manufacture for a market, whether within the state or outside. These evidences are plentiful. In fact there are so many manufactures listed in Pease and Niles that might be so classified that it is very hard to realize how small must have been the individual establishments, how simple must have been their form of organization, and how inconsiderable the bulk of the articles named as “manufactured for export.”

In at least 45 towns of Connecticut in 1818 there was something manufactured for sale outside the town, for a market.

⁸ P. and N., p. 17.

⁹ History of New Britain, p. 264.

These manufactures fall under the two heads of manufactures that lightened home work and manufactures for profit. Both kinds were extensions of work previously done on the farms themselves or by the early artisans who had worked at their trades intermittently, for their townsmen only. All except two of the industries reported in Pease and Niles seem to have been carried on as social businesses on a small scale, the proprietor and his few apprentices and other workmen working side by side in the shop, with hand tools usually, with horse or water power occasionally. The two exceptional industries were the making of boots and shoes and the making of straw braid for hats, both of which were carried on under the domestic system, the workers doing the work at home for an employer who marketed the goods. To a certain extent the textile mills employed outside weavers,¹⁰ for 1818 was before the time of general use of the power loom, even in factories.

The statement that in 45 Connecticut towns there was real manufacturing going on must not be interpreted as saying that any of these were "manufacturing towns." A "town" in the Connecticut vocabulary is not a collection of houses side by side. A town is the unit of political division of the state, a township. Each town is bounded on all sides by other towns, never set down alone in the midst of a county as in the South. Within the town there may be villages, or boroughs, or even cities. Until a few years ago the town of Norwalk, even included two cities, Norwalk and South Norwalk, as well as a stretch of country that was merely town. Nowadays a city may be co-extensive with its town, and usually is, but when President Dwight wrote his statistical account of New Haven the city, as we have seen, comprised but six square miles out of the eighteen in the town of New Haven, and of those six miles but one square mile was thickly settled. When we say, therefore, that a town manufactured any article, we must remember that even in the largest towns the industry affected only a small proportion of the people. We shall see in what parts, if anywhere, there were real "manufacturing villages."

¹⁰ P. and N. Account of Groton.

CHAPTER II

MANUFACTURES IN 1818

MANUFACTURES THAT LIGHTENED HOME WORK

Textiles

By 1818 there were 67 cotton mills and 66 woolen mills in Connecticut.¹¹ After the invention of power machinery for textiles it was not long before cloth making began to be taken out of the home, even in the back country. We have Pease and Niles as authority for the statement that in 1818 most of the families outside of the cities wove most of their own cloth; but the cotton and woolen mills all over the state are evidence that this was beginning to change, at least to the extent that the spinning was often done outside. Perhaps these were mills which made the best cloth. There is no evidence in Pease and Niles that any of them sent their cloth out of town or made it except for customers.

Besides these small mills, however, there were larger establishments making cloth of fine quality, mills that during the war had provided a substitute for the cloth formerly brought from England. The first and largest was the mill at Humphreysville, in what was then the town of Derby, now Seymour. It was incorporated in 1810 as "The Humphreysville Manufacturing Company";¹² the incorporators being David Humphrey, Oliver Wolcott, and Thomas Vose. General David Humphrey was a graduate of Yale College in 1771; he served in the revolutionary war and afterwards became minister to the court of Portugal, and later to the court of Spain. He returned to this country in 1802 and enthusiastically introduced into New England the breed of merino sheep, thus greatly improving the quality of the wool that could be produced. The woolen mill was established in 1803 and, as we have seen, incorporated in 1810. General Humphrey was a philanthropist and was much afraid that the textile mills of America might have as dire effects upon the

¹¹ P. and N., pp. 16, 17.

¹² Conn. Statutes, May session, 1810.

children employed in them as had been revealed in the disclosures concerning the English cotton mills. He therefore built cottages for his workmen and tried in every way to make Humphreysville a model village. He inserted in the act of incorporation the following provision:

"It shall be the duty of the president and directors of said corporation to provide an instructor, for at least three months in each year, for the purpose of teaching the children employed in the manufactory, to read and write, and also the first four rules of arithmetic, and in religion, morals, and manners, as is by law directed to be taught in other schools."

Three years later the Assembly, possibly at the instance of General Humphrey, passed a law extending the contents of this provision to all present and future manufacturing establishments in the state and appointing the civil authority and selectmen of towns within which factories or manufacturing establishments existed, or a committee appointed by them, a board of visitors to see that the law was carried out.¹³ Pease and Niles say of the Humphreysville mill:

"The woolen manufactures of Humphreysville are known throughout the United States, and have acquired a reputation, at least equal to that of any other in this country. There is also a Cotton Factory at this village, belonging to this incorporated manufacturing company; a Paper Mill, and a Grain Mill. At some periods, the company have had in their employ, at the Woolen, Cotton, and other manufacturing interests at this village, nearly 200 workmen."

We must admit, then, that here at least was a manufacturing village in 1818, but we must admit, too, that it was rather artificial.

Another large mill was in Wolcottville in the town of Torrington, the property of Oliver Wolcott, one of the incorporators of the Humphreysville company, and in 1818 the governor of the state. Here, we are told, were employed forty hands. They made 25 to 35 yards of broadcloth daily, at \$6 a yard. "The cloths are scarcely inferior to the highest finished English cloths." At Goshen were two woolen mills employing each 15 or 20 persons: "The fabrics have considerable local celebrity."

¹³ Connecticut Statutes, May session, 1813.

At Danbury, too, where there were already 28 hat factories, and thus many men who were earning wages, there were two woolen mills "on a large scale."

The home of the textile industry in Connecticut, however, was in the eastern half of the state, up and down the Quinebaug and Shetucket rivers and, below their junction, on the Thames. Here it was really an "industry," a part of the same textile industry that was becoming important in Rhode Island at the same time. Here, if anywhere in the state, cloth was made for export, but how much of it was exported from the town in which it was made we do not know. The following table gives an idea of the situation of the textile industry in eastern Connecticut in 1818-1820. The statistics of the mills are from Pease and Niles. The statistics of population and operatives are from the census of 1820, which is unreliable:¹⁴

Town	Mills	Population	Engaged in M'f'ure
Killingly	4 cotton, 5000 spindles	2803	187
	1 wool		
Plainfield	4 cotton	2097	134
	2 wool		
Pomfret	1 extensive cotton	2042	125
	1 small wool		
Sterling	3 cotton, 1 extensive	1200	84
Thompson	3 cotton, 5000 spindles	2928	281
Norwich	1 cotton, 1200 spindles	3634	353
	wool, paper, distillery, leather		
Griswold	3 cotton	1869	144
Mansfield	2 cotton	2993	166
	2 wool		
Glastonbury	1 cotton, large	3114	185
	1 wool, cloth as good as any in U. S.		
Vernon	1 woolen	966	54
	2 cotton		

¹⁴ Federal Census, p. 259. "The industrial census of 1820, although conducted on a schedule which contained the principal questions of present inquiry, was even more unsatisfactory than that of 1810." "The digest prepared in the office of the Secretary of State was so imperfect an exhibit that the Secretary was only constrained to permit its publication by the imperative nature of the resolution of Congress calling for it."

Iron

In the northwest corner of the state, in Litchfield County, was a development of the iron industry which at the time of which we are treating was taking over some of the work of the local blacksmiths. Out of the 48 forges in the state, 39 were in Litchfield County.¹⁵ The mines were in Kent and Salisbury. Fortunately for the development of the mines, the Litchfield hills were well covered with wood. The center of this area of iron industry was Salisbury. Here there were three forges and two blast furnaces, one anchor and screw manufactory, one scythe manufactory, three shops with hammers operated by water power for the manufacture of gun barrels, sleigh shoes, hoes, and so forth.

In Kent besides the mines there were seven forges, manufacturing 100 tons annually. "These mines, and the manufactures and various interests which depend upon them, afford employment to industry, a stimulus to enterprise, and are sources of considerable wealth to the town," writes the correspondent from Kent. Salisbury iron was carried into the town of Canaan, which had eight forges, seven anchor shops, and two furnaces. Canaan had another industry as well, several limekilns from which a large quantity of lime was sent away for a market.

In Barkhamstead was a furnace for casting cart and wagon boxes, clock bells, and some other small articles. In Litchfield, four forges, a slitting mill, and a nail factory were at work. In Norfolk were two forges manufacturing bar iron, anchors, mill irons, cart and wagon tires, sleigh shoes, and so forth. In Washington were two forges, one slitting mill, one nail factory, and two trip hammers.

Of these iron manufactures the greater part were such as would be used on any farm, cart and wagon tires, sleigh shoes, nails, scythes, and hoes. How many of these were sent outside the county we do not know. Certain of the products would have been of no use there, such as the anchors made in the anchor shops of Salisbury, Canaan, and Norfolk, and must have been

¹⁵ P. and N., p. 15.

carted down to tide water. The clock bells of Barkhamstead were probably taken to Plymouth or Winchester, where there were clock shops. The gun barrels of Salisbury's three water-power shops could not have been made into guns nearer than the Whitney gun factory in Hamden, on the outskirts of New Haven.

There was some manufacture of iron outside of Litchfield County, as in Chatham on the Connecticut River, where there were six small furnaces for casting bells and cart and wagon boxes. Bells, mentioned also in Litchfield County, are now one of Connecticut's hardware specialities, and most of them are still made in Chatham. In Stafford, in Tolland County, there was a more important iron business, consisting of two furnaces for making castings and hollow ware. "Hollow ware" was iron cooking utensils, such as pots and kettles. The castings were cannon, cannon balls and shot, and "small articles." The output of the two furnaces was about 200 tons annually, and we are told that hollow ware cost \$60 a ton in 1810 and solid castings 5 cents a pound. The iron used in these furnaces came from Stafford itself and was of the kind known as bog iron, particularly ductile and easily worked.

Milling

Along the southern coast of the state, west of New Haven, was another extension on a profitable scale of a widespread local industry. This was flour milling. In Stratford, the town of which Bridgeport was then a part, there were three merchants' mills for flouring wheat, grinding Indian corn and "plaster paris." In Norwalk were five grain mills, of which two were merchants' flouring mills. In Fairfield nine grain mills imported the raw material and exported the product. In Stamford there were two mills manufacturing for export exclusively, besides seven others. Hardly an item in the Pease and Niles *Gazetteer* shows more strikingly the change which has come over Connecticut in the last hundred years, than this report of Connecticut as a flour-exporting state.

