

THE GROWTH

OF THE

COTTON INDUSTRY IN AMERICA.

THE first culture of cotton in the United States for the purpose of raising a material to be worked up into a fabric was pursued on the peninsula between the Chesapeake and Delaware Bays as early as 1736, it having been before that time chiefly regarded as an ornamental plant, and reared only in gardens on the eastern shore of Maryland, the lower counties of Delaware, and occasional localities in the Middle States. Previously to this date—about 1733—its culture seems to have been experimentally undertaken in South Carolina, where it was to be met with in gardens. An exportation of seven bags from Charleston, in 1747-8, is recorded; but doubt is thrown upon its growth in the colony. A few years later it was a recognized production of the Carolinas, in a very small way, as also of French Louisiana. But cotton was not to any appreciable extent a production of the Southern States anterior to the Revolutionary War, and its use as a material to be spun and woven, with its relative value as an article of national wealth, was hardly thought of in comparison with hemp and flax. Whatever was raised was consumed at home, and in 1770 the total entries of American cotton at Liverpool amounted to three bales from New York, four from Virginia and Maryland, and three barrels from North Carolina.

In 1784 an importation of eight bags of cotton at Liverpool was seized, on the assumption that so large a quantity could not have been of American production. The next year, however, the exportation from Charleston regularly commenced, one bag being shipped to England from that city. During the same twelvemonth twelve bags were entered at Liverpool from Philadelphia, and one from New York. The increase thenceforward was marked. The bag averaged 150 lbs., and from 1786 to 1790 the following quantities were exported: 1786, 6 bags; 1787, 109 bags; 1788, 389 bags; 1789, 842 bags; 1790, 81 bags—aggregating 1441 bags, or 216,150 lbs.

In 1786 the culture of cotton had become so successful that Mr. Madison, in a convention at Annapolis, Md., called to consider the depressed condition of the country, remarked, in his address, that "there was no reason to doubt the United States would one day become a great cotton-growing country."

The invention of the cotton-gin by Eli Whitney in 1793-4, by which the labor of one man could clean for market a thousand pounds of cotton instead of the five or six pounds by the usual hand process, at once gave an impulse to the culture of the plant. In 1795 South Carolina exported \$1,109,653 in value of production, and the growth of the whole country reached 8,000,000 lbs., of which three quarters were shipped abroad. In 1801 the product aggregated 40,000,000 lbs., of which half was exported, South Carolina alone yielding 8,000,000 lbs.

The following table, carefully prepared by B. F. Nourse, Esq., of Boston, and perfected to the present time, shows the total annual production of cotton in the United States from 1825 to the present year, inclusive :

| Years ending August 31. | Production. Bales. | Consumption. Bales. | Exports. Bales. | Average Net Weight per Bale. | Average Price per lb. N. Y. Cents. |
|-------------------------|--------------------|---------------------|-----------------|------------------------------|------------------------------------|
| 1825-'26 | 720,027 | .... | .... | ... | 12.19 |
| 1826-'27 | 957,281 | 149,516 | 854,000 | 331 | 9.29 |
| 1827-'28 | 720,593 | 120,593 | 600,000 | 335 | 10.32 |
| 1828-'29 | 870,415 | 118,853 | 740,000 | 341 | 9.88 |
| 1829-'30 | 976,845 | 126,512 | 839,000 | 339 | 10.04 |
| 1830-'31 | 1,038,847 | 182,142 | 773,000 | 341 | 9.71 |
| 1831-'32 | 987,477 | 173,800 | 892,000 | 360 | 9.38 |
| 1832-'33 | 1,070,438 | 194,412 | 867,000 | 350 | 12.32 |
| 1833-'34 | 1,205,394 | 196,413 | 1,028,000 | 363 | 12.90 |
| 1834-'35 | 1,254,328 | 216,888 | 1,023,500 | 367 | 17.45 |
| 1835-'36 | 1,360,725 | 236,733 | 1,116,000 | 373 | 16.50 |
| 1836-'37 | 1,423,930 | 222,540 | 1,169,000 | 379 | 13.25 |
| 1837-'38 | 1,801,497 | 246,063 | 1,575,000 | 379 | 10.14 |
| 1838-'39 | 1,360,532 | 276,018 | 1,074,000 | 384 | 13.36 |
| 1839-'40 | 2,177,835 | 295,193 | 1,876,000 | 383 | 8.92 |
| 1840-'41 | 1,634,954 | 267,850 | 1,313,500 | 394 | 9.50 |
| 1841-'42 | 1,683,574 | 267,850 | 1,465,500 | 397 | 7.85 |
| 1842-'43 | 2,378,875 | 325,129 | 2,010,000 | 409 | 7.25 |
| 1843-'44 | 2,030,409 | 346,750 | 1,629,500 | 412 | 7.73 |
| 1844-'45 | 2,394,503 | 389,000 | 2,083,700 | 415 | 5.63 |
| 1845-'46 | 2,100,537 | 422,600 | 1,666,700 | 411 | 7.87 |
| 1846-'47 | 1,778,651 | 428,000 | 1,241,200 | 431 | 11.21 |
| 1847-'48 | 2,439,786 | 616,044 | 1,858,000 | 417 | 8.03 |
| 1848-'49 | 2,866,938 | 642,485 | 2,228,000 | 436 | 7.55 |
| 1849-'50 | 2,233,718 | 613,498 | 1,590,200 | 429 | 12.34 |
| 1850-'51 | 2,454,442 | 485,614 | 1,988,710 | 416 | 12.14 |
| 1851-'52 | 3,126,310 | 689,603 | 2,443,646 | 428 | 9.50 |
| 1852-'53 | 3,416,214 | 803,725 | 2,528,400 | 428 | 11.02 |
| 1853-'54 | 3,074,979 | 737,236 | 2,319,148 | 430 | 10.97 |
| 1854-'55 | 2,982,634 | 706,417 | 2,244,209 | 434 | 10.39 |
| 1855-'56 | 3,665,557 | 770,739 | 2,954,606 | 420 | 10.30 |
| 1856-'57 | 3,093,737 | 819,936 | 2,252,657 | 444 | 13.51 |
| 1857-'58 | 3,257,339 | 595,562 | 2,590,455 | 442 | 12.23 |
| 1858-'59 | 4,018,914 | 927,651 | 3,021,403 | 447 | 12.08 |
| 1859-'60 | 4,861,292 | 978,043 | 3,774,173 | 461 | 11.00 |

| Years ending August 31. | Production. Bales. | Consumption. Bales. | Exports. Bales. | Average Net Weight per Bale. | Average Price per lb. N. Y. Cents. |
|-------------------------|--------------------|---------------------|-----------------|------------------------------|------------------------------------|
| 1860-'61 | 3,849,469 | 843,740 | 3,127,568 | 477 | 13.01 |
| 1861-'62 | ..... | ..... | ..... | ..... | 31.29 |
| 1862-'63 | ..... | ..... | ..... | ..... | 67.21 |
| 1863-'64 | ..... | ..... | ..... | ..... | 101.50 |
| 1864-'65 | ..... | ..... | ..... | ..... | 83.38 |
| 1865-'66 | 2,269,310 | 666,100 | 1,554,654 | 441 | 43.20 |
| 1866-'67 | 2,097,254 | 770,630 | 1,557,054 | 444 | 31.59 |
| 1867-'68 | 2,519,554 | 906,636 | 1,655,816 | 445 | 24.85 |
| 1868-'69 | 2,366,467 | 926,374 | 1,465,880 | 444 | 29.01 |
| 1869-'70 | 3,122,557 | 865,160 | 2,206,480 | 440 | 23.98 |
| 1870-'71 | 4,362,317 | 1,110,196 | 3,166,742 | 442 | 16.95 |
| 1871-'72 | 3,014,357 | 1,237,330 | 1,957,314 | 443 | 20.98 |
| 1872-'73 | 3,930,508 | 1,201,127 | 2,679,986 | 464 | 18.15 |
| 1873-'74 | 4,170,388 | 1,305,943 | 2,840,981 | 466 | 19.30 |
| 1874-'75 | 3,832,991 | 1,207,601 | 2,684,410 | 468 | 18. |
| 1875-'76 | 4,669,288 | 1,356,598 | 3,252,994 | 471 | 13. |

The history of cotton manufacture in the United States commences with the organization of a factory at Beverly, Mass., in 1787. Previously whatever cotton had been made into cloth had been spun on the ordinary spinning-wheel, which was a property of nearly every household, and woven on the hand-loom. The first spinning-jenny seen in America was exhibited in Philadelphia, in 1775, constructed by a Mr. Christopher Tully after the plan of Hargreaves. This machine, spinning twenty-four threads, was secured by an association of persons desirous to establish domestic enterprise, who formed themselves into a company, termed "The United Company of Philadelphia for Promoting American Manufactures." This Company, besides operating Tully's machine, employed four hundred women in hand-spinning and weaving. The Company was speedily a success, the stock rising from its par value of £10 to £17 6s. 6d. in two years. The business, however, was not long carried on by the Company, but in a few years was controlled by one of the directors, Samuel Wetherill, who during the Revolution had contracts for woollen fabrics for the army.

