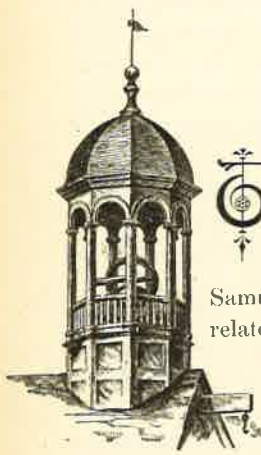


COTTON IN RHODE ISLAND.

DEVELOPMENT OF THE INDUSTRY FROM INSIGNIFICANT BEGINNINGS—NATURAL ADVANTAGES FOR MANUFACTURING IN THE RIVER VALLEYS—ACCOUNTS OF SOME OF THE EARLY MILLS AND MANUFACTURERS.



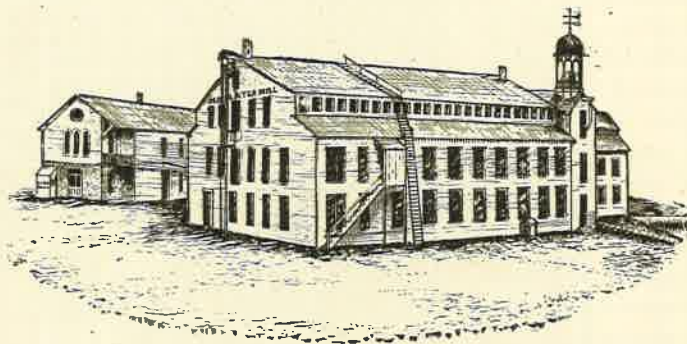
THE origin of the cotton manufacture in Rhode Island under the guidance and direction of Samuel Slater, has already been related at length in the columns of this journal. The development of the business that followed has not, however, been treated, and as that is an extremely interesting subject an endeavor has been made in the following pages to set forth the struggles and successes of the first manufacturers, and to present a brief view of the history of the industry in the State.

When Mr. Slater had succeeded in getting the preparatory machinery and the first water frame in America in operation on the 20th of December, 1790, it is hardly probable that either he or his associates realized the importance of the event—that it was the birth of one of the greatest of industries, and that the consequences in the creation of wealth and the effect on social and political conditions would be so far reaching and of such great moment. Yet, as a direct consequence, towns and villages quickly sprang up in what had formerly been uninhabited places, wealth was rapidly created, and an impetus was given to the development of the state that no natural advantages it possessed would have ever rendered possible without the Arkwright inventions.

The first building where the machinery constructed by Slater was operated does not now exist, having been carried away by a freshet in 1807. It was situated at the southwest end of the bridge at Pawtucket Falls. Previous to 1790 it had been used as

a fulling mill, and was provided with a water wheel, which was used to run the "water frame" and the other machinery. For twenty months the business was carried on in this building, at the end of which time so much yarn had been spun that no market could be found for it. This overproduction is not at all surprising when the fact is taken into consideration that all the yarn had to be woven on hand-loom of comparatively primitive construction, and the further fact is noted that previous to this time there had been no cotton warp produced, so that the weavers were unaccustomed to its use, were consequently somewhat prejudiced against it, and time was required to make its value evident.

Although this first mill was producing more yarn than the business seemed to warrant, yet Slater and his partners had so much confidence in the future of the industry that they determined to build a factory specially designed for the manufacture, and in which they could carry on all the requisite operation



THE OLD SLATER MILL.

under one roof. Beside the preparatory processes and the spinning of the yarn, they found it necessary to have conveniences for dyeing, singeing and calendering, and these operations they conducted in separate buildings. The new mill started July 12, 1793, and was the first complete spinning factory in America. All the associated processes were conducted under its roof. These processes in after years were developed into separate branches—bleaching and dyeing being the principal ones—and gave employment to great establishments. As is well known this pioneer factory now stands in Pawtucket, and is known as the "Old Slater Mill." It has since been enlarged, both in height and length, but the original timbers and frame still form a large part of the present structure. It was in this mill, in the year 1794, that the first cotton sewing thread was manufactured. The story goes that the credit of the discovery is due to Mrs. Samuel Slater. She had noticed the beauty and evenness of the yarn made from some Sea Island cotton, and sug-

gested to her husband that it could be made into a good sewing thread. Mr. Slater tried the experiment, and succeeded in making a fine strong thread. From that time on he continued the manufacture, and Pawtucket probably owing to this early start, has always been a centre of the thread business.

The fine strong even yarn made by Slater in the Old Mill rapidly created for itself a market. Before the starting of the new machinery in 1790 all the cotton yarn that had been used in domestic manufacture was for the weft or filling, the warp being of linen. While waiting for the new machinery to be perfected Almy & Brown had in the cellars of private houses spinning jennies at work making cotton yarn, which was woven into various fabrics with linen warps. During the year 1790 they in this way manufactured 326 pieces, containing 7,823 yards of velvets, velvetens, corduroys, thicksets, denims, velures, stockinets, fustians, etc. These goods were woven principally by

Scotch and Irish weavers. The Arkwright machinery, however, made not only yarn suitable for filling, but also good yarn for warps. As already stated, the rapidity of production soon overstocked the market, but this in time was overcome as gradually better methods came into use, and the firm of Almy, Brown & Slater developed an excellent business in supplying weavers and families from all over Rhode Island and the adjoining sections of Massachusetts with warp and filling yarns.

Before Slater began the construction of the machinery he entered into an agreement, April, 1790, with William Almy and Smith Brown, who constituted the firm of Almy & Brown, that he was to have a half interest in the business. The new firm thus formed was styled Almy, Brown & Slater, and continued in the business for about forty years.