MANUFACTURES PRIMARILY FOR PROFIT

Distilling

As far back as colonial days, distilling was one of Connecticut's most profitable undertakings. Then, however, West India molasses was made into rum. In 1818 there were in the state, according to Pease and Niles, 178 distilleries, of which 10 are stated to have been gin distilleries. Of the others, 68 are known to have been cider distilleries and probably many of the other hundred were the same. The distilleries were located in all parts of the state, being almost as well distributed as the grist mills and fulling mills, but the principal seat of the industry was in Hartford County. The compilers of the *Gazetteer* say that spirituous liquors distilled from domestic materials were the most important export of the state and were sent to New York, Boston, Providence, the South, and foreign countries.¹⁶

The towns which most actively pursued this industry were Enfield, East Windsor, and Windsor, on both sides of the Connecticut above Hartford. According to Pease and Niles, "these towns have engaged so extensively in the manufacture and taken the lead of all others, it is not improbable that some one of them may ultimately become the Scheidam of America." They add in a footnote that Scheidam is a town in Holland famous for its gin. They rather question the propriety of making gin,¹⁷ since "of the general policy and influence of this manufacture, in a pecuniary, moral, and social point of view, very different opinions prevail." But they quiet uneasy consciences by observing that "with regard to the use of ardent spirits, it is by no means an established theorem, that its local manufacture increases its local consumption." They add, too, that the industry creates a market for grain and wood and that a thousand head of bees and also swine are fattened at the distilleries of Hartford County.¹⁸

East Windsor took the lead among the three towns that made

¹⁶ P. and N., p. 13.

¹⁷ P. and N., p. 37.

¹⁸ P. and N., pp. 14, 15.

gin so extensively. Here were six gin distilleries, four being extensive. The town made more spirits, especially at Warehouse Point, than any other town in the country, and paid \$23,913 duties in 1816. In this town, besides the distilleries, there was also one "segar" factory on an extensive scale, the sole representative in the state at that time of what is now an important industry.

In Enfield were five more gin distilleries, three of them extensive. This town boasted a second interest, the making of ploughs. Of these, besides enough to satisfy the home and neighboring town demand, there were made \$20,000 worth annually which were sent to the Southern states. Pease and Niles say that these are the most exported of the state's wooden manufactures—an indirect evidence of the quality of ploughing that our ancestors must have done.

Hats

Another industry that dated from colonial times was hat making. As long ago as 1731 the London hatters had petitioned that the colonists be forbidden to export these articles. Hatting, as a business, began in Danbury as early as 1780, and by 1818, the town contained 28 of the state's 41 hat shops. The product was a rough hat of felted fur, still made almost entirely by hand. In a book entitled "One Hundred Years of Progress," published in 1871, we read:

"Within our own recollection, the hatter in almost every village made the hats he sold, felting his own materials and forming the bodies over his blocks, and covering with them the stiff and clumsy cylinders of pasteboard, shaped, as near as might be, to the prevailing forms of the day."¹⁹

Except that the hatters of Danbury made their hats to sell in the New York market, we cannot suppose that their methods were very different from those here described. The coming in of improved machinery is suggested by the report that in Lyme were two hat factories which had bowing machines. In East Hartford was a hat factory "where the principal part of the

¹⁹One Hundred Years of Progress, p. 348.

labour" was "performed by machinery moved by water—for which the proprietors" had "a patent right."

Having disposed of these early industries of Connecticut, of which only the making of textiles and the making of hats are important in the twentieth century, we come next to those industries which are now characteristic of the state, the manufactures which are more valuable for the work done on them than for the raw materials that go into them—hardware and clocks, "Yankee notions," and plated ware and brass—all of them, as it happens, confined almost entirely to the west center of the state.

Metal Wares

The first of these, historically, was tinware. In 1740 a tinner from Ireland, named Patterson, came to Berlin and built up a considerable business in making kitchen tinware, a trade which he taught to his sons and some other young men of Berlin.²⁰ For the vending of these wares there grew up the class of men who made Connecticut known all over the country, the Yankee peddlers. From the highly developed business sense of these men Connecticut got the unsavory reputation under which she labored for many years, and perhaps has not even yet outgrown.

Even before the Revolution the young men of Berlin and neighboring towns started out with packs on their backs to peddle their tin pans and kettles up and down the roads of Connecticut. After the Revolution their operations extended further and reached the distant parts of New York and the Southern States. Gradually they added to their packs "Yankee notions," such as buttons and combs, and clocks, carrying them in horse-drawn wagons. From Berlin the making of tinware spread to the other towns of the state, especially Meriden, Southington, Simsbury, and others in Hartford and New Haven counties, as Wallingford, Cheshire, Bristol, and Hartford. The shops were usually small but some of the owners had "invested extensively."

The clock making business of Connecticut is said to have

²⁰ Timothy Dwight, *Travels*. Vol. II, pp. 53-55.

begun at Bristol under Gideon Roberts as far back as 1774. The clocks of those days were the tall ones with wooden wheels, familiar to all of us. In the first forty years of the nineteenth century changes in the construction of clocks revolutionized the industry. The names Eli Terry, Seth Thomas, and Chauncey Jerome stand out from among the names of the ordinary village clockmakers by reason of their successive inventions:²¹ the wall clock, the shelf clock, the "Pillar scroll top case," and finally the clock with rolled brass works, one of the early triumphs of the principle of "interchangeable parts." Though this did not come until a little before 1840, the inventor, Chauncey Jerome, was already in 1818 making clocks by hand in Plymouth and carrying them on his own back to the towns fifteen or twenty miles away to sell. There were in Bristol at this time several shops making wooden clocks and one making brass clocks (not rolled brass) at the rate of 2,000 a year, almost all of which were exported to the Southern and Western states, presumably in peddlers' packs. Besides these, the *Gazetteer* reports two clock factories in Waterbury and one each in Winchester and Stafford.

An outgrowth of the tinware industry, perhaps, was the making of silver plate in Berlin and also in Bridgeport. Prophetic of the britannia ware of later days were the factories for making block tin or "hard-metal" spoons, of which there were two each in Meriden and Wallingford. In the report from Meriden, which also made for export tinware, buttons, and combs, we read:

"It has been estimated that there are from 20 to 40 persons that are constantly employed in vending the wares that are manufactured in this town. Most of them are employed in the southern and western states, which afford an extensive market for the products of our industry. And this market will not be likely soon to fail; for wherever slavery prevails, mechanical ingenuity and industry will be excluded."

Of the articles comprised under the head of "Yankee notions," buttons and combs were the most important. Combs were made in New Haven, Bridgeport, Litchfield, Middletown, and Mansfield; these were of horn. Combs of vegetable ivory

²¹ One Hundred Years of Progress, p. 369.

were made in Saybrook and in Meriden. This same factory in Saybrook made a large quantity of ivory button moulds. Buttons were made in the same towns that we have found making tinware and clocks, and in one or two others besides: Hartford, Berlin, Bristol, Southington, Salisbury, Middletown, and especially in Meriden, Wallingford, and Waterbury. In Meriden there were three, and in Waterbury two, factories making metal buttons, and these are the first signs of the modern rolled brass industry of Connecticut. It was in response to this demand for rolled brass in button making that the brass rolling mills of the Naugatuck valley were started. There were two brass foundries, for the making of cast brass, one in Berlin and one in Derby.

Small iron hardware was at this time exported from the state in very small quantity, if at all. As we have seen there was a screw factory in Salisbury; and other small articles, not named individually, were cast in various places. Steelyards, augurs, and screws were made in Mansfield, and there were five wire factories in Granby and Simsbury. The absence of reports of hardware factories is indirect evidence that the blacksmiths were still making articles of this kind for their individual customers.

Other Manufactures

The machinery made in the state was all for use in textiles. In Hartford was a machine card factory doing a business of \$10,000 a year, and in Coventry was another manufactory of carding machines. In New Hartford, in Litchfield County, was an "extensive" manufactory for making carding, shearing, and spinning machinery.

On the other hand, the making of munitions of war was well developed for the time. There were eight or ten powder mills in East Hartford, cannon and shot were cast in Stafford, gun barrels were cast in Salisbury and were welded in Haddam. In Berlin there were two pistol factories, and in Middletown were a powder mill, a pistol factory, a rifle factory, and a sword factory. These were sold chiefly to the United States govern-

ment. Perhaps the most important firearm enterprise in the state, however, was the Whitney gun factory in the town of Hamden, just beyond the New Haven town line.

When Eli Whitney's invention of the cotton gin was disputed and the resulting litigation deprived him of any hope of obtaining money from that invention, he turned to the making of guns for the United States government. He secured a contract for 2000 and then found himself unable to get workmen of sufficient skill to make the locks of the guns. He overcame this difficulty by putting to practical use the principle of "interchangeable parts." Here in his gun factory he split lockmaking into many different acts, each one so simple that an unskilled workman was all that was needed. His workmen made each one simple part of a lock and Whitney was able to secure such uniformity in the parts thus made that all that was necessary for a perfect lock was to assemble the parts when they left the workmen's hands.

The other manufacturing industries of Connecticut at this time do not require extended mention. New Haven, as we have seen, made a few carriages for export, as did also the town of Burlington in Hartford County. Leather goods, a considerable portion of which were sent abroad, were made in Hartford, Bridgeport, and many towns in Fairfield County. Glass bottles were made in East Hartford and Coventry.

The two industries that were then carried on under the domestic system were shoemaking and the making of straw braid bonnets. The three towns of Guilford, Durham, and New Canaan made shoes "extensively." Sixty thousand pairs were exported annually from New Canaan, and even more were made in Guilford. Durham exported a considerable quantity to the Southern States. The manufacture of straw braid and bonnets was mentioned only in the town of Stafford. The comment of the Stafford correspondent is interesting as showing the contemporary attitude toward "woman in industry":

"Large quantities of straw braid and bonnets are made and sent abroad for a market, which is equally important, regarded as a source of

profit, or as a means of promoting female industry and habits of attention to business, and a consequent abstraction from light and frivolous occupations and amusements, or the more unwarrantable employment of local detraction."