Though some years before the close of the war the spinning-frames of Arkwright had been operated in England, it was next to impossible to procure patterns, or even drawings, of them for the United States. Not only did parliamentary legislation prohibit the exportation of new inventions, but the statutes were rigidly enforced, to the degree even of searching private effects and preventing the emigration of skilled artificers from the country. Thus in 1786 a complete set of brass models of Arkwright's machines, packed for Philadelphia, was seized on the eve of shipment; and in 1784 a German was fined £500 for attempting to form a colony of English workmen for one of the Low Countries.

In 1786, the Hon. Hugh Orr, of Bridgewater, Mass., employed two brothers, Robert and Alexander Barr, recently come from Scotland, to construct for him, at his machine-shops, three carding, roving, and spinning machines. It is probable Col. Orr did not contemplate himself inaugurating a manufacturing enterprise, but was actuated by a desire to promote a new industry. At any rate he succeeded in securing a favorable report from a Legislative committee appointed to examine the machines, and a grant of £200 to the machinists, supplemented by the gift of six tickets in the State Land Lottery, in which there were no blanks, "as a reward for their ingenuity in forming those machines, and for their public spirit in making them known to this Commonwealth."

The cost of the machines was £187, and they included probably the first stock card in the country.

The approval of the Commonwealth was next given to a model of an early and imperfect form of Arkwright's water-frame, brought from England by Thomas Somers. Col. Orr, still the medium of the State's liberality, was commissioned to advance £20 to the artisan, who had visited England at his own risk and expense, for the purpose of perfecting his construction, which was exhibited with the machines of the Barr Brothers, and called the "State's Model." A water-frame, built from drawings made after this model by Daniel Anthony, of Providence, who had engaged with Andrew Dexter and Lewis Peck to establish a manufacture of jeans and other "homespun cloth" of linen warp and cotton filling, was subsequently set up and operated in Providence.

The factory at Beverly, previously alluded to as the first establishment in the United States actually producing cloth by machinery, was equipped with one or more spinning-jennies and a carding-machine, the latter imported at a cost of \$1100. The Legislature appropriated £500 as a public aid to the enterprise. The factory was visited by General Washington during his New England tour in 1789, and his diary refers to the processes pursued as follows: "In this manufactory they have the new invented carding and spinning machines. One of the first supplies the work, and four of the latter, one of which spins 84 threads at a time by one person. The cotton is prepared for these machines by being first (lightly) drawn to a thread on the common wheel. There is also another machine for doubling and twisting the threads for particular cloths; this also does many at a time. For winding the cotton from the spindles and preparing it for the warp, there is a reel which expedites the work greatly. A number of looms (fifteen or sixteen) were at work with spring shuttles, which do more than double work. In

short, the whole seemed perfect, and the cotton stuffs which they turn out excellent of their kind; warp and filling both cotton."

The Beverly factory was a brick structure run by horse-power, a pair of large bay horses, driven by a boy, giving motion to the wheels. The establishment, under the management of John Cabot and Joshua Fisher, was continued for some years. The raw cotton was obtained from the West Indies in exchange for fish, "the most valuable export in possession of the State." In 1790, in answer to a petition for State aid, another grant of £1000, to be raised in a lottery, was made conditionally upon the proceeds being used "in such a way as will most effectually promote the manufacturing of cotton piece goods in this Commonwealth."

Up to this time (1790), it is believed—notwithstanding the efforts of Somers and the Barrs to construct Arkwright's machinery—that spinning was done at Beverly and in Rhode Island by the jenny alone. The Bridgewater essays, probably imperfect realizations of a very crude original knowledge of the English invention, had served but to stimulate the public mind to patronize domestic enterprise.

In such a situation of the industry, the *deus ex machina* appeared in the person of Samuel Slater.

Samuel Slater, a native of Derbyshire, born in 1768, when fourteen years of age was apprenticed to Jedediah Strutt, at Milford, a cotton manufacturer and partner with Sir Richard Arkwright in the spinning business. He served Mr. Strutt the full time of his engagement (six years and a half), and continued still longer with him superintending the construction of new works, his design in so doing being to perfect his knowledge of the business in every department. Previous to the termination of his apprenticeship, Slater had read a newspaper account of the interest awakened in America, and the bounties offered for the production of suitable machinery for cotton manufacture, and had quietly determined, after thoroughly familiarizing himself with the improved machine processes, to try his fortune in the New World.

Aware of the impossibility of taking away models or drawings, as the custom-house officers scrupulously searched every passenger, Slater pursued his study of the minutiae of the business with the most diligent and thoughtful exactness of observation, and—thanks to a rare retentiveness of memory controlled by a very clear and positive brain power—made himself an absolute master of the industry in all its details.

On the 17th of November, 1789, he landed at New York. The following January, dissatisfied with the opportunities offered by the New York Manufacturing Company, with which he had corresponded, for developing

his ideas, he came to Providence and contracted with Brown & Almy to produce a "perpetual card and spinning" system for them. This firm, at the head of which was the then venerable Moses Brown, had already operated a sort of hybrid spinning device constructed after the Bridgewater designs, which turned out "too imperfect to afford much encouragement," and was predisposed to patronize the thorough acquirements of one who claimed to have worked under both Strutt and Arkwright. On the 18th of January, Mr. Brown took Slater out to Pawtucket, and, providing him with the needed facilities, set him at once at the production of the improved machines. Laboring almost entirely by himself, Slater succeeded on the 20th of December in starting three cards, drawing and roving, with seventy-two spindles, entirely upon the Arkwright principle. They were run by the water-wheel of an old fulling-mill for the period of twenty months.

In April, 1793, Almy, Brown & Slater erected a small mill, known to this day in Pawtucket as the Old Factory, running at first seventy-two spindles, and gradually increasing machinery and space as the business warranted.

In 1798 Slater, associating himself with Oziel and William Wilkinson and Timothy Green, under the firm name of Samuel Slater & Co., started a new factory in Pawtucket. In 1806, in connection with his brother John, who came from England bringing a knowledge of the most recent improvements and processes, he organized a new establishment in Smithfield, R. I., which developed into the present large village of Slater'sville.

David Anthony, one of the founders of cotton manufacturing in Fall River, who died in 1867, from 1808 to 1812 was in the employ of Samuel Slater, and of the brothers Wilkinson. For the former he entertained a most exalted esteem, often speaking of him as "the father of the cotton manufacturing business in this country." "He was not only a manufacturer of cotton and the first in the business, as machinist and mathematician, but he was a rare business man. He was always attired in his business suit of velvets" (the dress worn in the cotton mills of the period), "and looked like an overseer so far as outward appearance indicated his position. His pay for taking the agency of two mills was \$1.50 per day from each. He was, of course, by no means an educated man, but he was a constant worker, saying of himself that sixteen hours' labor a day, Sundays excepted, for twenty years, had been no more than fair exercise."

The introduction of the Arkwright "perpetual spinning" system by Samuel Slater gave an almost immediate impulse to cotton manufacturing throughout the country. Several persons, learning the processes under him, left his employment and started individual enterprises. The celebrated

"New York Mills" at Utica originated in a small factory put up in 1807-8, by B. S. Wolcott, Jr., who worked in Pawtucket. The first factory in New Hampshire was put in operation in 1804, by one Robbins, another of Slater's graduates. At Cumberland, R. I., a mill was started in 1801; and at Rehoboth, Mass., opposite to Pawtucket, R. I., a second factory (the first being Slater's "White Mill") was erected in 1805.

The Secretary of the Treasury, Mr. Gallatin, in his report on domestic industry, April 17, 1810, made the following statement: "During the three succeeding years, ten mills were erected or commenced in Rhode Island, and one in Connecticut, making altogether fifteen mills erected before the year 1808, working at that time 8000 spindles. Returns have been received of 87 mills, which were erected at the end of the year 1809, 62 of which were in operation, and worked 31,000 spindles, and the other 25 will be in operation in the course of the year 1810."

According to Benedict's *History of Rhode Island*, in 1809 "there were 17 cotton mills in operation within the town of Providence and its vicinity, working 14,296 spindles; and in 1812 there were said to be, within thirty miles of Providence, in the State of Rhode Island, 33 factories, of 30,660 spindles; and in Massachusetts 20 factories, of 17,370 spindles, making 53 factories, running 48,030 spindles.

Cotton factories were started at Watertown, Mass., in 1807; at Fitchburg in 1807; at Dedham in 1808; in Dorchester in 1811, and in Waltham in 1813. In 1808 the companies at Peterborough and Exeter, N. H., were organized; in 1809, one at Chesterfield; in 1810, one at Milford, Swanzey, Cornish, and Amoskeag Falls; in 1811, one at Walpole, Hillsborough, and Meredith; there being at the commencement of the second war probably fifteen cotton mills in New Hampshire, operating from six to seven thousand spindles.

The first cotton factory in Maine, then a district of Massachusetts, was built at Brunswick in 1809.