Following in the footsteps of the great pioneer in the cotton manufacture, Richard Arkwright, who was as remarkable for the

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another, and the making of the cloth proceeds regularly, adding one hair at each revolution of the loom shaft, or about fifty hairs per minute to the fabric.

Thus this novel industry was established, and hundreds of these looms now working successfully in Pawtucket, Rhode Island, and in various parts of Europe, attest the skill of the inventor and the forecast of his friends. The wild horses of Siberia contribute their help to this business. From them fully two-thirds of the hair required for the fabric is obtained. It is marketed indeed at the two great Russian fairs; at Irbit in winter, and Nishni Novgorod in summer. Most of the other third is got in South America. A

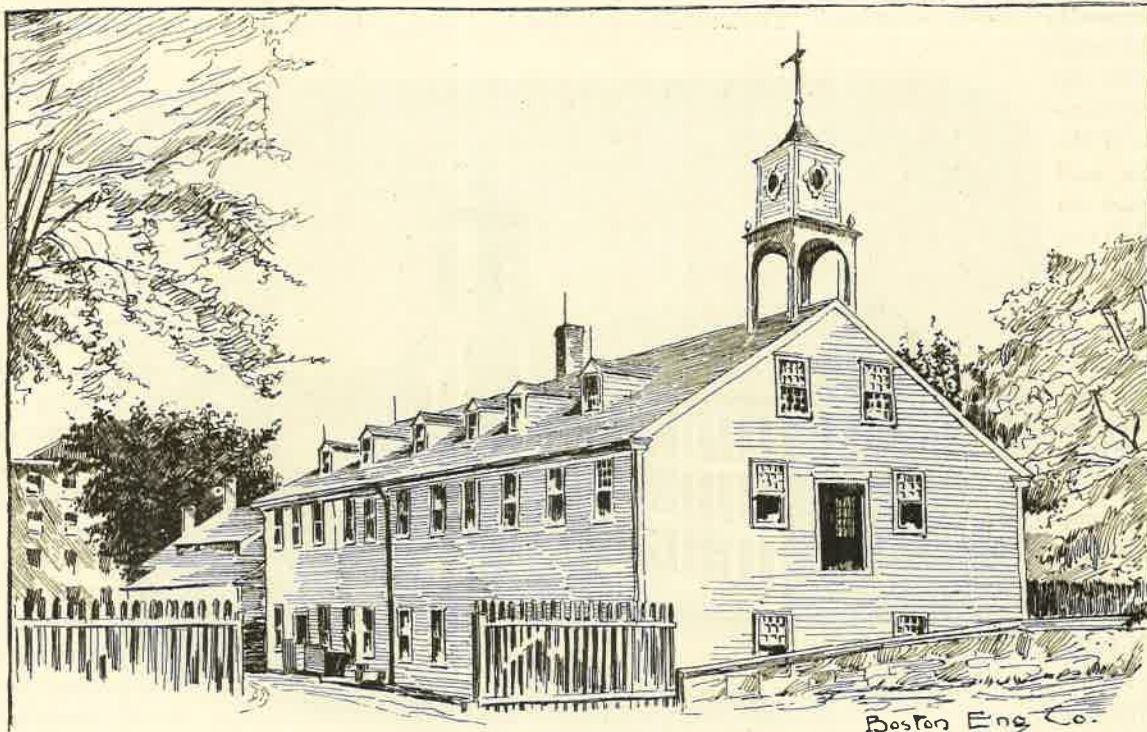
and William Wilkinson, also sons-in-law of Oziel, he formed the firm of Samuel Slater & Co., in which, as in the other case, he held a half interest. The building of a mill on the east side of the river, then in Massachusetts, was immediately begun, but it was not completed until 1801. This was the first spinning mill in Massachusetts and the second in Pawtucket, and probably the second really successful factory in America. Mr. Slater was superintendent of the old mill and of this new one, and for his personal services received one dollar and fifty cents a day for each mill, making his wages \$3.00.

LEARNING THE BUSINESS.

These mills were a school for many young

industry of cotton spinning began to develop on all sides. Soon after the building of the New or White Mill, for it was known by both names, by Samuel Slater & Co., some of the workmen became dissatisfied, and decided to leave and start a factory on their own account. They accordingly went to Cumberland, and erected a small mill, which in turn was the nucleus from which other enterprises started.

In 1794 a cotton mill was built at Centerville, in Warwick, by a company composed of Job Greene, William Potter, John Allen, James Ferris and James Greene. Owing probably to the fact that the machinery was imperfect or that the managers lacked ex-



Old Mill at Slatersville, 1806-7.

million horses or more annually furnish their tail hair for the making of hair cloth, and their manes for our mattresses and stuffed furniture whereon we rest, or to which we resort to find "tired nature's sweet restorer, balmy sleep."

Is it strange, then, that all love the horse so dearly? D. G. L.

Cotton in Rhode Island.

(Continued from page 20.)

number, extent, and variety of the enterprises he engaged in as he was for his inventive genius, Mr. Slater decided to engage in manufacturing with other partners while still retaining his interest with Almy & Brown. Accordingly, in 1798, with Oziel Wilkinson, his father-in-law, Timothy Green

men. Other mechanics had constructed spinning machines and erected factories, but no one had succeeded in perfecting the machinery and conducting the manufacture so successfully as had Mr. Slater. In fact all the cotton factories built in Rhode Island and adjoining regions from 1791 to 1809 were erected under the direction of Mr. Slater or of men who had learned how to build and operate machinery under his direction. Many of these attempts were failures, especially those made in the first few years after the starting of the Old Mill, and the chief reason for this lack of success was, doubtless, the inexperience of the projectors. But as the years rolled around, the youths who had gained experience in the two mills at Pawtucket started out for themselves, and the in-

experience, the undertaking was not a success and in 1799 a half interest in the property was purchased by William Almy and Obediah Brown for the sum of \$2,500. Under their management the business was established on a paying basis, and in 1801 the entire property was purchased by Almy & Brown.