These, then, were the manufactures of Connecticut in 1818. What did they all amount to? We have no figures in Pease and Niles as to the aggregate value of manufactures, and the figures of the census of 1820 are known to be inaccurate. If we could believe them we should say that the manufactures of Connecticut amounted in 1820 to \$2,067,000. It must be remembered, however, that in those days many things were classed as "manufactures" which would not now be so classed.

We know in what towns manufacturing had begun. These were the textile towns of the east, the towns of Litchfield County where iron was made, the towns along the coast where there was a small amount of flour milling carried on, Danbury with its hats, and the towns of the center of the state where industry was diversified: Hartford, Middletown, Berlin, Meriden, Wallingford, New Haven, Bridgeport, Bristol, Plymouth, Waterbury, and Derby. Between Waterbury and Derby the Naugatuck Valley, now almost completely given over to the brass and rubber industries, was purely rural. Bridgeport was growing rapidly but it has not entered our summary as pre-eminent in anything, nor was New Haven. Within these towns there were doubtless a number of small villages where a considerable proportion of the people were employed more or less continuously at manufacturing for a market, but we cannot assert that in any *town* enough people were employed in manufactures to permit us to call it a manufacturing town.

CHAPTER III

MANUFACTURING PROSPECTS

We have seen how far manufacturing had progressed in 1818. The next question is, what were the prospects for its further development? We can answer without hesitation that Connecticut had almost all the necessary factors of manufacturing growth. The state is roughly a rectangle ninety miles long and fifty-five miles wide, and has an area of slightly less than five thousand square miles. It is divided into three well defined parts: the valley of the Connecticut in the center, with an upland region on each side. Each of these uplands is drained by two rivers which unite about ten miles before they reach Long Island Sound. In the eastern upland the Quinebaug and the Shetucket come together at Norwich and make the Thames, which reaches the Sound at New London. In the west, the Naugatuck and the Housatonic come together at Derby and flow into the Sound at Stratford.

In the rocks which cover her fields and in her plentiful lakes, Connecticut still carries the marks of the glacier which once covered her. Except in the Connecticut valley the land is rocky and not very fertile. There are only two good harbors, New London and New Haven, but the Thames is navigable to Norwich and the Connecticut to Hartford.

The state had the natural advantage of excellent water-power. The Connecticut, running down a level valley, offered, it is true, no waterfalls and was too wide within this state for a dam. The rivers of the uplands, however, were smaller and had a steep drop to the sea, a drop of about 600 feet in the valley of the Housatonic. Behind these rivers were inexhaustible reservoirs in the wooded hills and the many lakes; Connecticut rivers will run mills all the year round.

Connecticut had, likewise, good transportation facilities for those days. Her big central river was navigable two-thirds of the distance to the Massachusetts line and made an outlet for the center of the state. The rivers of the east and west were navig-

able for ten or fifteen miles, and all along the southern shore were harbors that are not now considered very good, but they were good enough for the boats of those days. There were turnpike roads to all the larger towns of the state; six of these centered in New Haven. After 1816 steamers went regularly twice a week between New York and New London and New Haven.

Such market as there was Connecticut could easily reach. New York was already a distributing point, and Southern planters came to it to get their plantation supplies. The South did not yet, it is true, present a very large market, but as we know now, it was one that grew, and even in 1818 it was the destination of many of Connecticut's exports.

Connecticut's supreme resource for manufacturing development was in the character of her population. Since colonial days she had shown a surplus population and had been sending emigrants all over the country.²² They went to Dutchess and Columbia counties in New York, which lie just west of the western Connecticut counties, to the Wyoming Valley in northeast Pennsylvania, to Vermont, where the towns repeat thirty-five of the names of Connecticut towns, and finally to western New York and the Connecticut Western Reserve in Ohio. Pease and Niles estimate that the Connecticut emigrants with their descendants number 700,000 people, and though we cannot admit this figure it is clear that the emigration had been very large. In spite of emigration, however, Connecticut had maintained her population, though her gain for the last three decades had been slight. From 1790 to 1800 she had gained 5.5%, from 1800 to 1810 4.4%, and from 1810 to 1820 5%. In 1820 she had a population whose density of about 57 per square mile was exceeded only by that of Rhode Island. This constant emigration, coupled with the maintenance but not expansion of population at home, is evidence that Connecticut had reached the limit of her power to support by agriculture, under the agricultural conditions of that time, a larger number of people than she already had. Her

²² P. and N., p. 11.

population in 1820 was 275,248; and any considerable increase of population in the future must be based on a change in the occupation of her inhabitants.

The people who were living in Connecticut in 1820 were eminently well fitted for manufacturing. They were ingenious and well educated, and had always, even while living in their isolated town groups, maintained a fairly high standard of living. Every farmer was a skilled mechanic as well. In the villages the blacksmiths, as we have seen, were deterred by none of the difficulties of making ordinary hardware. The result of all the household manufacture that was carried on was a huge fund of mechanical skill and aptitude ready and anxious to turn to any pursuit which would make it easier to earn a living.

On the other hand the state was poorly supplied with raw material. Neither her distilleries nor her flour mills could expand very much on the amount of grain Connecticut farms would produce; the iron mines of Litchfield County were as good as any in New England, but they were not good enough to compete with the mines soon to be opened in New Jersey. Copper and all other metals are found in the state but in quantities too small to pay for the working. Cotton, of course, had to be imported. We cannot say the same of wool, but to this day Connecticut farmers would rather raise dogs than sheep, and though for a number of years sheep raising was carried on extensively, little came of the promise given in 1818 that the state would raise a large quantity of fine merino wool. This lack must not be overestimated, however, for an ingenious people with transportation facilities is never daunted by want of raw material. Another obstacle to the development of manufactures was the lack of capital. The description of New Haven, quoted on page 6, shows us that even in the largest city of the state there was but little accumulated capital.

We must next see what changes took place in the state in the next twenty-seven years. We choose this interval because in 1845 the state government took a census of the various branches of industry carried on within the state, and again we have an

account, town by town. The full title of the report is, "Statistics of the Condition and Products of certain Branches of Industry in Connecticut, for the year ending October 1, 1845." It is referred to briefly as "Connecticut Statistics, 1845." The figures on which the report is based were compiled from the returns of the town assessors by Daniel P. Tyler, Secretary of State, and we may fairly trust them for accuracy. The book was compiled hurriedly, however, which accounts for one or two easily discovered inaccuracies. On the whole, computations based on study of the towns give exactly the same figures as the condensed tables in the back of the book.

In the twenty-seven years with which we are now dealing Connecticut made some important advances in transportation facilities. In 1824 and 1825 steamers from New York began making daily trips to New Haven, Bridgeport, Norwalk, and Stamford. It is said that competition was so brisk that the fare between Norwalk and New York was reduced to 12½ cents.²³

The Farmington Canal was opened in 1828 from New Haven to Cheshire and Farmington.²⁴ In 1829 it was extended north to Westfield, Massachusetts, and in 1835 it reached the Connecticut River at Northampton. The canal was opened with high hopes that it would do as much for the state as the Erie Canal had done for New York, but it was never very profitable. It was abandoned in 1847 and its bed was used for the route of the "Canal Railroad" from New Haven to Northampton.

Traffic east and west being well served by the steamboats on the Sound, it was natural that the early railroads of Connecticut should run north and south and connect with the Western Railroad, now the Boston and Albany, the line which carried New England products to the Erie Canal and the West.

The first stretch of railroad in the state was opened in 1837 and was the western part of the New York, Providence, and Boston Railroad.²⁵ It went through Connecticut only from the

²³ Connecticut as a Colony and a State. Vol. 3, p. 285.

²⁴ Barber, History and Antiquities of New Haven, p. 48.

²⁵ Connecticut as a Colony and a State. Vol. 3, p. 290.

state line to Stonington, and the connection with New York was made by steamboat. The first north and south road was opened from New Haven to Meriden in 1838 and from Meriden to Hartford the next year; it was extended to Springfield and the Western Railroad in 1844. The line from Worcester to Norwich and New London was opened in 1839 and 1840, and between 1840 and 1842 the Housatonic Road was opened from Bridgeport to Sheffield, Massachusetts. There were therefore by 1845 three railway lines crossing the whole width of Connecticut, giving it easy access to the West by way of the Western Railroad.

Connecticut's rate of growth of population will be better realized if it is compared with the rates of Massachusetts and Rhode Island in the same years:

	Mass.	R. I.	Conn.
1820-1830	16.6%	17.0%	8.1%
1830-1840	20.8%	11.9%	4.1%
1840-1850	34.9%	35.6%	19.6%

Clearly, Connecticut was not growing nearly so fast as her neighbors. Her population in 1840 was 309,792, as compared with 275,248 in 1820.

CHAPTER IV

MANUFACTURES IN 1845²⁶*Textiles*

There were by this time 136 cotton mills in the state, as compared with 67 in 1818, and 119 woolen mills as against 66. The eastern side of the state was still the textile side, but cotton and woolen mills were scattered through the western half of the state quite as much as before. From the numbers of persons employed in these mills we infer that weaving had almost completely left the homes. There were 1854 persons employed in cotton and woolen mills outside of New London, Tolland, and Windham counties and 5656 within them. The following were the principal textile towns, 1845:

Town	Mills	Spindles	No. Employed
Killingly	16 cotton	23,310	650
Plainfield	7 cotton	11,012	312
	4 wool		100
Norwich	7 cotton	17,332	633
	3 wool		228
Sterling	4 cotton	5,578	173
Thompson	9 cotton	21,698	445
Criswold	9 cotton	13,700	310
Glastonbury	2 cotton	5,690	190
Vernon	10 wool		278

Within the textile industry there was now far more diversification than in 1818. The cotton cloths are listed as drills, shirtings, prints, gingham; the woolen cloths as broadcloth, cassimere, Kentucky Jeans, flannel, blanketing, and tweeds. A particularly popular weave was satinnet, a mixture of cotton and wool.

The manufacture of cotton thread was well started by 1845. In Windham, where in 1818 there were no manufactures listed, the village of Willimantic had come up and now made annually 45,000 dozen spools of thread besides 50,000 yards of shirtings.

²⁶ Connecticut Statistics, 1845. The entries in this book are arranged alphabetically by towns within the counties, and can easily be verified. The tables in this chapter have been made up from town entries. Further references to this will not be made in these notes.