The Census of 1810 furnishes the following classification of the industry by States:

| | | | |
|--------------------|----|----------------------------|----|
| Massachusetts..... | 54 | Pennsylvania..... | 64 |
| New Hampshire..... | 12 | Delaware..... | 3 |
| Vermont..... | 1 | Maryland..... | 11 |
| Rhode Island..... | 28 | Ohio..... | 2 |
| Connecticut..... | 14 | Kentucky..... | 15 |
| New York..... | 26 | Tennessee..... | 4 |
| New Jersey..... | 4 | (None in any other State.) | |

The war of 1812, of necessity raising the price of cloth extraordinarily (articles, previously imported from England, and sold at 17 to 20 cents per

yard, bringing 75 cents by the package), stimulated the infant industry in such a degree, that at its close there were reported, within a short radius of Providence, 96 mills, aggregating 65,264 spindles. The average number of spindles in mills of the period was 500; the largest in the country, that of Almy, Brown & Slater, ran 5170.

In 1815 was compiled for a committee of manufacturers a statement of the number of mills and spindles in Rhode Island, Massachusetts, and Connecticut. This statement, made for the purpose of providing a just basis for assessment to pay the expenses of an agent to represent the manufacturing interest before Congress, furnishes the subjoined items:

| | Mills. | Spindles. |
|--------------------|--------|-----------|
| Rhode Island..... | 99 | 68,142 |
| Massachusetts..... | 52 | 39,468 |
| Connecticut..... | 14 | 11,700 |
| | <hr/> | <hr/> |
| | 165 | 119,310 |

The Committee on Manufactures of the United States House of Representatives the same year, in a report to Congress, tabulated the condition of the cotton-manufacturing industry, as follows:

| | |
|---|--------------|
| Capital..... | \$40,000,000 |
| Males employed, of the age of 17..... | 10,000 |
| " " under 17..... | 24,000 |
| Females, including children..... | 66,000 |
| Wages of 100,000, averaging \$1.50 per week (<i>sic</i>)..... | 15,000,000 |
| Cotton manufactured, 90,000 bales..... | 27,000,000 |
| Number of yards..... | 81,000,000 |
| Cost, averaging 30 cents per yard..... | 24,300,000 |

Succeeding the close of the war of 1812, and prior to the effective operation of the tariff of 1816, a severe and general depression fell upon the industry, many companies suspending, and the strongest struggling on with difficulty.

From 1815 to 1820, a second revolution in the business, hardly less important in its results than the introduction of the water spinning-frames had been, was to be experienced in the addition of the power-loom to the series of mill processes. Previously to this application of power, the work of manufacture in the factory had been limited to the carding, drawing, and spinning stages. The product of yarn was sent out to be woven into cloth on hand-looms, and, as will be seen in subsequent pages, more than half the drudgery and detail of the mill agent was to conduct the manifold and complex system of outside production. The mills in the neighborhood of Providence kept wagons running constantly into the rural districts, inva-

ding both Massachusetts and Connecticut, bearing out yarn to be woven and returning with the product of the hand-loom, worked by the farmers' wives and daughters of the country side. In the period anterior to the introduction of jennies and water-frames, and the assembling of the different stages of preparation under organized systems of factory labor, all the details of cloth-making had been the legitimate pursuits of the domestic circle. Thomas Jefferson—who was himself a household manufacturer of this early type, having two spinning-wheels, a carding-machine, and a loom in his dwelling, by which his home folk made more than two thousand yards of cloth annually—though finally an advocate and even a partisan of organized factory industry, was in 1786 an eloquent writer in behalf of the time-honored custom of production in the family. It was not, indeed, without at least a show of resistance, that the old style gave way to the new, the former subsidizing the same art of invention to its support, through which the latter has won its eventual triumph. In 1812, when the water-frame with its seventy-two or more spindles was building up the industry in constantly increasing mills, portable spinning-frames capable of spinning from six to twenty-four threads, made expressly for family use, were sold about the country, meeting particular welcome in districts remote from the manufacturing centres. The construction of these domestic jennies and billys—as they were termed—was pursued on quite a large scale. The twelve-spindle billy sold for \$48; the carding-machine, suitable for a large household, \$60; the spinning-machine, for cotton, of twelve spindles, \$25; and the loom, with flying shuttle, weaving twenty yards a day, \$65. At the great Industrial Exhibition of this first Centennial of the Nation, in the American department, were to be seen instances not only of the old foot-worked spinning-wheel, but likewise of these later more pretentious devices, by which the lingering spirit of old time housewifery sought to assert itself against the progressive future.

The power-loom, though invented by Cartwright and put in operation at Doncaster, in 1785, was not recognized as a success, or even as a practicable suggestion, when Samuel Slater left the old country. Improved by various succeeding inventors, and finally made practical through the warp-dressing appliance of Radcliffe and Ross, and the modifications of its working details by Horrocks in 1813, it had by that year become an object of favorable consideration with the English manufacturers, and, despite the riotous antagonism of the hand weavers, two thousand four hundred were in use in Great Britain. Some years prior to this, rumors of the invention had reached the United States, and (though as in the case of the water-frames the impossibility of securing models or drawings of the invention was well enough

known) stimulated the leaders of domestic cotton manufacture to efforts in the same direction. As early as 1806, according to Mr. Samuel Batchelder, whose brief record of the "Cotton Manufacture in the United States" is our authority for many statements in these pages, T. M. Mussey, at Exeter, N. H., produced a loom capable of weaving, but possessing no claim as a labor-saving machine. About the same time a vertical loom was made at Dorchester, and Mr. Batchelder saw another in operation at Dedham, weaving about twenty yards of coarse cloth per day. Neither of these was, however, superior to the hand-loom in economical results.

The following memoranda of various attempts to weave by power in Rhode Island during the years of the war, when cotton manufacturing was making its first extraordinary advance in that State, have been furnished for this work by the Hon. Zachariah Allen, of Providence :

"In March, 1812, John Thorpe, of Providence, obtained a patent for a vertical power-loom, and put it in operation in the mill of Henry Franklin at Johnston. About the same time Samuel Blydenburgh made and put in operation at the Lyman Mill, in North Providence, twelve power-looms for weaving cotton cloth.

"Thomas R. Williams soon after (1813) followed, putting in operation several looms.

"Mr. Elijah Ormsbee constructed several power-looms near Providence in 1814.

"Mr. Silas Shepherd, of Taunton, states that he constructed an experimental power-loom in 1811, and, in the winter of 1812, commenced making them for sale in connection with John Thorpe.

"But all of these looms failed of successful operation on account of the imperfect system of dressing and beaming the warps, and also for want of a device to prevent the smashing the warp when the shuttle failed to go through the web to its place in the box.

"Mr. Francis C. Lowell introduced power-looms into the Waltham Mill, operated by a cam and weight to act on the lay to beat in the filling. This pattern of loom was copied from the work on weaving by John Duncan, Plate XIV. These looms were put in operation in 1814, and all the operations of making the yarn, dressing it, and weaving were performed in superior manner, taking precedence.

"The first cotton mill in which all parts of the manufacture were accomplished to delivery of the finished cloth, in Rhode Island, was in Olneyville, belonging to Henry Franklin and John Waterman.

"The first wide looms for weaving woollen broadcloth were put in operation in Allendale, North Providence, in the year 1826."

To two very progressive manufacturers, Mr. Francis C. Lowell of Boston, and Judge Lyman of Providence, the development of weaving by power was mainly due. Mr. Lowell visited Europe in 1810-11, and, if he did not see the Scotch loom in operation, was doubtless acquainted with its results and general principles. Returning to America, he organized the Boston Manufacturing Company in February, 1813, and late in the same year completed the erection at Waltham of a factory of seventeen hundred spindles. In 1814 he devised, constructed, and put in successful operation a power-loom differing essentially from the Scotch loom, but accompanied by the dressing machine of Horrocks, which Mr. Lowell had procured drawings of, and materially improved upon.

In the perfection of the Waltham loom, Mr. Batchelder remarks that application was made to Shepherd, of Taunton. Capt. Shepherd, one of the oldest manufacturers of cotton machinery in the country, was believed by David Anthony to have been the first who experimented upon the production of a power-loom.

The Waltham loom was a satisfactory success, and the mill in which it was operated was the first in the United States, and possibly in the world, conducting all the operations of converting the raw cotton into finished cloth. Lowell, who was as remarkable for his projecting and organizing capability as for his inventive genius, died in 1817 at the early age of forty-two. When Nathan Appleton and others of his associates in the Waltham enterprise, a few years after his death, were beginning on their land at East Chelmsford the immense industries which for many years constituted the largest cotton-manufacturing centre in America, they paid only a worthy tribute to his extraordinary merit in naming the future city Lowell.

Hardly more than a year (September, 1816) subsequent to the Waltham invention, the Scotch loom was introduced in this country by William Gilmore, a Scotch machinist, who was thoroughly acquainted with the original construction of Cartwright, and the various improvements which had rendered it a practical machine. Of Gilmore, Mr. Allen's memoranda says: "The principal great impulse given to power-loom weaving was accomplished by William Gilmore, who came from Scotland with the latest improved Scotch loom, warper, and dresser, in 1815. He built several looms at the Lyman factory in North Providence."