Owing to the causes already mentioned, namely, the lack of experience except among those who had been educated in the mills at Pawtucket, and the fact that the natural demand for yarn was extremely limited at first, the development of the business in the state was very slow. In the History of American Manufacturers, by J. L. Bishop, it is said that the whole number of cotton mills in

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The Fletcher Manufacturing Company.

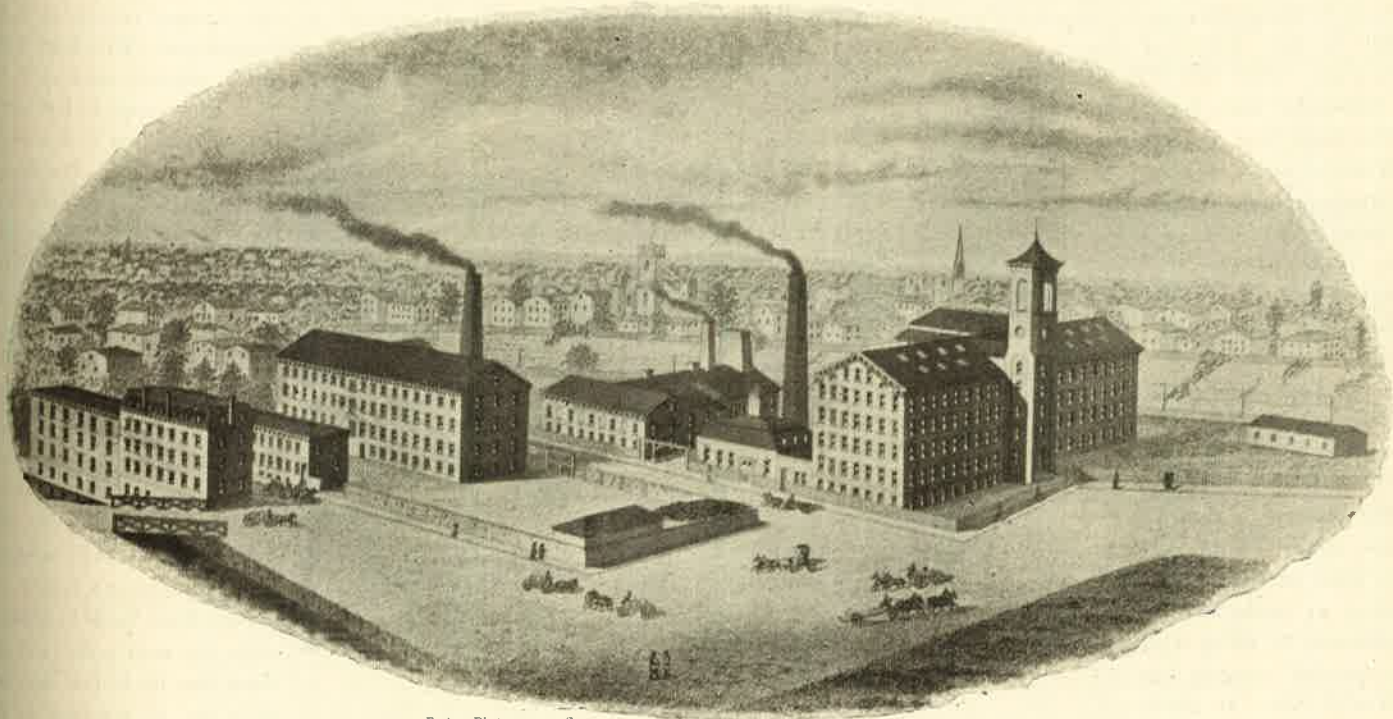
ONE of the oldest enterprises in the city of Providence was started in Boston, Mass., by Thomas Fletcher, in 1793, a cotton weaver, of Manchester, England, who came to this country in 1791. He had been early taught in the art of weaving narrow goods, such as tapes, lamp wicks, fringes, and similar wares.

Securing a supply of cotton yarn, he commenced the weaving of these goods in a small room on Cornhill, Boston. Soon after the Argand lamp was introduced into this country from France. Mr. Fletcher at once saw that there would soon be a demand for wicks suited to these lamps and he soon after commenced the manufacture of them and was

Fletcher Brothers, Mr. Joseph Fletcher being admitted. In 1840 they removed the mill on Charles street where they could obtain water-power. This mill was known as the "Town Grist Mill." There they operated 300 spindles and spun their own yarn. In 1844 they purchased the land on Charles street and erected their first mill. In 1860 they admitted to the firm John S. Ormsbee, William B., son of William Fletcher, Henry, son of Joseph Fletcher, and Samuel G. Trippe. The firm name was changed to Fletcher Brothers and Company. In 1865 the company was incorporated with a paid up capital of \$300,000, with officers as follows: Thomas Fletcher, President; William Fletcher, Vice-President; John S. Ormsbee,

served his country with honor during the War of the Rebellion, and attained the rank of Brigadier-General of Volunteers. On returning from the field he was appointed Collector of Internal Revenue for the State of Rhode Island. Joseph Fletcher died April 10, 1885. William B. Fletcher was elected President and John S. Ormsbee, Vice-President.