In Willington's one cotton mill 24,000 dozen spools of thread were made by 19 employees. Killingly, Plainfield, and Pomfret also made thread.

In Norwich two establishments bleached and colored 3,900,000 yards of cloth. In Hartland, one of the very rural towns of 1818, there was an establishment which printed 2,000,000 yards of calico a year and employed 46 persons.

There were six carpet factories operating on a large scale as follows:

	No. Factories	Output	Employees
Thompsonville	2	350,000 yards	500
(Town of Enfield)			
Simsbury	1	234,000 yards	329
Norwich	3	107,000 yards	83

In Enfield, too, there was a factory making 300,000 pairs of stockinet shirts and drawers in a year, and employing 100 workers, probably many of them at home.

In 1818 sewing silk was made in Mansfield only, but in 1845 it was made in Willington, Windsor, and Manchester as well. Manchester was a new town which had been cut out of the eastern part of East Hartford in 1823. The silk business there in 1845 employed 69 persons in making 13,200 pounds of sewing silk. This enterprise was conducted by the firm of Cheney Brothers, established in 1838.

In Norwich, there were more textile workers than in any other town. There were other industries as well: four paper factories, employing 182 persons, three iron foundries, and two clothing shops employing 103 persons, besides various other establishments.

Iron

In Litchfield County the iron industry was barely holding its own. In Kent the three furnaces for pig iron employed 280 and were making 3,000 tons as compared with 100 tons made in 1818, but the manufactures of iron show no such increase. In Salisbury scythes were still made and cutlery and ploughs as well, but anchors and screws are no longer men-

tioned, nor were anchors any longer made in Canaan. In Winsted, town of Winchester, the proprietors now had added to their smelting forges the manufacture of shovels, spades, and scythes, and had a machine factory employing 18 men.

Making iron ware for the farms was carried on in a small way in many towns of the state. The establishments for making ploughs and shovels, forks, and hoes seldom employed more than five persons. Scythe making was more concentrated; only ten scythe manufactories are listed and of the 93 workers in these, 80 were employed in the five establishments in Salisbury and Winchester. Axes were made in 21 towns of the state, but in only two was axe-making in any way important. In Derby the two axe factories employed 47 men. In the village of Collinsville, in the town of Canton, the Collins Company was already making axes on a large scale. Their factory employed even then 175 men and made 198,000 axes a year. This firm at the present time employs five hundred or more men and still conducts most of the business in Collinsville. One of its specialties nowadays is making machetes for the Mexicans.

In 1845 the milling industry along the sound had died out altogether. The towns where this had gone on—Stratford, Norwalk, Fairfield, and Stamford—were growing and prospering, but by this time they were making other things: boots and shoes, hats, and coaches and wagons especially, as well as some iron work. The same fate had overtaken the distilleries of Hartford County. In Enfield, the town which had formerly paid more internal revenue than any other in the country, only five men were making gin. The making of ploughs in that town employed 26 men still, but the annual value of the product had fallen from \$20,000 to \$15,000. In place of these operations, however, had come up the making of carpet and hosiery.

Hats

Danbury was still the center of the hat-making business. It had now 57 hat and cap factories instead of 28, and was employing 658 men. The development of machinery had brought in as well the subsidiary occupations of making hat bodies and

blowing and cleaning fur, which together employed more than sixty men of the town. That Danbury no longer had a complete monopoly of this industry, however, is shown by the number of men employed at hat and cap making in the following towns: Norwalk, 83; Newton, 56; Monroe, 55; Redding, 53; Ridgefield, 46; Brookfield, 22; Wilton, 25. All of these are in Fairfield County; in all, sixteen towns in this county report hat making.

None of these industries, with the exception of hat making, had shown in any great growth between 1818 and 1845. The textiles had grown but not to any such extent as the same industry in Rhode Island and Massachusetts. The other industries had positively declined.

Light Metal Wares

It was in the making of her light metal wares that Connecticut had made real progress since 1818, and more and more the towns in the center of the state, in the district bounded roughly by lines drawn from Hartford to New Haven, to Bridgeport, to Waterbury, to Hartford, were absorbing the state's manufacturing growth. In all these towns—Hartford, East Hartford, Middletown, Berlin, Meriden, Wallingford, New Haven, Bridgeport, Derby, Naugatuck, Waterbury, Plymouth, Bristol, and Southington—industry was diversified, but there were specialties even in these.

The number of things manufactured in any one of these towns is so great that it is bewildering to take them town by town and repeat what was made in each. Somewhat greater orderliness is secured by going over the different industries and pointing out where they were carried on most extensively.

In fifty towns tinware was made, and there were 101 tinware factories listed. Many of them employed only one man and many more but three or four. In only a few towns was it a business large enough to make a product for export or for sale in any but the local market. The towns where tinware making was of any importance were as follows:

	No. Factories	Value Annual Output	Employees
Meriden	9	\$112,500	96
Hartford	5	50,000	38
New Haven	8	37,000	35
Bridgeport	3	28,000	14
Enfield	3	39,000	16
Berlin	3	16,000	18

The one clock factory in New Haven, probably the largest single clock factory at that time, was the property of Chauncey Jerome, where he was making large numbers of inexpensive clocks with rolled brass works. The following table explains the status of clock making:

	No. Fact.	No. Clocks Manufactured (no return)	Value Annual Output	Employees
Bristol	15	(no return)	\$325,000	250
Plymouth	5	95,500	191,000	200
New Haven.....	1	41,000	105,000	90
Eurlington	2	36,000	72,000	30
Winchester	1	12,000	30,000	30
Southington	2		16,000	22
Farmington	4	9,500	19,000	18

Plated silver ware was made as follows:

	No. Factories	Value Annual Output	Employees
Granby	1	\$100,000	60
Hartford	4	44,500	45
New Haven.....	4	35,000	43
Bridgeport	4	10,000	13

In Wallingford German silver and white metal spoons were made to some extent, and more Britannia ware was made in Meriden and Wallingford than in any other towns; Meriden's eight shops employed 37 people and did an annual business of \$49,000, and Wallingford's three employed 24, with an annual value of product of \$30,000. Other towns which made this ware were Middletown, Hartford, New Haven, East Haddam, Rocky Hill, Cheshire, and Prospect.

*Brass*²⁷

In 1818 buttons had been almost the only manufacture in

²⁷ Lathrop, *The Brass Industry in Connecticut*, passim.

which brass was used in Connecticut, so far as we are told in Pease and Niles, though from the local histories we learn that a few small articles were then being cast from brass. By 1845 the two brass foundries of 1818 had been increased to forty-eight, of which six were in Waterbury and employed 297 persons, and 14 were in Berlin and employed 197. The report "Connecticut Statistics" fails utterly to make the vital distinctions between brass foundries and brass rolling mills. Brass foundries make brass for castings, and brass rolling mills make sheet brass and wire. It is in this latter manufacture of brass that Connecticut is preëminent. The sheet brass and wire are remanufactured into buttons, pins, hooks and eyes, and many other things. The making of rolled brass began in response to the need for this in making brass buttons. Outside the Connecticut market, the demand for brass of this kind in the whole United States barely exceeded 150 or 200 tons a year. This demand the Waterbury pioneers in the button-making industry determined to fill. By the time they had succeeded in making a good brass, they had facilities for making more than the existing market could use. Accordingly, they were driven to re-manufacturing their own product. Soon new uses for it developed, the first being in clock works; and ever since, as fast as the brass makers of the Naugatuck Valley have become able to meet or exceed the demand for brass, new uses have come up to absorb the product.

In 1845 there were forty-two button factories in the state, some making buttons of brass and some making them of bone or wood. Of these, fifteen were in Waterbury, ten for making metal buttons and five for making "flexible" buttons, of what material it is not stated. The annual output of these button factories was about 330,000 gross, at a value of \$291,000, and 380 persons of the town were employed at this industry. Just below Waterbury, on the Naugatuck River, was the new town of Naugatuck; here there were eight button factories, four making metal buttons.

A pin factory in Waterbury made 200,000 packs a year and

employed 80 persons, and another in Derby made 150,000 pounds of pins a year and employed 70 persons. Both of these factories were using the newly invented machine for sticking pins in papers. A brass-wire manufacture unknown in 1818 was the making of hooks and eyes. One factory in Derby made 70,000,000 hooks and eyes a year, valued at \$44,000, and employed 60 persons. In Berlin there were 136 persons making hooks and eyes. In these and other towns various articles of brass were being made in small quantities: combs, buckles, eyelet rings, umbrella and clock trimmings, mouse and rat traps, snaps, and kettles.

Hardware

The extent to which hardware making was carried on in 1845 will be best shown by the following table giving the numbers employed in making the different articles in the towns where the industry was most important:

CUTLERY		BUTTS AND HINGES	
Meriden	50	Waterbury	25
Wethersfield	45	Middletown	15
Waterbury	35	New Haven	6
Bristol	26	LOCKS	
LATCHES AND DOOR HAN-		Plymouth	38
DLES, KNOBS		Berlin	34
New Haven	115	Middletown	17
Meriden	30	Torrington	10
Berlin	10	SCREWS	
TACKS AND BRADS		Chester	52
Derby	28	Hartford	35
FIREARMS		MACHINERY	
Hamden	30	Hartford	45
Norwich	55	Windham	69
Middletown	75	Killingly	26
		Bristol	25

Other iron manufactures in the towns of the central counties were saws and rivets in Farmington; wagon bolts in Southington; files, carriage springs, steps, and bolts in New Haven; gimlets in Cheshire and North Haven; and rakes, skates, sickles,

window springs, steelyards, portable balance scales, and vises in Meriden.

Carriages and Wagons

The making of coaches and wagons had begun in New Haven in 1818; by 1845 it was her most important industry and it remained so until after the Civil War. In 1845 there were 24 establishments making carriages and wagons, employing 460 persons and having an output valued at \$553,000 a year. Bridgeport came next as a carriage-making town, with four shops, where 169 persons were employed and the value of the output was said to be \$153,253 a year. Twenty-six towns altogether are reported as making coaches and wagons but only these two conducted the business on any considerable scale. Saddlery and harness making were carried on chiefly in Bridgeport and Hartford.