Gilmore's first communication with manufacturers in New England was at Slatersville with John Slater. Mr. Slater was in favor of accepting his proposition to construct the Scotch loom for his company, but, in the depression of business, his partners were averse to any new investment of

capital. At this time fortunately, Judge Lyman, who had employed Blydenburgh to put up several looms in his mill, which did not operate satisfactorily, heard of the foreign machinist, and at once employed him to build twelve machines. They were completed fully to the satisfaction of the patron, and successfully operated early in 1817.

This was the first introduction of the crank-loom in this country, the maker receiving fifteen hundred dollars for his services—a most inadequate recognition, if we consider the enormous benefits accruing to the industry from its results.

“Mule-spinning,” says Mr. Batchelder, “having been introduced in Rhode Island, the building of the power-loom by Gilmore completed the manufacturing system of that State within about three years from the time when the power-loom was put in operation at Waltham.

“It was not until ten years after the crank-loom had been in use in Rhode Island that it was adopted at Waltham or Lowell, and in neither place, nor in any of the mills that followed their system, was mule-spinning introduced until after 1830.”

The last important advance in mill machinery through the introduction of the self-acting mule of Sharp & Roberts will be noticed at length in the history of Fall River cotton manufacture.

With the completion of the processes of cloth-making, within the factory, by the introduction of the power-loom, the industry became permanently established in the United States. Notwithstanding the unstable policy of parties upon the question of tariffs and imports, the number of mills was constantly increasing, and, as they began to be built on a larger scale, the number of spindles was likewise even more largely extended.

From the statistics of cotton manufacturing embodied in the census of 1820 the following statement is extracted :

| STATES. | POUNDS OF COTTON ANNUALLY SPUN. | NUMBER OF SPINDLES. | STATES. | POUNDS OF COTTON ANNUALLY SPUN. | NUMBER OF SPINDLES. |
|--------------------|---------------------------------|---------------------|---------------------|---------------------------------|---------------------|
| Maine..... | 56,500 | 3,070 | Pennsylvania..... | 1,067,753 | 13,776 |
| New Hampshire..... | 412,100 | 13,012 | Delaware..... | 423,800 | 11,784 |
| Massachusetts..... | 1,611,796 | 30,304 | Maryland..... | 849,000 | 20,245 |
| Rhode Island..... | 1,914,220 | 63,372 | Virginia..... | 3,000 | |
| Connecticut..... | 897,335 | 29,826 | North Carolina..... | 18,000 | 288 |
| Vermont..... | 117,250 | 3,278 | South Carolina..... | 46,449 | 588 |
| New York..... | 1,412,495 | 33,160 | Kentucky..... | 360,951 | 8,097 |
| New Jersey..... | 648,600 | 18,124 | Ohio..... | 81,360 | 1,680 |

This estimate, showing a material falling off from the figures presented to Congress in 1815 by the Committee on Manufactures, was evidently

inadequate. In 1821, as will appear, the amount of cotton consumed in domestic manufacturing was 20,000,000 lbs.

In 1825, the number of spindles operated in the United States was estimated at 800,000, and the cotton worked up, 100,000 bales. The average price per pound was 11 cents. The average price of the prints of the Merrimac Company at Lowell was 25.07 cents per yard.

In 1826, quoting Bishop's *History of American Manufactures*, the number of distinct factory buildings in New England was estimated at 400, averaging 700 spindles each, or 280,000 in all. The new ones were very large, the old ones quite small. Each spindle was presumed to consume about one half a pound of cotton per day, or 140 pounds per annum, which, for 280 days' work, gave 39,200,000 pounds, or about 98,000 bales for the year's consumption. About one third of the buildings employed power-looms, one third hand-looms, and the others spun yarn and twist for the Middle and Western States. The factories were distributed about as follows: In Massachusetts, 135; Rhode Island, 110; Connecticut, 80; New Hampshire, 50; Maine, 15; Vermont, 10. The number of cotton factories in all the other States was estimated at 275, of the same average size, which would make the total annual consumption about 150,000 bales, or 60,000,000 pounds.

In 1831, in the midst of the heated controversy between not only parties, but individual thinkers, upon the proper and just tariff policy, a convention of prominent promoters of domestic industry was held in the city of New York on the 26th of October. This convention included over five hundred delegates from the Eastern and Middle States, Virginia, Maryland, and Ohio, and its discussion elicited correct and reliable statements of the condition and relative importance of "the various pursuits of domestic industry." The subjoined summary of the report of the Committee on Cotton Manufacture is copied from Mr. Bishop's History:

"From the best information that could be obtained, the Committee on Cotton, of which P. T. Jackson, of Massachusetts, was chairman, estimated the crop of the United States, after the year ending October 1, to be, in the Atlantic States, 486,103 bales of 306 pounds each, equal to 148,747,518 pounds, and in the Southern and Western States, 552,744 bales of 411 pounds, equivalent to 227,177,784 pounds, giving a total crop of 1,038,847 bales, or 375,925,302 pounds. The domestic consumption amounted to more than one fifth of the whole crop; and the value of the product, allowing it to be increased four-fold in the process of manufacture, probably four fifths that of the cotton crop, and equal to the value of the whole quantity exported.

"The following is a summary of the detail of the cotton manufacture in the twelve Eastern and Middle States, including Maryland and Virginia. But owing to misapprehension of the question respecting capital, only that employed in fixtures was returned, and some manufacturers were reluctant to give the details of their business, for which reasons it was thought that one fourth to one third might be safely added to the account. The statement was exclusive of no less than thirty establishments returned from the Southern and Western

States, from which no accurate details were received, and also of family manufactures. The cotton mills in the twelve numbered seven hundred and ninety-five.

| | Total in Cotton Mills. | Machine Shops. | Bleacheries. | Printeries. | Total. |
|---|------------------------|----------------|--------------|-------------|------------|
| Capital (principally in fixtures) in dollars..... | 40,614,984 | 2,400,000 | 900,000 | 1,000,000 | 44,914,934 |
| Spindles in operation..... | 1,246,503 | ..... | ..... | ..... | ..... |
| Yards of cloth made..... | 230,461,900 | ..... | ..... | ..... | ..... |
| Pounds of yarn sold..... | 10,642,000 | ..... | ..... | ..... | ..... |
| Pounds of cotton used (214,822 bales)..... | 77,757,316 | ..... | ..... | ..... | ..... |
| Hands employed (females, 38,927)..... | 62,157 | 3,200 | 738 | 1,505 | 67,600 |
| Pounds of starch used..... | 1,641,253 | ..... | 429,625 | ..... | 2,070,873 |
| Barrels of flour for sizing..... | 17,245 | ..... | ..... | 1,300 | 18,455 |
| Cords of wood..... | 46,519 | ..... | ..... | 30,000 | 76,519 |
| Tons of coal..... | 24,420 | ..... | 19,250 | 2,250 | 45,920 |
| Bushels of charcoal..... | 39,205 | ..... | ..... | ..... | ..... |
| Gallons of oil..... | 300,338 | ..... | ..... | 2,800 | 303,138 |
| Value of other articles in dollars..... | 599,223 | 1,960,212 | 276,625 | 935,585 | 3,766,285 |
| Spindles building..... | 172,024 | ..... | ..... | ..... | ..... |
| Hand weavers..... | 4,760 | ..... | ..... | ..... | ..... |
| Total dependents..... | 117,625 | 9,600 | 1,403 | 2,860 | 131,489 |
| Annual value in dollars..... | 26,000,000 | 3,500,000 | 1,036,760 | 1,500,000 | 32,036,760 |
| Aggregate wages..... | 10,294,944 | 1,248,000 | 209,814 | 402,965 | 12,155,723 |

From 1831 to 1836 a large increase of the capacity of distinct mills was observed, the new erections averaging from five to six thousand spindles. This enlargement of mill capacity continued with the growth of the industry, but is now believed to have reached its maximum.

It is unfortunately impossible to furnish an exact statement of the number of mills engaged in the various branches of cotton manufacture in the United States. In 1850 they numbered 1094, employing 92,286 hands, consuming 288,558,000 pounds of cotton, and realizing a product worth \$65,501,687 upon a capital invested of \$74,500,931. In 1860, there were 1091 mills of 5,235,727 spindles, employing 122,028 hands, consuming 422,704,975 pounds of cotton, producing \$115,681,744 of goods, on an invested capital of \$98,585,269. In 1870 the number of distinct producers had fallen off to 956; but this does not indicate a diminution in the industry, the estimate of spindles operated being 7,132,415; the hands employed, 135,369; cotton worked up, 409,899,746 pounds; capital invested \$140,706,291; and the value of product, \$177,489,739. The foregoing figures are taken from the census reports for the several decades. The report of the amount of cotton worked up in 1860 is obviously an error, and is more correctly estimated by Mr. Nourse at 364,036,123 pounds.

The subjoined summary of the strictly cloth-producing business of the country was made up in November, 1874, by the thorough statistician of the *New York Commercial and Financial Chronicle*, and its tables republished in 1875 as a correct exhibit of the industry.