The Fletcher Manufacturing Company ranks with the largest and soundest in the country. They are known for their honorable and liberal dealings. They employ nearly one thousand hands, and their building covers four acres of ground. While the goods they manufacture are termed "small wares," they are known and sold all over the United States, and the name of the



Boston Photogravure Co.

The Fletcher Manufacturing Company's Plant.

able to meet the demand that he anticipated.

In 1808 Mr. Fletcher removed his business to Providence where he established his works on South Main street, near the Providence Institution for Savings, removing to a house on Charles street in 1809. From Charles street he removed in 1820 to the corner of Davis and Cross streets, where he remained until his death, which occurred in 1824. Mr. Fletcher left three sons, Thomas, William, and Joseph, who were well qualified to carry on the business. Thomas and William Fletcher formed a partnership, and with the assistance of their brother Joseph, they carried on a very successful business. In 1826 they commenced the manufacture of boot, shoe, and corset laces.

In 1837 the firm name was changed to

Treasurer; Henry Fletcher, Secretary and Agent.

The discovery of petroleum and the manufacture and extensive use of kerosene oil caused a great demand for lamp wicks, so that to-day they are manufacturing and selling more goods than any other concern in the United States. Thomas Fletcher, the President of the company, died in 1867, and was succeeded in office by William Fletcher, with Joseph Fletcher as Vice-President. William Fletcher died in 1860 and was succeeded by Joseph Fletcher as President. William B. Fletcher was elected Vice-President. Henry Fletcher, who served as Secretary and Agent, died May 6, 1875. Mr. William Ames was elected to fill the vacancy caused by the death of the Secretary and Agent. Mr. Ames

Fletcher Manufacturing Company is as familiar as "household words."

The officers of the company to-day are: William B. Fletcher, President; William Ames, Secretary and Treasurer. Selling Agents—William B. Fletcher, New York; S. G. Trippe, Boston, Mass.

Cotton in Rhode Island.

(Continued from page 22.)

the United States in 1803 was only four. Probably this statement means that only that number of those in existence were successfully using the Arkwright machinery and doing a paying business. These four mills were probably the two at Pawtucket, the mill at Centreville, and the one in Cumberland. From this period, however, factories

were rapidly established on the streams in various parts of the state, and the business began to grow greatly in importance.

FIRST INCREASE OF THE INDUSTRY.

From 1803 to 1807 ten cotton factories were erected in various parts of Rhode Island. At the close of 1807 there were fifteen mills in the United States, thirteen of them being in Rhode Island, one in Connecticut, and one in Massachusetts. The latter, however, was the mill of Samuel Slater & Co., in Pawtucket, on the east side of the river. In 1808, on account of the interruption of foreign trade, caused by the troubles that preceded the war of 1812, capital was directed to manufacturing, and many small establishments for cotton spinning were started in Rhode Island, the greater part of them in the immediate neighborhood of Pawtucket in the valley of the Blackstone, while the bulk of the remainder were located on the Pawtuxet river, in the towns of Warwick and Coventry. In the whole country, at the end of the year 1809, according to returns made to Mr. Gallatin, Secretary of the Treasury, eighty-seven mills had been erected, sixty-two of which were in operation, and the other twenty-five were expected to be in operation in the course of the year 1810.

The business continued to increase steadily until in 1811 there were in Rhode Island, according to Stone's census of Providence, 37 mills, with 32,786 spindles running out of a total of 56,259. In 1812 Pawtucket is said by one account to have had 24 factories with more than 20,000 spindles. Benedict's History of Rhode Island says that in 1809 "there were 17 cotton mills in operation within the town of Providence and its vicinity working 14,196 spindles." In 1812 there were said to be within 30 miles of Providence, in Rhode Island, 33 factories with 30,660 spindles; and in Massachusetts, 20 factories with 17,370 spindles, making 53 factories running 48,030 spindles. There are some discrepancies in these figures which could probably be explained by a thorough investigation. Very likely a few small establishments are counted in some instances and omitted in others; and then again probably the mills in Pawtucket on the Massachusetts side are counted into Rhode Island's quota in some of the estimates. These discrepancies, however, are no greater

than those that occur at present, as the census bureaus both State and national within the past decade have found it impossible to obtain exact returns of the Rhode Island mills.

The war of 1812 by almost completely stopping importation stimulated the growth of the cotton manufacture enormously. In 1815, after peace had been declared, the number of factories in Rhode Island was reported to be 99, with 68,142 spindles, nearly two-thirds of the entire number in the country. The average capacity of mills at that period was only 500 spindles. The Old Mill at Pawtucket up to this time was the largest in the country, as in it 5,170 spindles were operated.

INTRODUCTION OF THE POWER LOOM.

Although the spinning of cotton had thus

was familiar with the loom as originally constructed by Cartwright and with all the subsequent inventions and improvements, and was provided with patterns of the perfected loom and dresser as used in Scotland. John Slater invited Gilmore to Slatersville, and wished to engage him to construct the Scotch loom, but the other partners, owing to the depression in business then existing, were opposed to the experiment. Mr. Gilmore remained at Slatersville for some time and worked in the mill as a machinist. Judge Lyman, of North Providence, who had for several years been experimenting with power looms heard of Gilmore, and engaged him to build looms and dressers. Twelve looms were built, the maker receiving for his services \$1,500, and were put in operation early in 1817 in the Lyman factory at North Providence. This loom was a