India Rubber

In addition to these industries another had arisen, the result of a recent invention. To Charles Goodyear, born in New Haven and brought up in Naugatuck, the world owes the beginning of successful use of india rubber. After nine years of experiment with the sticky, easily decomposed material, in 1839 Goodyear discovered that he could cure the rubber perfectly by the mixture of sulphur with the rubber at a temperature of 270 degrees Fahrenheit. This process he named vulcanizing and he secured a patent on it. By this time his friends were tired of putting money into inventions which had always until now proved ineffectual, and it was not until 1843 that the first factory using the Goodyear patents was opened. This was in Naugatuck, Connecticut, and was the property of Goodyear's brother, Henry Goodyear.²⁸ In 1845 the industry had a good start in Connecticut for the real value of vulcanizing rubber quickly became apparent. At this time india rubber was used chiefly in making suspenders and rubber shoes. The latter were made in Naugatuck, New

²⁸ Peirce, *Life of Charles Goodyear*, p. 123 ff.

Haven, and Hamden, and suspenders were made in Middletown, Meriden, Waterbury, and Litchfield.

All the industries so far mentioned were now carried on under the factory system, with the help of some outside labor. Most of the factories were still small. There are instances of large establishments, as the two carpet factories at Thompsonville, where five hundred persons were employed, and the axe factory at Collinsville where there were a hundred and seventy-five. Aside from these and a few other large establishments that might be mentioned, a single establishment employing more than a hundred persons within the factory was an exception. Even where the aggregate of workers in one industry of a town was large, the individual establishment was usually small: Waterbury's 300 metal button makers averaged only 30 to a shop; New Haven's 460 carriage and wagon makers worked in 24 different shops, an average of 19 to a shop. The figures in *Connecticut Statistics* are so arranged that we cannot tell the size of the several establishments within a town where more than one factory of a kind existed, but must reduce them to an average.

Boots and Shoes

The making of boots and shoes for sale was now widespread, although none of the modern shoe-making machinery had been invented and the industry was still being carried on under the domestic system. There are people now living in Connecticut who remember when the shoemaker came to the house for a week and made up the shoes for the entire family out of leather provided by the customer. By 1845, where shoe making was a business, one man bought the material, cut it out or had it cut for him, and then gave out shoes by the case to be made up by neighboring families at their own homes. Within these families the work was apportioned according to the strength and ability of the members.

In 1818 the Connecticut towns which made most shoes were Guilford, Durham, and New Canaan. The annual output of the last of these towns was then 60,000 pairs. In 1845 the three towns were still making shoes but no more than many other

towns. Towns where boot and shoe making were important were the following:

	PAIRS MADE		Value Annual Output	Employees	
	Boots	Shoes		M.	F.
Hartford	138,467	148,615	\$382,250	498	376
New Haven.....	17,766	137,349	153,111	373	165
Norwalk	3,189	90,491	77,189	274	202
New Canaan.....	42,976	118,611			
Darien	1,960	67,325	14,130	122	215
Milford	2,135	55,224	41,706	75	100
Norwich	5,176	25,639	36,308	60	37
Bridgeport	7,515	10,015	27,513	18	85
Greenwich	2,340	25,225	31,730	67	84
Stamford	9,037	34,398	39,069	133	75
Wilton	7,966	23,095	41,628	89	26

All these towns, except Norwich and Hartford, were along the southern shore of the state, east of the Connecticut. At the same period, however, shoemaking was carried on extensively in the parts of Massachusetts bordering on Connecticut, and we find a similar development in northeastern Connecticut, though here shoemaking was not so important as in the southern part. In Ashford were made more than 55,000 pairs of shoes and the report states that this was done by contract from Massachusetts and Hartford. If we could only credit the figures given, Woodstock would easily rank first of all the towns in the state. It is reported that it produced 5,651,580 pairs of shoes, at a value of \$68,045, and employed in this work 4,918 men and 4,907 women. The compilers of the book accepted the figures unquestioningly and count them in making up the state total, but inasmuch as Woodstock had at this time a population of only 3053, and five million pairs of shoes would surely be worth more than \$68,000, we are forced to cast out the figures and merely state that Woodstock, too, made shoes.

Hats and Clothing

Straw braid for hats was still made but it had almost given way to the manufacture of palm leaf hats; these were made, so far as these figures show, entirely by women. The places where the business was important were a series of towns along the northeast border of the state, and their output was as follows:

Town	Number Made	Value	Employed
Willington	40,758	\$4,641	153
Stafford	31,183	5,357	195
Ellington	12,712	1,779	61
Ashford	10,573	1,694	9
Union	7,460	4,476	45

These figures must not be taken too literally, for it is not likely that in these five neighboring towns the quality and quantity of hats made varied, in proportion to the number of persons employed, as much as these figures would imply.

Another industry carried on under the domestic system was the making of ready-made clothing. It is usually supposed that this industry did not take form until after the invention of the sewing machine. Now this machine was not invented until 1846 nor much used until after 1850. But the volume of Connecticut statistics already cited shows that in 1845 a rather large number of women were employed at making clothing in their own homes, in both city and country. The relation between the amount paid for labor and the number employed, the figures for which are given in a few instances, shows that the women must have been employed for only a part of their time. In Huntington, for instance, 124 women were employed and the value of labor is given as \$4,636.

The following quotation from a history of Bridgeport, though not a contemporary source, will show how the business was conducted:²⁹

"The making of shirts was commenced here in 1836. D. and I. N. Judson, it is supposed, were the first parties in the county to make a special business of manufacturing shirts for trade. They had in their clothing store in New York a department devoted to shirts. At first a few of these shirts were cut and sent to their sister, Miss Caroline Judson of Old Mill Green, who gave them out to women in the vicinity who made them, laundried, and returned them ready for the salesman. The business so increased that Wyllis Stillman became the superintendent in the place of Miss Judson and the work was conducted in the mill building at the head of Pembroke Lake which was used for many years as a storehouse and laundry. The Rev. Cyrus Silliman then residing at Green's Farms, aided in placing the work in proper hands, at first in his own vicinity, and afterwards conducted a separate business in which he traveled through a considerable extent of country."

²⁹ Orcutt, History of Bridgeport, pt. 2. Pp. 706-7.

Hartford took first place in this industry, as it had in the making of shoes. In 24 shops, 98,890 garments were made, and 380 men and 618 women were employed. In New Haven 246 men and 235 women were employed. In Bridgeport there were two shirt factories employing 650 women, possibly the two enterprises described in the quotation just given.

A special development of this industry around New London was the making of sailors' clothing. This town was then at the height of its prosperity under the whaling trade. Sailors' clothing was made to the value of \$57,000, those employed numbering 103, and in other ways too the whaling industry affected the country around New London. In New London itself were made 86,887 barrels for whale oil; in Stonington oil casks were made to a capacity of 1,330,000 gallons; and in New London, again, were made 457,000 pounds of ship and pilot bread.

It would be fruitless to enumerate all the small manufactures that were carried on throughout the state at this time. In the *Illustrated Atlas of the United States and Adjacent Countries*, published in 1838, there is a short descriptive article on each state. On page 55, in the description of Connecticut, we read:

"The manufactures taken in the aggregate are of great value, but many of them are in the hands of the rural population, and there are few large establishments in the state. The Connecticut wares are well known all over the country, and are often carried from town to town to the most remote quarters by the thrifty pedlars from the same State."

A few examples will be sufficient to show the great variety of things that were made in the homes of the state or in small shops. Bobbins were made for the textile mills, and in Willington spools for cotton thread. Cheese boxes were made in several towns in Litchfield County, for already Litchfield was finding profit in dairy products. Other wooden articles made in the country towns were wagon hubs, beehives, butter kegs, clothes pins, awl helves, rules, clock cases, coffee mill boards, baskets, furniture knobs, looking glass frames and map rolls. All these were made in small quantities and were not very valuable, but they must have added appreciably to the farmers' incomes.

In most of the larger towns we find notice of a "sash, door, and blind factory," or of a "saddlery and harness factory," and shops of the makers of "mechanics' tools," evidences all of the growth of division of labor within the different communities but not evidence that can be cited to show that Connecticut had yet any claim to be called a "manufacturing state."

One striking thing about the manufactures of the state, both in important industries and in unimportant ones, is the complete absence of anything that can be classed as a luxury. Comforts there are and many necessities, but not an article was made which would not be bought and used by some plain person with but little money to spend.

SUMMARY OF PRINCIPAL CONNECTICUT MANUFACTURES, 1845

	No. Employed	Value Annual Output
TEXTILES		
cotton goods	5,362	\$3,023,326
woolen goods	2,149	3,280,575
silk	272	173,382
bleaching, coloring	302	618,000
worsted goods	42	82,000
carpets	946	597,028
hosiery and yarn	168	320,373
	9,241	\$8,094,784
DRESS (usually domestic system)		
ready made clothing	3,000 ca.	\$ 931,559
boots and shoes	6,000 ca.	1,741,920
palm leaf hats	593 ca.	113,780
hats and caps	1,461	921,806
		\$3,707,065
CARRIAGES AND WAGONS...	1,506	\$1,222,091
INDIA RUBBER		
rubber goods (domestic)	329	\$ 225,000
rubber shoes	86	115,000
	415	\$ 340,000
PAPER	659	\$1,186,302
METAL INDUSTRIES		
Hardware		
small hardware	295	\$ 387,546
hollow ware	585	476,450

tin ware	414	487,810
cutlery, edge tools	176	91,837
	<hr/>	<hr/>
	1,470	\$1,544,143
Brass		
foundries, kettle and wire		
fact.	608	\$1,126,494
button	637	428,762
pins	158	170,000
hooks and eyes	208	111,600
	<hr/>	<hr/>
	1,611	\$1,836,856
Copper.....	40	\$ 275,000
Miscellaneous Metal Ware		
Britannia ware	130	\$ 145,157
plate	209	280,210
watches, jewelry	175	206,770
(handicraft chiefly)		
	<hr/>	<hr/>
	614	\$ 632,137
Miscellaneous Iron		
rolled, or slit iron	170	\$ 442,061
forges	365	391,275
pig iron	362	272,000
agricultural implements	518	447,650
machinery	436	363,860
mechanics tools	170	442,061
steam engines and boilers	13	16,700
	<hr/>	<hr/>
	2,041	\$2,080,026
Adjusted Machines		
clocks	656	\$ 771,115
firearms	164	155,825
	<hr/>	<hr/>
	820	\$ 926,940

CHAPTER V

SIGNIFICANCE OF THE FIGURES FOR 1845

At the risk, and indeed with the certainty, of being tedious, we have given a great many details concerning the manufactures of Connecticut in the years 1818 and 1845. These have been given, not because they are in themselves interesting, or even because it is very important that one town employed 17 men at button making while another employed 29 at making cotton goods, but because only by such detailed analysis can we hope to prove what were the conditions of industry at a given time. Even with all these details it is not possible to differentiate, in every case, handicraft custom work from manufacture for a distant market, yet without such differentiation figures regarding manufactures must be inaccurate.