STATEMENT OF THE NUMBER AND CAPACITY OF COTTON MILLS IN THE UNITED STATES AND THE CONSUMPTION OF COTTON FOR THE YEAR ENDING JULY 1, 1874.

| NORTHERN STATES. | No. of Mills. | No. of Looms. | No. of Spindles. | SOUTHERN STATES. | No. of Mills. | No. of Looms. | No. of Spindles. |
|--------------------|---------------|----------------|------------------|---------------------|---------------|---------------|------------------|
| Maine..... | 24 | 12,415 | 609,898 | Alabama..... | 16 | 1,360 | 57,594 |
| New Hampshire.. | 42 | 20,422 | 855,189 | Arkansas..... | 2 | 28 | 1,256 |
| Vermont..... | 10 | 1,274 | 58,948 | Georgia..... | 42 | 2,934 | 137,330 |
| Massachusetts..... | 194 | 71,202 | 3,769,292 | Kentucky..... | 4 | 42 | 10,500 |
| Rhode Island..... | 115 | 24,706 | 1,336,842 | Louisiana..... | 3 | 300 | 15,000 |
| Connecticut..... | 104 | 18,170 | 908,200 | Mississippi..... | 11 | 348 | 15,150 |
| New York..... | 55 | 12,476 | 580,917 | Missouri..... | 4 | 382 | 18,656 |
| New Jersey..... | 17 | 2,000 | 150,968 | North Carolina..... | 30 | 1,055 | 55,498 |
| Pennsylvania..... | 60 | 9,772 | 452,064 | South Carolina..... | 18 | 1,238 | 62,872 |
| Delaware..... | 8 | 796 | 47,976 | Tennessee..... | 42 | 1,014 | 42,058 |
| Maryland..... | 21 | 2,399 | 110,260 | Texas..... | 4 | 230 | 10,225 |
| Ohio..... | 5 | 236 | 20,410 | Virginia..... | 11 | 1,664 | 56,490 |
| Indiana..... | 4 | 618 | 22,988 | | | | |
| Minnesota..... | 1 | 24 | 3,400 | | | | |
| Total..... | 660 | 176,480 | 8,927,754 | Total..... | 187 | 10,495 | 487,639 |

RECAPITULATIONS.

| | No. of Mills. | No. of Looms. | No. of Spindles. | Average Size of Yarn. No. |
|-------------------------|---------------|----------------|------------------|---------------------------|
| Total Northern..... | 660 | 176,480 | 8,927,754 | 28.56 |
| Total Southern..... | 187 | 10,495 | 487,569 | 12.50 |
| Grand Total..... | 847 | 186,975 | 9,415,323 | 27.73 |

COTTON USED.

| | Lbs. | Bales. |
|----------------------|--------------------|------------------|
| Northern States..... | 507,790,099 | 1,094,387 |
| Southern States..... | 59,793,775 | 128,526 |
| Total..... | 567,583,873 | 1,222,913 |

We have seen that the number of spinning spindles in the United States on the 1st of July, 1874, was 9,415,383 against 7,114,000 at the same date of 1870, and 6,763,557 at the same date of 1869, as follows:

| | Looms. | Spindles. |
|------------------------|----------------|------------------|
| 1874. | | |
| North..... | 176,480 | 8,927,754 |
| South..... | 10,495 | 487,629 |
| Total 1874..... | 186,975 | 9,415,383 |
| 1870. | | |
| North..... | 147,682 | 6,851,779 |
| South..... | 5,852 | 262,221 |
| Total 1870..... | 153,534 | 7,114,000 |
| 1869. | | |
| North..... | | 6,538,494 |
| South..... | | 225,063 |
| Total 1869..... | | 6,763,527 |

The above records a very rapid progress since 1870, being about 33 per cent in the number of spinning spindles.

GOODS MANUFACTURED THIS YEAR.

No portion of our inquiry has been more difficult than the obtaining of statistics with regard to production, and no one, of the results reached, possesses more interest. The most notable feature is the enormous production of print cloths. It is to be regretted that we have no figures for previous years with which to make comparisons, or by which we could show the growth of this branch of manufacture, but it is well known they have increased rapidly of late years. Of course we do not claim that these results of quantities and kinds of goods are as exact as the returns of consumption; but we believe they are as close an approximation as the nature of the case will permit.

STATEMENT OF THE KINDS AND QUANTITIES OF COTTON GOODS MANUFACTURED IN THE UNITED STATES FOR THE YEAR ENDING JULY 1, 1874.

| | New England States. | Middle and Western States. | Total Northern States. | Total Southern States. | Total United States. |
|--|---------------------------|----------------------------------|------------------------------|------------------------------|----------------------------|
| Threads, yarns, and twines, lbs. | 32,000,000 | 99,000,000 | 131,000,000 | 18,000,000 | 149,000,000 |
| Sheetings, shirtings, and like plain goods, yards. | 520,000,000 | 90,000,000 | 610,000,000 | 97,000,000 | 707,000,000 |
| Twilled and fancy goods, Osnaburgs, jeans, etc., yards. | 204,000,000 | 80,000,000 | 284,000,000 | 22,000,000 | 306,000,000 |
| Print cloths, yards. | 481,000,000 | 107,000,000 | 588,000,000 | ..... | 588,000,000 |
| Gingham, yards. | 30,000,000 | 3,000,000 | 33,000,000 | ..... | 33,000,000 |
| Ducks, yards. | 14,000,000 | 16,000,000 | 30,000,000 | ..... | 30,000,000 |
| Bags, No. | 5,000,000 | 1,000,000 | 6,000,000 | ..... | 6,000,000 |

Besides the above, there is a large production of hosiery and knit goods, made of cotton by itself or mixed with wool, of which we are able to give no satisfactory statement. Another year we hope to push our investigations as to production in every direction.

The exportation of cotton cloth was an important feature in the commercial relations of the country at a comparatively early period of the industry. The goods first made at Waltham were heavy sheetings, of the kind which has since been the staple production, and under the name of "American domestics," won and retained the preference for excellence of quality in every market of the world. The superiority of this branch of American production was soon recognized by the British manufacturers, and the dangerous competition threatened therein was very seriously discussed by the commercial and practical writers of England. So great was the alarm of the cotton interest of Manchester, that it resorted not only to furtive attempts to create a public sentiment in this country antagonistic to protection, but adopted trade-marks, mill-tickets and stamps similar to the American, and in every possible way sought to imitate the production of the New England mills. So persistent was this effort, that in 1827 the demand for American domestics in Brazil was considerably affected by the competition of a lower grade of goods, pretending to be New England fabric, but made in Manchester, and offered at a less price. The efforts of Manchester to substitute its inferior cloth, though pursued with desperation of purpose, were, however, only

temporarily successful, the American exportation constantly increasing. Dr. Livingstone, who was in his youth a weaver, in his first published record of travel, speaks of finding in the hut of a negro king a piece of Manchester cloth labelled New York Mills—so wretched an imitation of the well-known fabric it claimed to be, that he seems to wonder at the attempted deception even in the wilds of Africa.

In 1835 the exportation had attained a really respectable position, promising, if continued, to consume a considerable proportion of the entire production. Of this period Mr. Bishop remarks :

“The quantity of cotton long cloths imported this year from the United States into China was 134,000 pieces, and of cotton domestics 32,743 pieces; while of cotton goods the whole importation into that country in British vessels was only 75,922 pieces. The importation of American piece goods was nearly double that of the previous year, amounting to 24,745 pieces. An extensive manufacturer of Glasgow, who had for several years supplied Chili with cotton domestics, spun and woven in his own works to the best advantage, had latterly been obliged to abandon the trade to American competition. At Manilla, 35,240 pieces of thirty-inch and 7000 pieces of twenty-eight-inch American gray cottons were received, and only 1832 pieces of Belfast manufacture. The ports of Rio de Janeiro, Aux Cayes, of Malta, Smyrna, and the Cape of Good Hope, were also overstocked with American unbleached cottons, to the exclusion of British goods, which they undersold.”

The terribly disastrous effects of the civil war, almost sweeping American commerce from the seas, at last gave to the British manufacturer the advantage he was unable to secure in a legitimate competition. Up to the appearance of rebel privateers upon the ocean, our domestic production in nearly every foreign market was preferred to the British, and in China had well-nigh driven it from the field. Mr. Eli T. Sheppard, United States Consul at Tien-tsin, the principal port of entry for cotton fabrics, in a communication to the State Department, October 10, 1872, in regard to the relative position of American and British stuffs, remarks as follows :

“The importation of American cotton manufactured goods into China is worthy of our most earnest consideration. Ever since the British plenipotentiary, who signed the treaty at Nankin in 1842, informed his countrymen that ‘he had opened up a country to their trade so vast that all the mills in Lancashire, by running night and day, could not make stocking-stuff enough for one of its provinces,’ the question of supplying China with manufactured cottons has been one of the most absorbing interest for the wisest statesmen and political economists of Great Britain.

“During the year 1861, before the civil war in America had seriously crippled our commerce and manufactures, 133,401 pieces of American drills and jeans were sold in Tien-tsin, netting in gold \$583,223. So great, indeed, had become the demand for American cotton fabrics, that the demand far exceeded the supply.