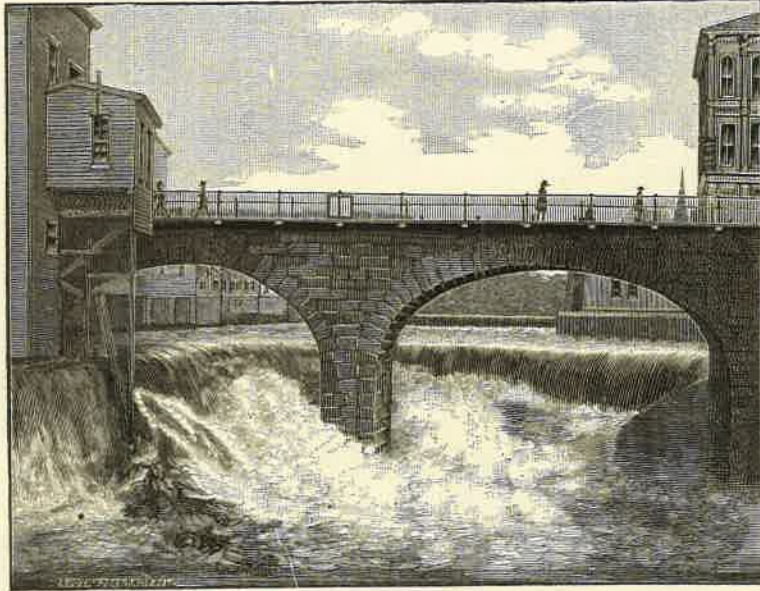
much superior machine to the loom which was put into operation at Waltham by Francis C. Lowell in 1817. The Scotch loom soon supplanted the Waltham machine, and has been the model on which the common cotton looms of to-day are constructed.

Thus again Rhode Island led in the introduction of fundamental improvements in cotton machinery, for although power looms had been in operation elsewhere previous to the construction of the twelve machines for Judge Lyman's factory, yet the machines made by Gilmore were the most perfect and efficient that up to that time had been put in operation in the country, and this model supplanted all others in a few years.

CONTINUED INCREASE.

A strong impetus was given to the cotton industry by the introduction of the power loom. The existing factories added looms to their plants, thereby doing away with the necessity of finding weavers among the rural population to work up the yarn into cloth at their homes. As a consequence, although the number of establishments did not increase, they enlarged their capacity, in some instances nearly double. In 1823 the number of factories in the vicinity of Providence and adjacent parts of Connecticut and Massachusetts was estimated at one hundred. "Among the largest were the establishments of Almy, Brown & Slaters, at Slatersville, and that of the Blackstone Manufacturing

(Continued on page 26.)



Pawtucket Falls, 1890.

developed into a very important industry, the market for the yarn was limited by the fact that the demand was only equal to the power of the clumsy hand-loom to weave it into cloth. Rumors of the power-loom invented in England by Rev. Edmund Cartwright in 1785, of the improvements made in the loom by Horrock in 1803 and in subsequent years, and of the dressing machine invented by Radcliffe and Johnson, which made the loom effective, had reached the United States; but the same jealousy on the part of the British authorities that had prevented Samuel Slater from carrying plans of the Arkwright spinning machinery out of the kingdom, prevented models of the improved power-looms being brought to this country before 1814. In that year, although some accounts say not until 1816, a Scotch mechanic named William Gilmore landed in Boston. He

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(continued on page 26.)

The Corliss Steam Engine Works.

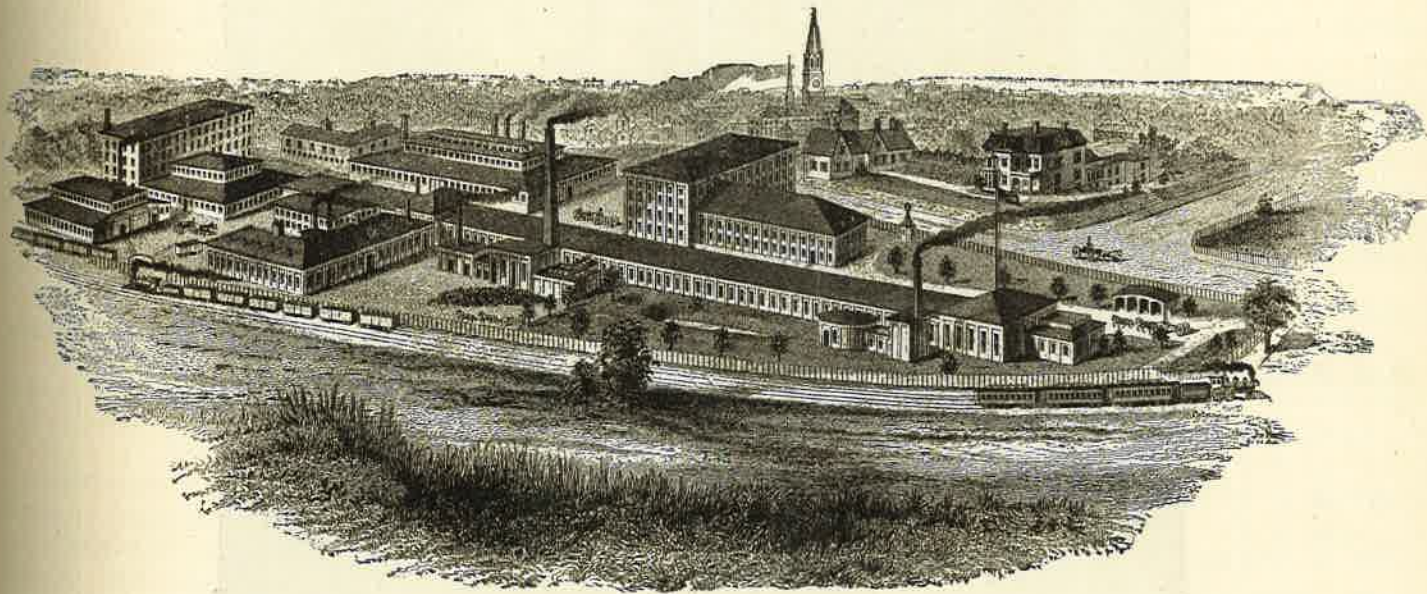
In 1849 the Corliss Steam Engine Com-
pany was founded in Providence by George
H. Corliss and was incorporated in June,
1856, with a capital of \$300,000, and from
that time has held the distinction of being the
most celebrated steam engine works in the
world. Mr. Corliss invented the famous
"Corliss Engine" and it was to develop
and build this engine in all its perfection that
these works were established by him. The
plant of the company is at the junction of
Charles and Cross streets and covers nine
acres of land; the buildings being of brick,
lighted by gas and heated by steam. The
entire place is a model for neatness and con-
venience, and being on the line of the Old
Colony and N. Y. P. & B. railroads, branch
tracks render the receiving and shipping