The result of our survey of Connecticut manufactures in 1845 must persuade us that this was not yet a manufacturing state. Obviously a change had taken place, but it is easy to overestimate this change. There was now the beginning of a wage-earning class, but a liberal estimate of the number of persons in Connecticut who were engaged in manufacturing for a market would be twenty or thirty thousand out of a population of somewhat over three hundred thousand. In spite of the bewilderingly large number of different things which were made in the state, the quantity of each thing made was still small, and the value of all the manufactures put together was not so great as that of almost any one of the manufacturing cities of the state today.

As early as 1846 the following paragraph appeared in an article in Hunt's *Merchant's Magazine*, written as a review of our source, *Connecticut Statistics*, 1845:

"We have before intimated that from the comparative bareness and the primitive rocky nature of the soil and its limited territorial extent, the enterprise of the people is in a great measure directed to the various kinds of manufactures. It will hardly be denied that peculiar advantages are afforded to those particular species of enterprise in the extent of water power which is furnished by its numerous streams and by its

healthful skies as well as by those principles of morality which cause occupation of some kind to be deemed a source of virtue as well as of respect. Accordingly, it has happened that the interest of manufactures has gradually grown up in this state so that it has now become not only one of its most prominent if not the most important enterprise, indeed the main source of its prosperity."³⁰

Nevertheless, we cannot admit that in 1845 manufactures were the most important enterprise in Connecticut or even that they were the "main source of her prosperity"—unless, indeed, we were to venture the assertion that only the manufactures were prosperous, and this we cannot do. //

Since 1784 but one of the Connecticut towns had become a city: this was Bridgeport, which became a separate town in 1822 and a city in 1836. As we have seen, Connecticut's growth in the years since 1820 had been very slow. In 1840 only 16 per cent of her people were living under urban conditions, that is, in towns of more than five thousand people. Though there was doubtless much manufacturing, even under factory conditions, in towns of less than five thousand, the people in these small towns who lived by agriculture were in most cases far more numerous than the factory workers. Sixty per cent of Connecticut's population in 1840 were living in towns of less than three thousand, towns definitely agricultural in character, and there were many more who were earning their living from agriculture carried on within the limits of the more populous towns containing manufacturing villages.

Undoubtedly, manufacturing was the interest within the state which held most promise for the future, was the most noticeable for its vigor, and thus naturally the one which historians and other writers of the time would describe. The marked decline in Connecticut agriculture had not yet set in, and the population of the rural towns was still maintaining itself. Figures on this point are hard to secure, if not impossible, but it is very probable that the growth of manufacturing villages would, by supplying a market, have a decidedly beneficial effect upon the agricultural conditions of the districts nearest them.

³⁰ Hunt's Merchants' Magazine, vol. 15, 1846, p. 566.

Yet though the manufacturing interest of the years between 1840 and 1850 was not large, its significance cannot be measured by its size. Connecticut presented—doubtless in common with the other southern New England states—a phenomenon in industrial development never seen before: a state in the process of changing from the handicraft system of industry into the factory system, without going through the intermediate change of the domestic system. It was, moreover, a state with a new attitude toward mechanical employment.

The local histories of the Connecticut towns tell us the early stories of many of the firms which have lived and grown through the last century—some of them even now bearing the names of their founders. It is striking to note how many an early undertaking, starting as the shop of a handicraftsman with three or four apprentices, his sons or his neighbors' sons, passed so gradually that the steps are seldom recorded into a factory of the modern type. In eighteenth-century England the domestic system of manufacture, which later gave way to the factory system, had been essentially one in which the laborers did their work at home for a merchant-employer, an employer who knew little and cared less about the methods of manufacture, provided his workers did not steal too much of his raw material. The employer who gave out work looked upon himself as a philanthropist who by giving work to so many poor people kept them from starvation.

In America all was different. During the eighteenth century settling on the free land that was within reach of everyone was so much more attractive than wage-earning that the English laws against manufactures in the colonies were quite unnecessary to prevent their beginning. In the nineteenth century land was still free, though now it was further in the interior, and all through the first half of the century and well into the second, manufacturing had to compete with farming for laborers. A farmer's son who could move beyond the Alleghenies and settle there on fertile fields within reach of the ever-growing Southern market must be well paid if he were to be persuaded to stay at

home and work in a factory. The mechanical effect of this scarcity of factory labor upon the invention of labor-saving machinery has often been noted. Few have ever spoken of its spiritual effect upon the American people. Here there was no question of "giving work to the poor." Rather was there work that must be done, and he who was willing to do it could command his own terms; he was honored in his community, and if he was intelligent and skilful the step was short from factory labor into factory ownership. This respect for hand labor is a most precious part of the heritage of the American people. It is a respect so firmly grown into the fiber of the nation that it seems likely to survive even the withdrawal of the native Americans from the factories.

We have seen how the compilers of the Pease and Niles *Gazetteer* called any handicraftsman's shop a factory, in prophecy of the enlarged and ever growing organization which they pictured for the future. This identification of the craftsman's shop with the factory is significant of the difference between English and American economic development. Here the employment of laborers in their homes was essentially employment by a manufacturer rather than by a merchant. The making of boots and shoes is to a certain extent an exception, for the reason that the organization of the industry upon a capitalistic basis preceded the application of power to the making of the article. In almost every other industry home labor was used to supplement factory labor, and was discontinued as soon as some mechanism could be devised to do away with it.

A detailed description of the way home labor was used is found in the report of Mr. George Wallis, one of the English Commissioners to the New York Industrial Exposition in 1851:³¹

"Elastic webbings used in the making up of clothing, suspenders, gaiters, etc., are manufactured in the State of Connecticut; and the establishment of Messrs. Hotchkiss and Merriman, Waterbury, affords an illustration of the extent and mode of operation. There are several other concerns of a similar character, but this appears to be the largest. They spin the cotton yarn in one factory where 200 persons are employed,

³¹ Wallis, N. Y. Industrial Exhibition, p. 70.

manufacture the buckles and metallic mountings in another, and at a third factory the elastic webbing is produced; the threads of catchouc for intermingling with the warp being prepared on the premises, the weaving of the webbing being effected by power. About 150 persons are employed in the latter factory, where the webbing is afterwards cut to the requisite sizes for the various articles into which it is to be made up, the leather trimmings punched out to the proper forms, and then assorted into convenient quantities with the necessary metallic appendages. The materials thus prepared and assorted are distributed in the villages and farm-houses around, to be made up by females, in many instances at their hours of leisure from domestic employment, and by others as a means of obtaining a livelihood. Even little children, under the age at which the law of the State allows of their employment in manufactories, can be usefully engaged in some portions of the work thus undertaken at home. A waggon is used for sending round the materials and collecting the finished work. This visits a given district at stated periods, taking out fresh work and bringing back that distributed on the former journey. About 600 persons are thus employed at their own houses by Messrs. Hotchkiss and Merriman. The goods are made up into dozens and half-dozens and usually packed in ornamental boxes for distribution to the retail dealer. They consist of the commoner kind of such articles as used in England, but are of excellent make and quality."

Another side of the manufacturing development of the years between 1820 and 1850 must be considered: the difficulties that beset the early manufacturer. We are so accustomed in these days to regard the New England States as manufacturing communities that we seldom think how great must have been the ability and enthusiasm of those who gave the manufactures their firm roots, and of what quality a man must have been to succeed under the conditions that surrounded the manufacturers of the first half of the nineteenth century here in America. The early manufacturers were pioneers quite as truly as their brothers who had left New England for the Middle West; for not only must they win their way against bad roads, absence of raw materials, foreign competition, and their own lack of capital, but they must do it all by methods that had never before been used.

In 1819 the New Haven correspondent of the makers of the oft-quoted *Gazetteer* had been able to write:

"Whatever expectations may be indulged by the inexperienced, it is a fact, established by the united testimony of all men of practical knowledge, that the great majority of those engaged in business of every

kind, can realize but *small profits*. This is more emphatically true with respect to mechanical employments of every description."

In opposition to this medieval, handicraft idea of merely making a living, the mechanics of Connecticut deliberately set about making a profit, and in the course of the next half-century they developed an industrial system such as the world had perhaps never seen.

Another quotation from the report of the English commissioner to the New York Industrial Exposition will show how seriously the difficulties of these American manufacturers were regarded by their European contemporaries:

"Certainly the one thing which, more than any other, strikes the visitors to the seats of industrial skill in the United States is the ingenuity, the indomitable energy and perseverance displayed in overcoming the early difficulties which must have stood in the way of anything like successful progress at the outset.

"It is not, therefore, a matter of surprise that many skilled artisans have, from time to time, returned to Europe after an attempt to establish a manufacture, since the embarrassments arising out of almost unaided exertions and an isolated position were too great to allow them to do justice to themselves, or to those employers whose spirit and enterprise might have induced them to embark capital in such undertakings.

"The pecuniary loss of the latter has frequently been inevitable, and the early history of *nine-tenths* of the various branches of manufacture now flourishing in the United States, and amply repaying their present proprietors, is that of ruin or of enormous sacrifices on the part of those who had the hardihood to become pioneers in those arts which now promise to become, at no distant period, of vital importance to the well-being of millions of industrious men and women.

"Again, even to the present time, the isolation of manufactories in places at such a distance from each other that mutual aid is almost impossible, renders it imperative that each should be complete within itself, and that everything connected with its operations should be either manufactured on the premises, or kept in stock to such an extent as shall ensure a continuous supply.