“Against the 133,401 pieces of American goods imported at Tien-tsin in

1861, the number of pieces of English drills imported was only 3599 pieces for the same period. In other words, the trade at this port in American cottons was, in round numbers, forty times that of English manufactured articles of a like character. During the war the imports of American cottons became merely nominal, while a corresponding increase of English fabrics supplied the market. From this I infer that there is no good reason why American manufactured cotton goods should not again resume their place in the markets of China.

“Cotton manufactures form at present the largest part of the direct trade between England and China, and Tien-tsin has already become the largest importer of these articles in the empire.”

In 1859 and 1860, preceding the war, there were severally shipped from the port of New York alone to China and the East Indies 53,662 and 47,735 packages. In 1861, the effect of the war not yet being seriously felt, the amount fell off to 31,911 packages. In 1862 to 1865 the exportation was entirely cut off, and the Chinese market virtually lost to American industry. Since the close of the internecine struggle, efforts have been made to re-establish the trade, the shipments from New York in 1866 being 6,972 packages; but it is a difficult undertaking to build again both trade and commerce.

Meanwhile the competitors of the United States in China, the English and Dutch manufacturers, had enjoyed the trade without even a contest; the former not only, in the forced absence of his old antagonist, still pursuing the dishonest practice of assuming his trade-marks, and using every means to counterfeit his production in appearance, but resorting to a fraudulent debasing of the fabric in both material and finish that has threatened to close the Eastern market to all European as well as American enterprise. This pernicious policy of the Manchester cotton interest was manifested to some degree in the early period of competition, English cloth having always discovered a proportion of foreign matter in its material when tested by washing. Within the present decade, the practice of introducing clay and other matter to increase the weight, and exaggerating the “sizing” far beyond the requisite degree needed to dress the warp properly, has, however, reached a point at which adulteration is a mild term to apply to it. The fraud had in 1873 become so flagrant as to force the British merchants in China to memorialize the Manchester Chamber of Commerce upon the subject, and the *London Times* to utter the protest of honest industry as follows:

“It seems a pity that the present exhibition was not made the opportunity of instructing the public in that dark chapter of the cotton manufacture known as the ‘sizing’ question, concerning which a memorial went up to the Government last year from the weavers of Todmorden, and has been

followed this year by a very clear and emphatic report from Dr. Buchanan, a Government officer commissioned to make inquiries. This matter of the 'sizing' of cotton lies in a nutshell, and we will state it shortly for the information of those who are not likely to see Dr. Buchanan's temperate but decided report. Up to twenty years ago fermented flour and tallow were used in the cotton manufacture to give tenacity to the warp and to lessen the friction in weaving. It was then found that the brown color imparted to the cloth by size made from cheap and bad flour could be corrected by china clay added to the size, and furthermore that this clay lessened the amount of tallow needed in the size. The clay came thus into use, and its use became still more general when the Russian war raised the price of tallow. Presently came the American war of secession, and the manufacturers were forced to put up with bad, short-fibred cotton, difficult to weave. It was then further found that a free use of size gave to poor sorts of cotton the needful tenacity of twist, and, weight for length being the test of good cloth, it was also evident that the more the size used the greater the weight. Thus very soon a practice crept in, and has now spread largely over the cotton trade, of unwarrantably loading cotton with quantities of size laid on to the warps to the extent of forty, sixty, and even, as the weavers assert, one hundred per cent of their original weight. This practice of deliberate adulteration has become in the cotton trade a recognized detail of manufacture; but, however it may be viewed by those interested in the practice, it must still seem a downright dishonesty to the outer world. But the dishonesty of this practice is not the worst part of it, for the weavers suffer far more than the public, being compelled to inhale the dust of the clay as it rises from the warps. The Government report shows this 'heavy sizing' process has thus converted weaving from a healthy into an unhealthy occupation; that it has made the weaving-room more dusty than the carding-room, and that it has sensibly increased among weavers in the clay-using mills lung diseases and the death-rate. It is intolerable that operatives should thus suffer because their employers choose to indulge in a questionable practice, and we trust that in the name of common humanity and commercial morality some speedy stop may be put to a state of things so deeply scandalous."

In March, 1874, Mr. Sheppard, the very intelligent representative of the United States at Tien-tsin, in his official report to the State Department, referred at length to the adulteration fraud, accompanying his document with copious extracts from the *North China Herald* and other public expressions, indicating the disgust of all European residents in the Celestial Kingdom:

"Although the raw material used in manufacturing these fabrics, consumed by China, is chiefly produced in the United States, yet American cotton must now pass through the looms of England and Holland before it can find a market in China. The superior quality of American cotton is well known to Chinese traders. Our cotton goods, by reason of their cheapness before the war, supplied the China markets to the exclusion of all others, and created

a demand that, since our war, has steadily increased to its present imposing magnitude. The superiority of our cotton still remains an enduring advantage possessed by American fabrics over all others; but this important advantage is now almost entirely neutralized by their high cost, as compared with those others.

“One material advantage reaped, and still enjoyed, by England from the civil war in the United States, was the monopoly of supplying China with manufactured cotton goods. Cheap labor was unquestionably the cause of this; but after the monopoly of this trade had been fully secured to England as a consequence of our war, English manufacturers did not rest satisfied with the single advantage sustaining their monopoly—cheap labor—but resorted to counterfeiting American trade-marks that had become popular among the Chinese. The end in view was duly attained, by successfully palming off inferior English cotton fabrics upon unsuspecting native merchants as American manufactures, and thus our share in this trade was still further effectually reduced to its present insignificant proportions. As might be expected, deception was not confined to counterfeiting trade-marks and the names of American mills; a wider field was opened for its practice, and the system of over-sizing or weighting the cotton goods with worthless substances, such as clay, etc., was commenced by English manufacturers shortly after our war, and has since developed into what it is at present—a gigantic fraud.

“By this practice cotton goods, which are sold by the piece, weighing a certain number of pounds, are so prepared by manufacturers as to reduce the proper amount of cotton from one third to one half; and this deficiency in weight is made up by worthless rubbish, which does not outlast the first washing to which the cloth is subjected by the native consumer, who is deceived in buying it.

“Although our interest in the trade is now so small, it is well to mention here that this fraudulent practice is receiving the countenance of American trade-marks, which are still extensively used by English manufacturers; and thus the injury which American trade at first suffered through counterfeiting is now aggravated by the further dishonesty of adulteration.

“It is a question whether this fraudulent practice of over-sizing would have occasioned so much outspoken condemnation among those who are interested in the English trade, excepting manufacturers, had it not been that an unlooked-for result of over-sizing—namely, mildew, made its appearance to such an extent that a large proportion of English cotton goods sent to China was, and is still, found to be unmerchantable as sound goods on reaching this country. Hence, over-sizing, or weighting, is now better and less offensively known as the ‘mildew question.’ The English manufacturers and merchants appear to have joined issue on this question. The merchants and their agents accuse the manufacturers of dishonesty, and the latter rejoin that merchants encourage and sustain the practice of weighting by buying goods so prepared in preference to honest goods. Meanwhile the trade continues, and weighting increases, and is likely to continue so long as the Chinese consumer is the chief sufferer.

“But the iniquities of the English trade in cotton goods are working its

FALL RIVER AND ITS INDUSTRIES.

| DESTINATION. | 1849. | 1850. | 1851. | 1852. | 1853. | 1854. | 1855. |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. |
| Central America..... | 354 | 607 | 1,218 | 653 | 713 | 43 | 495 |
| West Coast South America..... | 2,603 | 3,426 | 1,395 | 2,743 | 1,642 | 809 | 1,152 |
| Honduras..... | 859 | 101 | 150 | 246 | 179 | 276 | 401 |
| Africa..... | 475 | 538 | 1,772 | 3,405 | 1,239 | 1,007 | 1,324 |
| Australia..... | ..... | ..... | ..... | ..... | 200 | 529 | 1,908 |
| East Indies and China..... | 13,143 | 20,091 | 27,902 | 38,413 | 18,889 | 12,436 | 11,929 |
| All others..... | 231 | 130 | 31 | 25 | 82 | 550 | 251 |
| Total packages shipped from New York.. | 24,006 | 32,155 | 40,560 | 54,692 | 34,828 | 24,280 | 27,585 |
| Add packages shipped from Boston to all ports. | 41,344 | 34,307 | 46,589 | 59,395 | 54,729 | 35,428 | 34,093 |
| Total packages from both ports..... | 65,350 | 66,462 | 87,149 | 113,987 | 89,557 | 59,708 | 61,678 |