to eight tons are placed and not taken out
until finished, ready for assembling. All of
these special machines, as well as others in
the various departments, were designed by
Mr. Corliss and built here at large expense.

Owing to the natural contour of the land
the foundry is admirably located. The street
approach, the pig iron and coal yard and the
cupola charging floor are all on a common
level, and the sand, clay and charcoal bins
are filled from this same level. The foundry,
lighted by electricity, is 235x130 feet, with
monitor roof, which receives its central sup-
port from four swing cranes of 40 tons
capacity each. There are three McKenzie
cupolas which are supplied with blast
through an underground brick conduit from
a pair of blowing engines located 350 feet
distant. These blowing engines are regulated
from the cupolas and were specially designed

directly from the erecting floor. Next to this
is machine shop No. 2, 150x50 feet, and
four stories high. Here all the lighter parts
are made and it is equipped with the finest
tools besides a number of special machines.
Among these are machines for finishing the
sheet steel casing which has been adopted
instead of the usual black walnut logging, in
connection with the latest improved steam
jacketed cylinder, machines for boring
vacuum and water pots, for finishing cylinder
bonnets, regulator work, heavy gang drill for
finishing wrought-iron steam and exhaust
arms.

The boiler shop is thoroughly equipped
for making steam boilers, the specialty being
the Corliss Patent Vertical Tubular Water-
Leg Boiler, patented only a few years ago.
This has found great favor in connection
with compound and triple expansion engines,



Boston Photogravure Co.

The Corliss Steam Engine Company's Plant.

of heavy castings and machinery very
easy. The largest building, machine shop
No. 1, is 608x70 feet, and one story
high. The tools in this shop are for heavy
machine work in connection with the manu-
facture of steam engines. The largest lathe
in it turns and finishes pulleys 30 feet in
diameter by 114 inches width of face, and
among the planers is one with a capacity for
taking in a piece of work 10x10x25 feet,
while another will plane a piece seven feet
square and fifty-five feet long. Some very
heavy special machine tools have been put in
this shop in order not only to reduce the cost
of manufacture but that the system of inter-
changeability of parts and consequent accu-
racy might be carried out in the most ponder-
ous castings. In bed milling machines
the rough bed castings weighing from one

and constructed at the works. The foundry
is well supplied with ovens and a large brass
foundry is located under the same roof. The
work of cleaning and rattling all castings is
performed in a building 135x120 feet, and a
new building annexed to this has special
machines for rattling and washing out the
cores from steam jacketed cylinders; and in
addition there are several large cast-iron
surface plates for accurately laying out the
working lines on these cylinders before they
are sent to the machine shop. The erecting
shop is 130x112 feet, finely lighted, with
monitor roof. A portion of the floor consists
of a cast-iron plate 80x10 feet, made in sec-
tions, accurately planed and set perfectly
level for the lining up of engines, especially
of the compound tandem type. Tracks run
into this shop and shipments by rail are made

where high pressure is required and highly
superheated steam is a valued desideratum.
The upright boiler has been manufactured
here for thirty years, and some of those first
set up are now in active service. A heavy
punch, a flanging machine for boiler heads,
and a hydraulic riveter are among the promi-
nent additions to this department. All
classes of forgings, both large and small,
which enter into the construction of steam
engines, are turned out in the forge-shop, it
being admirably adapted for this work. The
main shafts, connecting rods, piston rods,
etc., are all made from "horse shoe" scrap
iron, carefully reworked under the hammer.
This shop is 230 x 62 feet, like the other
buildings, of brick. It has a Sellers steam
hammer, with special steam crane, having a
capacity to forge a shaft twenty-two inches

in diameter by twenty-seven feet long; two Dudgeon hammers, one heavy enough to turn out a twelve-inch shaft; one Ferris & Miles hammer, and one Merrill; two drop hammers, cutting-off shears, etc. The pattern shop, lumber room, store room, drafting room, etc., are in a large four-story building a little apart from the rest.

The Corliss engines are built of different

Cotton in Rhode Island.

(Continued from page 24.)

Company, at Mendon, Mass.; the former having 116 and the latter 150 power looms with 6,000 spindles each, with bleach and dye house, and other collateral works; and the Coventry Manufacturing Company, with 4,000 spindles and 72 power looms, machine shop, saw and grist-mill, etc."

production per spindle was very limited. After the introduction of the power loom the factories were made very much larger, and after 1830 four, five and six thousand spindles began to be the average capacity of mills. The cost of constructing a mill in 1826 was calculated to be about \$14 per spindle and the consumption of cotton per spindle at that time was 140 pounds per annum.



Boston Photographic Co.

MOSES BROWN.

styles, *i. e.*, condensing, non-condensing, single or in pairs, compound and triple expansion, in sizes from fifty to 2,000 horse-power. They are in general and successful use for manufacturing and electric lighting and all other purposes requiring close regulation and economy in fuel.