"Thus, both the self-assistance and the laying in a stock of materials are carried to a much greater extent than the majority of English manufacturers would credit. This gives a great peculiarity to the manufacturing system of the States, so far as at present developed, and many of the manufacturers of Birmingham and Sheffield would soon close their doors if they had to furnish themselves with all the partially prepared materials for which they depend upon those whose business it is to manufacture them.

"Yet such is the position of large numbers of the most successful houses in the United States, and the difficulty is met with a tact and ingenuity of no ordinary kind.

"There can be no doubt, too, that this necessity for self-supply has been the means of originating many ingenious machines, for which the Americans have so deserved a reputation, as applicable to the manufacture of small articles, or portions of more complicated productions.

"Thus the very difficulty in procuring human labor, more especially when properly skilled and disciplined, which would assuredly be the greatest drawback to success, appears to have stimulated the invention of the few workers whose energies and skill were engaged in the early development of manufactures; and to this very want of human skill, and the absolute necessity for supplying it, may be attributed the extraordinary ingenuity displayed in many of those labour-saving machines, whose automatic action so completely supplies the place of the more abundant hand labour of older manufacturing countries."³²

³² Wallis, *N. Y. Industrial Exhibition*, pp. 3, 4.

CHAPTER VI

MANUFACTURES THE PREDOMINANT INTEREST

We have set out to trace some of the steps by which Connecticut has changed in the last hundred years from a loose collection of largely isolated and nearly self-sufficing rural communities into a highly organized manufacturing state. In our surveys of the state in 1818 and 1845 we have shown the beginnings of this change, seen what were the difficulties in the way of its coming, and what were the forces compelling it. In our study of the years since 1845 we should determine not only when Connecticut became predominantly a manufacturing state, but also when and how she became a highly-organized manufacturing state; for the later history of Connecticut manufactures is the story of their interrelation almost as much as of their growth.

It is not possible in a work like this to study thoroughly the manufacturing growth of the state since 1845. All that can be done is to open up the subject and perhaps find out what would be the most profitable lines to pursue. No complete report has been found on the state's manufactures, by towns, since the report of 1845. The later gazetteers are secondary sources and are not sufficiently full for our purposes. The United States census reports do not go below the county divisions. The method of study, therefore, has been the following:

(1) By means of the United States census figures of population to determine the date when Connecticut became predominantly a manufacturing state in the sense that more than one-half her people lived under urban conditions or may be assumed to have earned their living by manufacturing or by the occupations which in a complex social group are subsidiary to manufacturing.

(2) Having determined the date when Connecticut became predominantly a manufacturing state, to turn to the United States census next following that date and classify and summarize the figures for Connecticut manufactures there given.

(3) Having determined when manufacturing became the predominant interest of the state and of what kinds and how great this interest was, by noting population changes in the different towns of the state to find out where the manufacturing interest was located.

(4) By means of local histories, reports of industrial expositions, histories of industries, business catalogs, and any other kind of printed matter available, to find how the state's manufactures were distributed among these growing towns, what was the course of the technical development within the various industries, why the different kinds of manufactures settled and grew where they did, and what was the extent of interrelation between the industries and between the towns as industrial centers.

If one possesses diligence, the first three steps in the method are comparatively easy to follow. When we come, however, to the interpretation of the figures by means of miscellaneous printed matter we enter upon something of a very different kind. We meet immediately with the difficulty that the writers we are consulting did not have in mind the same things that we have in mind. The local histories were written at widely different dates, some are filled with biographical notices and steel engravings of selected men of the town whose willingness to pay to see themselves in print made possible the publication of the history. Others devote much attention to the history of the local churches. Most of them give but one or two chapters to the town's industries, and even these chapters contain little to suggest the courses of industrial development. The method usually followed is to give a brief history of the individual firms within the town, with references to the dates when partners came in or left the firms, and with but little to show what the firm was producing at any given time, except possibly at the beginning and at the date when the history was written. The other sources of our information are even less satisfactory than the local histories; for the writers are either interested in, or satisfied with, describing the firms from the point of view of one adver-

tising them. So far as has been discovered, we have but one monograph which deals with a Connecticut industry from an economic standpoint. This is a history of the rolled brass industry, written as a thesis for the doctor's degree in Yale University.

All this being as it is, it is obvious that a mere introduction to the history of Connecticut as a manufacturing state, cannot present adequately the industrial history of the years between 1845 and 1880, a period of great and complex growth. An examination of many of the sources on this period has made it clear to me that for an adequate presentation of the subject a first hand knowledge of industrial processes is essential. It has become my conviction, moreover, that such a presentation belongs of right in the history of Connecticut as a manufacturing state rather than in the introduction to such a history. This history I hope, some time, to write. The present study, therefore, will conclude with a summary of the results obtained from following the first three steps named on pages 51 and 52.

CONNECTICUT

SUMMARY OF POPULATION CHANGES 1840-1910

NOTATION:

- A—towns of ten thousand or more inhabitants (10,000).
 B—towns of five thousand to ten thousand (5,000-9,999).
 C—towns of three thousand to five thousand (3,000-4,999).
 D—towns of less than three thousand inhabitants.

A and B present urban conditions; a town in group C may present either rural or urban, probably both; a town in group D will present rural conditions.

(1) Number of persons living in towns of different sizes, 1840 to 1910.

	'40	'50	'60	'70	'80	'90	'00	'10
A	27,983	44,965	115,888	171,917	279,151	409,208	553,490	752,224
B	19,968	52,660	61,051	93,161	82,470	99,956	115,215	132,894
C	75,352	69,492	101,472	91,138	100,006	86,775	99,207	98,470
D	187,485	204,474	181,739	181,238	161,073	160,319	140,588	131,168
	<hr/>							
	309,978	370,792	460,147	537,454	622,700	746,258	908,420	1,114,756

(2) Number of towns of each size at successive censuses.

	'40	'50	'60	'70	'80	'90	'00	'10
A	2	3	6	8	13	15	18	21
B	3	8	9	13	13	15	16	19
C	21	18	28	25	28	23	27	26
D	115	121	116	118	113	115	107	102
	<hr/>							
	141	150	159	164	167	168	168	168

(3) Per cent of the state's population in towns of each size.

	'40	'50	'60	'70	'80	'90	'00	'10
A	8.7	11.9	25.18	31.99	44.81	53.78	60.92	67.48
B	6.4	14.2	13.26	17.33	13.25	13.39	12.68	11.92
C	24.3	18.74	22.05	16.95	16.06	11.62	10.92	8.83
D	60.6	55.06	39.51	33.73	25.28	21.21	15.48	11.77
	<hr/>							
	100.	100.	100.	100.	100.	100.	100.	100.

(4) Per cent of State's population in towns of each character.

	'40	'50	'60	'70	'80	'90	'00	'10
Urban	15.1	26.1	38.44	49.32	58.06	67.17	73.60	79.4
Urban or rural....	24.3	18.74	22.05	16.95	16.06	11.62	10.92	8.83
Rural	60.6	55.06	39.51	33.73	25.28	21.21	15.48	11.77
	<hr/>							
	100.	100.	100.	100.	100.	100.	100.	100.

By these figures and by the accompanying diagram it is shown that not until the decade between 1870 and 1880 were more than half of the inhabitants of Connecticut living under urban conditions. In the years between 1840 and 1870 the population had increased 73%. By 1880 it was double what it had been in 1840. In this same time, the number of people living in towns of less than 3,000 had decreased from 187,485 to 161,073, a decrease of 14%. The number of such towns had decreased from 115 to 113, so that the size of the average rural town had changed from 1530 to 1434. On the other hand, the number of persons living in towns of more than 10,000 had increased from 27,183 to 279,151, a tenfold increase. The number of towns in this class had grown from two to thirteen. Since Connecticut possesses no important commercial center like New York or Boston it is fair to conclude that this increase in urban population is also a growth in manufacturing population.

A supplementary proof of the statement that it was in the decade 1870 to 1880 that Connecticut became predominantly a manufacturing state, in the sense that more than half her people earned their living by manufacturing or by occupations subsidiary to manufacturing, is found in the fact that in 1870 her population was almost exactly twice what it had been in 1820. It was shown on page 26 that the population of the state in 1820, approximately 275,000, was as large a number as the soil of the state could support by agriculture under the agricultural conditions of that time. It is interesting to note in this connection a statement made by Mr. Howard Elliott, chief executive officer of the New York, New Haven, and Hartford Railroad, in an article entitled, "Agriculture in Connecticut," published in 1912.³³ He says, "This great state . . . to-day produces but 25 per cent of what her people consume. Her consumption of food products amounts to over \$80,000,000 a year, and she produces less than \$20,000,000." The population of Connecticut at the last census was almost exactly four times what it was in 1820.

Having determined the date when Connecticut became predominantly a manufacturing state, we turn next to the United States census report on manufactures for 1880 to find of what kinds and how great was her manufacturing interest at this date. For greater intelligibility, the industries are taken out of the alphabetical order of the Census Report and are rearranged more nearly in the order followed in the British census.

CONNECTICUT MANUFACTURES IN 1880³⁴

	Average Number Employed	Value of Output
ALL INDUSTRIES	112,915	\$185,697,211
TEXTILES		
cotton goods	14,938	\$17,050,126
woolen goods	6,956	16,892,284
silk, silk goods	3,338	5,881,000
dyeing and finishing textiles...	303	464,800

³³ Connecticut. Industrial, Agricultural, etc., p. 12.