| DESTINATION. | 1856. | 1857. | 1858. | 1859. | 1860. | 1861. | 1862. |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. |
| Mexico..... | 4,897 | 2,084 | 2,446 | 2,475 | 4,873 | 2,766 | 2,427 |
| Dutch West Indies..... | 151 | 581 | 317 | 531 | 664 | 569 | 84 |
| Swedish West Indies..... | 10 | ..... | 4 | ..... | 47 | 38 | ..... |
| Danish West Indies..... | 427 | 564 | 691 | 696 | 952 | 522 | 316 |
| British West Indies..... | 880 | 207 | 219 | 227 | 497 | 537 | 165 |
| Spanish West Indies..... | 151 | 223 | 358 | 366 | 193 | 374 | 140 |
| St. Domingo..... | 228 | 591 | 262 | 977 | 2,169 | 1,257 | 484 |
| British North America..... | 25 | 42 | 14 | 18 | 10 | 60 | 23 |
| New Granada..... | 949 | 560 | 627 | 967 | 1,381 | 2,005 | 609 |
| Brazil..... | 3,756 | 2,751 | 4,466 | 3,637 | 8,103 | 5,400 | 953 |
| Venezuela..... | 335 | 268 | 523 | 919 | 1,328 | 1,421 | 141 |
| Argentine Republic..... | 590 | 90 | 328 | 903 | 1,111 | 430 | 145 |
| Cisplatine Republic..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Central America..... | 190 | 101 | 200 | 55 | 53 | 23 | 1 |
| West Coast South America..... | 158 | 3,710 | 4,195 | 6,606 | 13,291 | 5,299 | 1 |
| Honduras..... | 160 | 170 | 436 | 259 | 389 | 245 | 12 |
| Africa..... | 1,874 | 1,414 | 1,200 | 323 | 1,406 | 876 | 49 |
| Australia..... | 2,060 | 418 | 109 | 135 | 323 | 180 | 3 |
| East Indies and China..... | 17,674 | 12,676 | 43,419 | 53,662 | 47,735 | 31,911 | 187 |
| All others..... | 267 | 203 | 180 | 1,793 | 1,793 | 1,823 | 47 |
| Total packages shipped from New York.. | 34,782 | 26,653 | 59,994 | 74,549 | 86,318 | 55,736 | 5,787 |
| Add packages shipped from Boston to all ports..... | 37,880 | 26,000 | 29,875 | 31,661 | 33,588 | 18,146 | 4,238 |
| Total packages from both ports..... | 72,662 | 52,653 | 89,869 | 106,210 | 119,906 | 73,882 | 10,025 |

| DESTINATION. | 1863. | 1864. | 1865. | 1866. | 1867. | 1868. | 1869. |
|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. |
| Mexico..... | 1,886 | 849 | 112 | 282 | 1,090 | 1,837 | 1,496 |
| Dutch West Indies..... | 9 | 3 | ..... | 42 | 133 | 157 | 310 |
| Swedish West Indies..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Danish West Indies..... | 29 | 1 | 8 | 16 | 33 | 87 | 170 |
| British West Indies..... | 149 | 24 | 9 | 58 | 254 | 399 | 335 |
| Spanish West Indies..... | 66 | 86 | 30 | 22 | 292 | 140 | 273 |
| St. Domingo..... | 63 | 12 | ..... | 9 | 244 | 69 | 138 |
| British North America..... | 16 | ..... | ..... | 3 | ..... | 14 | 30 |
| New Granada..... | 356 | 83 | 11 | 423 | 575 | 253 | 1,083 |
| Brazil..... | 86 | 4 | ..... | 261 | 2,343 | 1,716 | 1,494 |

| DESTINATION. | 1863. | 1864. | 1865. | 1866. | 1867. | 1868. | 1869. |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. |
| Venezuela..... | 32 | 9 | 4 | 35 | 116 | 303 | 84 |
| Argentine Republic..... | 13 | 2 | 17 | 77 | 551 | 529 | 1,377 |
| Cisplatine Republic..... | 19 | 8 | 3 | 59 | 399 | 121 | 247 |
| Central America..... | 1 | 6 | ..... | ..... | 3 | 3 | 49 |
| West Coast South America..... | ..... | 2 | ..... | 293 | 1,024 | 207 | 667 |
| Honduras..... | 5 | 4 | ..... | 5 | 47 | 121 | 38 |
| Africa..... | 11 | 24 | ..... | 807 | 2,016 | 2,700 | 2,255 |
| Australia..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| East Indies and China..... | 5 | 7 | ..... | 6,972 | 4,558 | 15,677 | 10,471 |
| All others..... | 30 | 8 | ..... | 52 | 197 | 1,715 | 485 |
| Total packages shipped from New York.. | 2,776 | 1,132 | 194 | 9,416 | 13,875 | 26,048 | 21,047 |
| Add packages shipped from Boston to all ports..... | 421 | 264 | 308 | 6,802 | 9,031 | 11,422 | 7,185 |
| Total packages from both ports..... | 3,197 | 1,396 | 502 | 16,218 | 22,906 | 37,470 | 28,232 |

| DESTINATION. | 1870. | 1871. | 1872. | 1873. | 1874. | 1875. | 1876. |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. | Packages. |
| Mexico..... | 680 | 1,948 | 1,593 | 1,402 | 1,529 | 1,230 | 1,035 |
| Dutch West Indies..... | 270 | 339 | 329 | 330 | 318 | 194 | 95 |
| Swedish West Indies..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Danish West Indies..... | 285 | 139 | 281 | 161 | 139 | 178 | 194 |
| British West Indies..... | 261 | 241 | 348 | 323 | 438 | 329 | 723 |
| Spanish West Indies..... | 543 | 731 | 646 | 610 | 409 | 328 | 780 |
| St. Domingo..... | 1,698 | 829 | 625 | 1,376 | 1,123 | 2,867 | 1,927 |
| British North America..... | 48 | 43 | 32 | 93 | 81 | 664 | 825 |
| New Granada..... | 1,139 | 1,464 | 785 | 643 | 1,012 | 1,224 | 4,156 |
| Brazil..... | 1,712 | 2,431 | 2,886 | 2,879 | 3,699 | 5,320 | 4,831 |
| Venezuela..... | 164 | 381 | 458 | 252 | 708 | 1,276 | 1,880 |
| Argentine Republic..... | 617 | 85 | 472 | 1,194 | 285 | 1,000 | 523 |
| Cisplatine Republic..... | 256 | 317 | 255 | 745 | 671 | 73 | 505 |
| Central America..... | 54 | 4 | 44 | 252 | 148 | 77 | 310 |
| West Coast South America..... | 624 | 387 | 336 | 972 | ..... | 990 | 425 |
| Honduras..... | 39 | 81 | 164 | 136 | 195 | 298 | 607 |
| Africa..... | 1,927 | 1,524 | 1,583 | 1,024 | 1,049 | 2,614 | 2,757 |
| Australia..... | ..... | ..... | ..... | ..... | ..... | ..... | 68 |
| East Indies and China..... | 3,174 | 5,488 | 1,798 | 2,302 | 6,349 | 10,017 | 13,415 |
| All others..... | 1,051 | 583 | 510 | 2,382 | 4,704 | 8,886 | 27,172 |
| Total packages shipped from New York.. | 14,482 | 17,049 | 13,045 | 17,281 | 23,047 | 37,574 | 63,828 |
| Add packages shipped from Boston to all ports..... | 7,550 | 11,157 | 4,889 | 7,442 | 13,876 | 16,935 | 24,392 |
| Total packages from both ports..... | 22,032 | 28,206 | 17,934 | 24,723 | 36,923 | 54,509 | 87,220 |

The cotton manufacture of Europe and America at the close of 1874 is shown in the subjoined table :

| | No. of Spindles. | Pounds per Spindle. | Total Pounds. | Bales of 400 Pounds. | Average per Week. |
|------------------------|------------------|---------------------|---------------|----------------------|-------------------|
| England..... | 37,515,000 | 32 | 259,836,000 | 3,149,590 | 60,569 |
| United States..... | 9,415,383 | 65 | 522,378,200 | 1,305,943 | 25,114 |
| Russia and Poland..... | 2,500,000 | 60 | 150,000,000 | 375,000 | 7,212 |
| Sweden and Norway..... | 305,000 | 65 | 19,825,000 | 49,562 | 913 |
| Germany..... | 4,650,000 | 55 | 255,750,000 | 639,375 | 12,296 |
| Austria..... | 1,555,000 | 67 | 104,185,000 | 260,463 | 5,009 |

| | No. of Spindles. | Pounds per Spindle. | Total Pounds. | Bales of 400 Pounds. | Average per Week. |
|------------------|------------------|---------------------|---------------|----------------------|-------------------|
| Switzerland..... | 1,850,000 | 25 | 46,250,000 | 115,625 | 2,223 |
| Holland..... | 230,000 | 60 | 13,800,000 | 34,500 | 663 |
| Belgium..... | 800,000 | 50 | 40,000,000 | 100,000 | 1,923 |
| France..... | 5,000,000 | 42 | 210,000,000 | 525,000 | 10,096 |
| Spain..... | 1,750,000 | 46 | 80,500,000 | 201,250 | 3,870 |
| Italy..... | 800,000 | 56 | 44,800,000 | 112,000 | 2,154 |
| Totals..... | 66,370,383 | .. | 1,747,324,200 | 6,868,308 | 142,042 |

The four principal centres of the manufacture are in Massachusetts and New Hampshire. The first factory was started in Fall River in 1813. At Amoskeag Falls, New Hampshire, a mill was operated in 1804, but the large enterprise of Manchester dates from 1831. The first cotton mill in Lowell, then East Chelmsford, was established in 1822, and the first in Lawrence in 1849. Fall River is at present, and promises to continue to be, the chief seat of the manufacture in the United States.