In the year 1829 there were in Rhode Island 139 factories, of which the towns of Warwick and Smithfield each had twenty. The remainder were probably chiefly located in the Blackstone Valley. The average number of spindles to a mill previous to 1820 was less than 1,000, and at the same time the

From 1830 there has been such a great increase in the cotton manufacture in the State that it would be impossible to enter into a narration of the details of the developments in the limited space that can be devoted to the subject in these columns.

(Continued on page 28.)



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Cotton in Rhode Island.

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While the number of spindles and looms increased constantly the number of mills decreased, the explanation of this fact being that the new mills erected were much larger and were able to carry on business to so much better advantage as to render the smaller mills unprofitable. Down even to the present this same principle has operated, and in various parts of Rhode Island there can be seen to-day disused factories that in the early years of the century would have been considered mammoth concerns, but which have been forced out of business by the competition of larger mills with improved machinery. In 1831 Rhode Island had 116 mills with 235,753 spindles and 5,753 looms, and employing 8,500 persons; in 1850 there were 158 mills, employing 10,875 persons; in 1860, 153 mills operating 814,554 spindles and 17,315 looms; in 1870, 139 mills with 1,043,242 spindles and 18,075 looms; in 1880, 115 mills with 1,764,569 spindles and 29,669 looms. The consumption of cotton in 1831 was 10,411,578 pounds, while 81,139,172 pounds were worked up in 1880.

A considerable increase has taken place in the manufacture since 1880. Many of the old factories have been enlarged, and new ones built. The Rhode Island statistics are not as complete on these points as are those of some other cotton centres, but general observation shows that after a period of depression, evidenced by idle factories at Bristol, Newport, East Greenwich, and elsewhere, there has been a decided revival within the past few years. This new life has been manifested by such improvements as have been made by B. B. & R. Knight in their mills at Natick and River Point, and by the erection by the Lonsdale Company of the new Ann and Hope mill at Lonsdale.

In 1888 returns were made to the State Census Bureau from 91 establishments engaged in cotton manufacture in the State. At the same time there were known to be 132 concerns engaged in the business, so that consequently the totals presented by the census in that year were probably less by at least one fourth than the real facts. The figures from these 91 establishments were: Capital invested, \$22,576,789; raw materials used, \$7,665,679; persons employed, 19,393; wages paid, \$5,669,559; value of product, \$17,146,343. The actual capital invested is probably considerably over \$30,000,000, giving employment to 25,000 people, whose wages will aggregate over \$7,000,000.

WHERE THE MILLS ARE SITUATED.

More than one-half of the cotton man-

ufacture in Rhode Island is carried on in the Blackstone valley. Pawtucket is first with over a score of establishments, some of which include several mammoth mills. Then follow in quick succession Central Falls, Valley Falls, Lonsdale, Berkeley, Ashton, Albion, and Manville, each place with at least one finely equipped mill, and several with three or four. Next on the stream comes Woonsocket, which approaches closely to Pawtucket in the number of cotton spindles operated. This portion of the valley of the Blackstone, ten miles in length, ranks third in the list of cotton manufacturing centres in the United States, Fall River and Lowell being respectively first and second. But there is no reason why this section should not take the lead. The natural advantages are great, there being an abundance of good water and many available sites for new factories. When the railroad improvements now in progress at Providence are completed, both in the approaches to the city and in the lines reaching tide water, the availability of the Blackstone valley as a place for manufacturing will be enormously increased. It is not at all improbable that the future will see the chief centre of the cotton industry here, and this result would be fitting and appropriate, as the industry would be only coming back to its original home and birthplace.

The next most important cotton manufacturing locality in the State is the Pawtuxet valley. The river is dotted for a score of miles with villages and factories. At its mouth, in the village of Pawtuxet, there was formerly a small mill which was bought by the city of Providence at the time of the introduction of Pawtuxet water. The next place on the river is Bellefonte, then comes Hill's Grove, which, however, is some distance from the stream. Pontiac is the first place where the water power is made use of. Next comes Natick with its five mills and high stone dam. Just below River Point, two miles beyond Natick, the two branches of the river unite. On the southwest branch are River Point, Arctic, Centreville, Crompton, Quidnick, Anthony, Washington, and Coventry Centre. On the northwest branch are Clyde Print Works, Lippitt, Phenix, Harrisville, Arkwright, Fiskeville, Jackson, and Hope. Many years ago storage reservoirs were constructed on both branches to save the surplus water so that it could be used in the summer to run the mills, but the more general application of steam power has rendered this precaution of less value in recent times. The liability of being without water, however, operated against the

Pawtuxet as compared with the Blackstone valley, but under the new conditions the advantages of this region as a place for manufacturing are equally as good as any other locality in the State.

The Pocasset river, a small stream which empties into the Pawtuxet some distance above Pontiac, has been the scene of a number of important manufacturing enterprises. At Simmonsville the Hon. James F. Simmons, one of the ablest men Rhode Island ever produced, operated factories containing 8,000 spindles and 200 looms. At present the place is known as Thornton, and here are the British Hosiery works and several other establishments. The Cranston Paper Works are also located on the Pocasset river.

The Woonasquatucket valley, while not so busy a region as either the Blackstone or the Pawtuxet valley, has yet a considerable amount of cotton manufacturing, and since the opening of the Providence and Springfield Railroad in 1873 has had fair transportation facilities. The villages along the river are Olneyville, Merino, Dyerville, Mantua, Lymansville, Allendale, Centredale, Grandville, Allenville, Georgiaville, Harrisville, Pascoag, and some smaller places.