³⁴ U. S. Census, 1880. Manufactures: Connecticut by specified industries, pp. 96-99.

felt goods	174	429,496
worsted goods	490	1,597,227
shoddy	139	347,500
mixed textiles	2,948	5,919,505
carpets	1,654	2,500,559
hosiery, knit goods	2,211	2,432,271
	33,150	\$53,514,768
DRESS		
clothing, men's	1,605	\$2,210,159
shirts	1,071	699,605
corsets	4,374	3,322,359
boots and shoes	1,540	2,372,293
hats and caps, not wool.....	3,185	4,407,993
hat and cap materials	416	743,551
wool hats	539	1,003,992
	12,730	\$14,759,852
CARRIAGES		
carriages and wagons	1,648	\$2,605,591
carriage and wagon materials..	488	824,611
	2,136	\$ 3,430,202
INDIA RUBBER		
rubber and elastic goods.....	622	\$1,710,761
rubber shoes	2,112	4,175,997
rubber belting, hose	224	850,000
	2,978	\$ 6,736,758
PAPER	1,702	\$ 4,337,550
AMMUNITION	871	\$ 1,706,852
METAL INDUSTRIES		
Hardware		
small hardware	8,244	\$10,374,293
screws	120	210,000
iron and steel bolts, nuts, washers, rivets	961	1,662,131
saddlery hardware	270	570,000
nails and spikes	44	120,000
bells	160	251,024
cutlery, edge tools	2,659	2,704,708
	12,458	\$15,892,856
Brass		
brass castings	668	\$1,077,700
brass and copper, rolled.....	4,226	10,985,471

brassware	931	1,134,884
buttons	1,237	1,110,653
hooks and eyes	149	251,000
gas and lamp fixtures.....	915	1,000,000
lamps and reflectors	85	102,800
needles and pins.....	492	804,985
wire.....	528	890,481
electrical supplies.....	54	102,800
	9,285	\$18,451,594
Plated and Britannia ware.....	2,903	\$ 6,080,076
Miscellaneous		
foundry and machine shop		
products.....		
tools.....	4,781	\$6,339,599
files.....	1,007	1,631,295
iron forgings.....	47	49,675
agricultural implements.....	281	512,620
saws.....	565	719,627
springs, steel, car and car-	5	5,500
riage	298	622,841
steam fitting and heating		
apparatus	352	757,422
tinware, copper wire, sheet		
iron work.....	453	827,162
stamped ware	195	200,000
	7,984	\$11,665,741
Complex Machines		
clocks and clock cases and		
materials	2,616	\$3,067,217
sewing machines and attach-		
ments.....	2,088	2,969,741
firearms.....	2,389	2,470,398
	7,093	\$ 8,507,356

CONNECTICUT MANUFACTURES 1880 RECAPITULATION

	Average Number Employed	Value Output
Textiles	33,150	\$53,514,768
Dress	12,730	14,759,582
Carriages	2,136	3,430,202
India rubber	2,978	6,736,758
Paper	1,702	4,337,550
Ammunition	871	1,706,852

METAL INDUSTRIES

Hardware	12,458	\$15,892,856
Brass	9,285	18,451,594
Plated, brit. ware.....	2,903	6,080,076
Miscellaneous	7,984	11,665,741
Complex machines	7,093	8,507,356
	39,723	\$60,597,623
Total, selected industries	93,290	\$145,083,335
Total of state manufactures	112,915	\$185,697,211

The next and last of the three steps to be taken in concluding this introduction to the history of Connecticut as a manufacturing state is to determine among what cities and towns this manufacturing was distributed.

Because of our earlier surveys of manufacture in the state, we are not surprised by the names of the towns which in 1880 contained more than 10,000 inhabitants. Since 1845 three towns had come into the list of cities; these were, Waterbury in 1853, Meriden in 1867, and New Britain, which in 1845 was still a village in the town of Berlin, in 1870.

GROWTH OF LARGER CONNECTICUT TOWNS 1840 TO 1880

	1840	1850	1860	1870	1880
New Haven.....	14,390	20,345	39,267	50,840	62,882
Hartford	12,793	13,555	29,152	37,743	42,551
Bridgeport	4,570	7,560	13,299	19,835	29,148
Norwich	7,239	10,265	14,048	16,653	21,143
Waterbury	3,668	5,137	10,004	13,100	20,270
Meriden	1,800	3,559	7,426	10,495	18,340
New Britain.....		3,029	5,212	9,480	13,979
Norwalk	3,863	4,651	7,582	12,119	13,956
Middletown	7,210	8,441	8,620	11,126	11,732
Danbury	4,504	5,964	7,234	8,753	11,666
Derby	2,851	3,824	5,443	8,020	11,650
Stamford	3,516	5,000	7,185	9,714	11,297
New London.....	8,991	10,115	9,576	10,537	10,757

Though it is not planned in this study to go very far behind these figures to show the reason for these differing rates of growth, a few words of explanation may well be written. Hartford's slow rate of growth between 1840 and 1850 was occasioned by the cutting off of a large part of her territory to make

the town of West Hartford, which in 1850 had a population of 4,411. Similarly, the town of Bethel, which in 1860 had a population of 1,711, was taken from Danbury in 1855.

Bridgeport's rapid growth was occasioned by her manufacture of sewing machines, corsets, and metallic rim-fire cartridges, all of them new industries since 1845, and by her growing participation in the brass industry. Waterbury and Derby show how rapid was the expansion of the demand for rolled brass and its manufactures. If the population of the smaller towns in the Naugatuck Valley were to be added to these, the expansion would be even better realized. The census figures show what were some of the new uses for brass that had developed since 1845, but do not mention the fact that the German silver foundation for the plated silverware made in Meriden, the "Silver City," was made in these brass rolling mills of the Naugatuck Valley. The demand for brass which in the years since 1880 has outstripped all the others, the need of it for electrical supplies, is shown in its small beginnings in the census report for 1880.

Middletown here is shown to be lagging behind the other cities, but this is even more marked in the case of New London, the one city of Connecticut which had depended upon fishing and commerce rather than upon manufactures. Norwich alone among the textile towns of the eastern half of the state appears in this list; a comparison of the rate of growth of the Connecticut textile towns during this period with the textile towns of Massachusetts and Rhode Island would show a marked retardation here.

New Haven's increase came from her making of carriages and, later, of hardware, corsets, and firearms; Hartford's from various things, but chiefly from her metal working machinery, and her insurance interests.

In this year of war, when the demand for firearms is so unprecedentedly large, it is interesting to note how much Connecticut has contributed to the firearm industry of the world. The Colt revolver and the Gatling gun of Hartford, the Sharp's breech-loading rifle of Hartford and later of Bridgeport, the Union

metallic cartridge of Bridgeport, and the Winchester repeating rifle of New Haven have all added to Connecticut's fame. Less well known brands of small arms have long been made in the state, and one firm of Hartford has made gun making machinery which has been sent all over the world, even to the royal arsenals of Germany—Spandau, Erfurt, and Dantzig.

NOTE

Since this monograph has been put into type the author has found in the uncatalogued canal material in the library of Yale University a pamphlet with the following title: "Considerations on the practicability and importance of opening a navigation to the interior of the state, by the Housatonick River," New Haven, 1822. It refers to a meeting of the inhabitants of Derby, Connecticut, February 15, 1822; and from it the following pertinent extract is taken (pp. 4-7):

"About one eighth part of the population of the state inhabit the fifteen towns adjoining the Housatonick; at least one fifth could, at less expense, and with greater convenience than by any other possible channel, were it navigable, communicate with the Sound by its waters; and a little less than one fourth reside in towns, some part of whose limits are within ten miles of its banks—a population less by about 5000 only than according to the same calculation, live within an equal distance of Connecticut river. (P. 5) If it were correct to estimate the ratio of marketable productions and internal trade by that of population, it will follow, that nearly one fifth part of the aggregate of land transportation in the state, and that over its most hilly roads, if the Housatonick were navigable, would be exchanged for water carriage. This transportation is at present to places on the Connecticut river, on the Hudson, and on the Sound—probably in a greater proportion to the latter, and over a distance varying from 20 to 70 miles. No data are known by which the extent and expense of it can be accurately estimated. If we suppose 20,000

tons to be its present annual extent; this carried a medium distance of 45 miles, at \$12 per ton, would give \$240,000 for its annual expense. This statement is probably less than the fact. Of this sum, at least 5-6ths, 200,000 dollars, might be annually saved to the farmer and manufacturer, and would be added to the value of their articles at their doors and shops, could convenient water communication be resorted to. To a sacrifice on the value of their productions bearing any proportion to this, no other section of the state, of half the extent, is subjected. Those living in the neighborhood of Connecticut river, or of the Sound, realize the full value of the productions of their soil and their industry, while their equally deserving fellow citizens of the interior, north and west of them, are compelled to compromise the one moiety of the value of theirs to deliver the other to market. Every bushel of grain, and ton of timber, and foot of building stone and marble, on the principal (P. 6) that equal industry is entitled to equal rewards, ought to be worth as much to the owner on the banks of the Housatonick, as on those of the Connecticut; and would be, but for the difference in the expense of transportation; and the same ought to be the prices of the salt, molasses, plaister, and other articles consumed by both. The articles raised and manufactured are nearly the same in both places. Yet a ton of plaister, which costs the farmer of Connecticut river \$5, costs one at New-Milford from \$10 to 12, and at Canaan, at the usual rate of transportation from the Sound, about \$17. A ton of ship timber is worth to the former from \$10 to 15, yet to one of the latter it is valueless, and to the other nearly so. This parallel might be followed with the same results, through most of the articles of produce and consumption.

“But it would be confining our view of the advantages of the proposed navigation within too narrow limits, to regard it as as affecting, in this portion of territory, those articles only which are at present marketable. In a public point of view, the interest connected with the subject is increased in proportion as it can be brought to aid the applications of industry and skill in the successful improvement of *all* the means of wealth and comfort,

which the natural productions and adaptation of the country, place within its reach. A country abounding with frequent and never failing mill-streams is adapted to manufactures, requiring water power. Add to this an abundance of the raw material on its own soil, and a ready and contiguous market is only wanting to insure it comfort and wealth. (P. 7) Of exactly this description, except the market, is the country under consideration. Its forests are yet extensive. The recent enlarged demand for ship timber in the neighborhood of the Housatonick is a proof of its good quality and great value. The amount in value of this article shipped to New York from the head of the tide waters of this river, only during the past summer, probably exceeded \$20,000, besides a considerable amount in timber of other descriptions. Of this article, and timber fitted for other purposes, and wood, the quantity is yet immense.

“The region of this river contains also inexhaustible quantities of limestone, and flagging and building stone, interspersed, from Stockbridge to the head of the present navigation. Iron ore is also found in considerable quantities, and it ought not to be forgotten, that the marble now most in use in Connecticut, even under the present expensive transportation, comes from this quarter, and the heaviest articles of manufacture in the state are wrought at its only successful forges, on the banks of the Housatonick. Remove but the expense of land carriage, and reduce it to the standard of canal transportation, and it is very easy to see that from the sources, and others which might be enumerated a mass of materials, scattered through this region, now inactive and unheeded as sources of profit, would assume a value and productiveness under the hand of industry, increasing to an amount beyond any probable estimate.”

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