In 1837 the Secretary of State of Massachusetts was instructed by a concurrent vote of the Legislature to prepare a statistical exhibit of the several conspicuous industries of the Commonwealth. The following statement of the cotton manufacture, tabulated by counties, was embodied in his report :

| COUNTIES. | No. of Mills. | No. of Spindles. | Pounds of Cotton consumed Y'rlly. | Yards of Cloth man'fd Yearly. | Value of Cotton Goods man'fd Y'rlly. | Males em-ploy'd | F'mles em-ploy'd | Capital invested in the Cotton mnrfr |
|-------------------|---------------|------------------|-----------------------------------|-------------------------------|--------------------------------------|-----------------|------------------|--------------------------------------|
| | | | | | Dollars. | | | Dollars. |
| Suffolk..... | .. | ..... | ..... | ..... | ..... | .. | .. | ..... |
| Essex..... | 7 | 13,300 | 804,222 | 2,301,520 | 372,972 | 115 | 402 | 337,500 |
| Middlesex..... | 34 | 165,868 | 17,696,245 | 52,860,194 | 5,971,172 | 1054 | 6435 | 6,909,000 |
| Worcester..... | 74 | 124,720 | 5,292,018 | 20,280,312 | 1,991,024 | 1384 | 1998 | 2,015,100 |
| Hampshire..... | 6 | 8,312 | 563,000 | 1,574,000 | 176,060 | 72 | 233 | 216,000 |
| Hampden..... | 20 | 66,552 | 4,727,302 | 15,107,583 | 1,504,896 | 626 | 1886 | 1,698,500 |
| Franklin..... | 4 | 5,924 | 135,045 | 1,081,140 | 76,125 | 48 | 140 | 90,000 |
| Berkshire..... | 31 | 35,260 | 1,390,162 | 7,530,667 | 575,087 | 339 | 766 | 633,725 |
| Norfolk..... | 32 | 25,782 | 1,365,953 | 4,953,816 | 509,383 | 280 | 583 | 609,500 |
| Bristol..... | 57 | 104,507 | 4,814,238 | 18,382,828 | 1,678,226 | 987 | 2015 | 1,622,778 |
| Plymouth..... | 15 | 13,298 | 480,884 | 2,052,061 | 182,474 | 85 | 279 | 230,616 |
| Barnstable..... | 2 | 1,508 | 6,848 | 195,100 | 19,240 | 7 | 20 | 7,000 |
| Dukes County..... | .. | ..... | ..... | ..... | ..... | .. | .. | ..... |
| Nantucket..... | .. | ..... | ..... | ..... | ..... | .. | .. | ..... |
| Total..... | 282 | 565,031 | 37,275,917 | 126,319,221 | 13,056,659 | 4997 | 14,757 | 14,369,719 |

In comparison with the figures of this report of the cotton manufacture of Massachusetts in 1837, Fall River makes the following exhibit in 1876 :

| No. of Mills. | No. of Spindles. | Pounds of Cotton Consumed Annually. | Yards of Cloth Manufactured. | Employés. | Capital Invested. |
|---------------|------------------|-------------------------------------|------------------------------|-----------|-------------------|
| 33 | 1,258,508 | 58,050,000 | 340,000,000 | 14,000 | \$30,000,000 |

The extraordinary development of Fall River has been effected by several causes. Baines attributed the origin and growth of Manchester to the fortunate location of the place in the centre of a district rich in "water-

power, fuel, and iron," possessing "ready communication with the sea by means of its well-situated port, Liverpool," and early enjoying the "acquired advantage of a canal communication." These tributary circumstances are generally wanting in the case of Fall River, which possesses neither iron nor fuel in close proximity to its demands, and reaps no appreciable advantage from its water beyond its use in the engine-rooms and the bleaching processes. Yet in several respects the location of the city is favorable to the prosecution of its great industry. Its relation to the sea, more immediate than that of its great rival, is a positive aid, the depth of water at its wharves admitting the loading and discharging not only of coasting craft, but of large ships. Thus the coal absolutely necessary for the fuel of the mill engines, and the iron worked up in its machine shops and foundries, are conveyed from the mines, in most cases, entirely by water carriage, reducing the cost of freightage to the *minimum* figure, and giving the hive of industry on Mount Hope Bay a superiority over manufacturing towns situated inland and obtaining their supplies by railroad.

In the relation of Fall River to the sea exists likewise a circumstance favorably affecting the manufacture of cotton. One of the traditional claims of England to an advantage over other countries in this pursuit has been its "sea-girt" position, which assures a constant humidity, that is an essential, in a greater or less degree, in all the stages of cloth production. Of course, the atmosphere of the region in and about Fall River has far from the same degree of moisture that is permanent in England, and a still less constituent proportion than that of the Irish coast, exposed immediately to the dense fogs of the Gulf Stream, and especially created (if we may credit the superstition of the Belfast people) by a beneficent Providence for the fabrication of linen; yet, with its slight remove from the ocean, whose moist breath is softened by its passage up the inland estuary, while the English air carries the extreme of humidity to the spinning and weaving processes, that of the great American manufacturing district probably enjoys the really proper mean of temperature. In this connection an extract from recent statements of the Coast Survey officials regarding the relative temperatures of New England localities is of interest: "Locally there are some important modifications of this general character, chief of which is the softening of the extremes of heat and cold on the islands and coasts of the south-east, Nantucket, Barnstable, and Bristol counties. The well-known mildness of Newport continues all along the coast, and the difference" (between it and the extreme cold of interior Massachusetts) "in winter is very marked. The Gulf Stream comes near enough to be sensibly felt, in addition to the general modifications" (of the inland rule of extreme heat or cold) "caused by the extension, as it may be called, of these districts into the sea. Though storms are very violent off

Cape Cod, and the long circuit southward of Nantucket, the temperature is still so much modified as to be 7° warmer for the mean of the winter months at Nantucket than at Cambridge, and nearly 5° warmer at New Bedford, Williamstown" (Berkshire County) "is 7° colder than New Bedford for the average of the winter months."

It will be remembered that New Bedford and Fall River are closely contiguous points, bearing about the same relation to the sea.

The internal administration of a Fall River industry is not essentially different from that in other advanced centres of cotton manufacturing, treasurers, agents, and superintendents of mills exercising the duties conventionally attaching to those offices. But, unlike other centres, the treasurers are invariably residents, and generally the subordinate offices are filled by persons immediately interested in the business. The stockholders likewise are, in a much greater proportion than governs elsewhere, "native there, and to the manner born." This is a very great, indeed, an almost incalculable factor in the general development. Absenteeism, the curse of most large congregations of industry, is unknown and, happily, unfelt in its baleful influences. The community itself, in its integral construction and outward manifestation, is one of active, interested workers, the owners and projectors breathing the same atmosphere with the operatives, who, in their turn, under such a system, may also become, by diligence and temperance, owners and projectors. From this condition of the community results the intensely practical spirit that pervades and controls the place, and assures conservatism of management and wise husbandry of resources through the control and under the watchfulness of a universal intelligence. Too much importance can not be ascribed to this most fortunate sympathy of the social and economical constituents of any population; but its largest uses and richest results are manifested in the great cotton-manufacturing centres.

To the conservatism and practical nature of the people of Fall River is due the fact that the history of the place shows so insignificant a number of industrial disappointments. In 1871-2, when mills were springing up in number like a forest, the business world was dazed by the extraordinary spectacle, and wiseacres, who did not know its people, began to mutter, "Fall River is mad, downright crazy." The event has not, however, justified the censures of the cynics or the croakings of the seers. On the contrary, the statisticians have discovered that the number of spindles added to the productive force was demanded by the development of trade, and that what appeared to be the inspiration of an inflated unreason was really the movement of a calm and intelligent calculation. Speculative ideas and business charlatany, so far from being encouraged, are not even entertained by these practical

schemers, and the result is that no place in New England, within our ken, has so very small a grave-yard of deceased enterprises, great expectations that have died of slow consumption or sudden collapse.

What the future has in store for Fall River, if we study simply its past, need not be answered indefinitely. To-day not a spindle in its mills, nor a granite block in their walls, is weighted with a mortgage. It is the first city in the extent of its cotton manufacture in the United States, and second only to Manchester in the world. Its resources are within its own community, and the market for its production is the whole globe. So long as the same conservative enterprise, honest purpose, and harmony of effort, which have established its fortunes, are the distinctive qualities of its people, it will continue to be, as it now is, the finest monument of American industry.

PROGRESS OF INVENTIONS IN COTTON MACHINERY.

Anno Domini.

- 1765. Fly Shuttle (John Kay) and Drop Box (Robert Kay).
- 1767. Spinning Jenny—Patented in 1770—Hargraves.
- 1769. Spinning Frame—Arkwright. Wyatt's Patent was in 1738, but was not put into practical operation.
- 1775. Mule—Jenny and Frame combined—Crompton.
- 1785. Power Loom—brought into general use in 1820—Cartwright.
- 1792. Cotton Gin—Whitney. American.
- 1797. Cards—Whittemore. American.
- 1797. Reeds—Wilkinson. American.
- 1807. Steam Engine—Wyatt and Fulton. American.