Although the smallest of the streams entering tide water at or near Providence, the Moshassuck has furnished water and motive power in the past to some of the most important industries in the state. The lower portion of this river in the limits of Providence was made use of for the channel of the Blackstone Canal which was opened July 1, 1828. At the lowest water privilege where in the early days of the history of Providence the "town grist mill" had stood the Fletcher Brothers located their boot, shoe and corset lace and lamp-wick factories in 1840, and there the business has developed to immense proportions, since then under the name of the Fletcher Manufacturing Company. The founder of this great business was Thomas Fletcher, an English weaver who came to this country in 1793 and established himself in Boston in the business of weaving lamp wicks and similar goods. In 1808 he removed to Providence on account of the advantage of securing cotton yarn he needed from the new spinning mills that had been erected. Other important manufacturing establishments in the Moshassuck valley are the Allen Paper Works, Silver Spring Bleachery, W. F. F. C. Sayles' Bleachery at Saylesville, which on its branch, West river, are situated in villages of Wanskuck and Geneva, in the northern suburbs of Providence.

(Continued on page 30.)

the "State

The first cotton mill built in Pawtucket in the rear of the city was visited by the author last week of the reception. The "State" in this article, although the "Father of American Industry" are a much more numerous as they can yield more than the modern mills have turned out in number, and the Main streets, in the lapse of one hundred

in that city engaged in cotton cloth. A cannot fail to produce of the BOARD OF THE old mill workshop, but in 1866 converted into a cotton 50 feet wide, 2 1/2 60x40 feet, two The steam plant located in the yards contains seven horizontal of the Robinson, one of the Sullivan's centennial boiler horse. The work power. The old

The "Slater Mills" in Pawtucket.

The first cotton mill which Samuel Slater built in Pawtucket, in 1793, is still standing in the rear of North Main street, and was visited by thousands of people during the week of the recent Cotton Centenary celebration. The "Slater Mills," referred to in this article, although named in honor of the "Father of American Cotton Manufactures," are a much more extensive concern, inasmuch as they can yield in one hour more of product than the modest plant of Samuel Slater have turned out in two years. They are two in number, and are situated on Church and Main streets, in Pawtucket, and after the lapse of one hundred years are the only mills

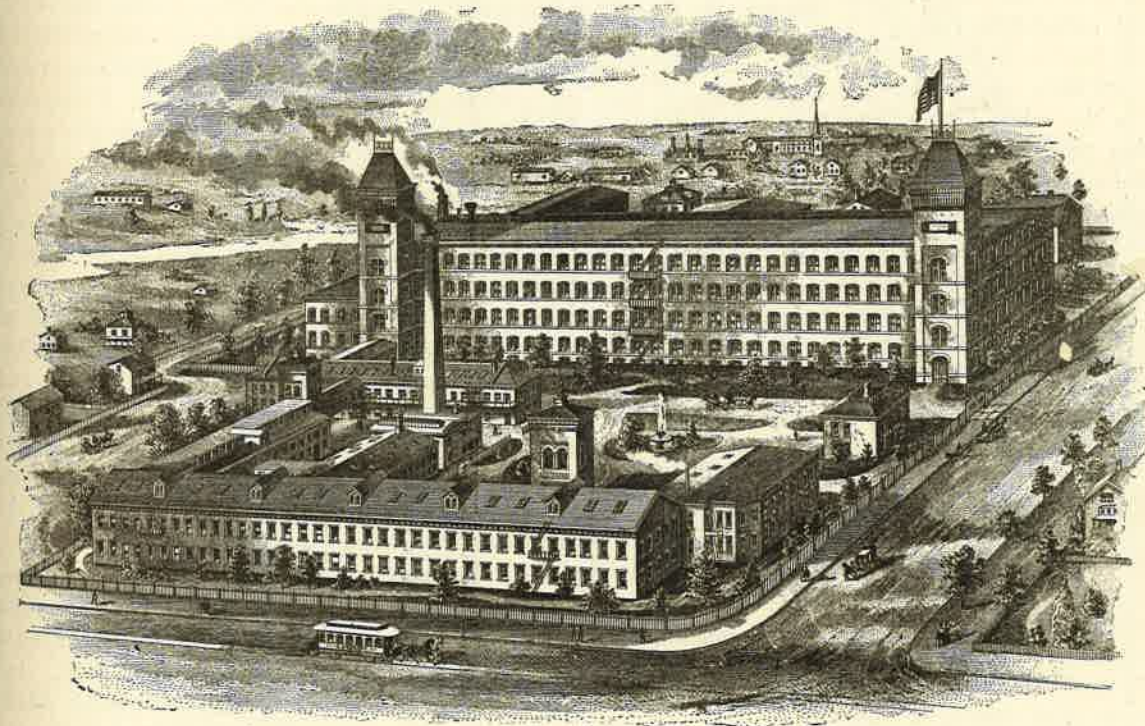
of 450-horse power. The carding department has 96 Whitin cards 36 inches wide, 1 doubler, 4 railway heads, 2 sets of drawings, 2 slubbers, 13 intermediates and 20 finespeeders. The spinning department has 8,256 ring frame spindles. In this room there are also 5 warpers and 6 spoolers. The mule department contains 7,572 spindles. The mules are of the James Brown make, of Pawtucket. In the weaving department there are 460 looms from 40 to 50 inches wide.

The new mill is a handsome, high-studded, well-ventilated brick building. It is 302 feet long, with engine and picker rooms on the end, which are 40 feet long, making the entire length 342 feet by 90 feet wide and five stories high. It is well lighted with many

that are used for both mills, ten warpers, twelve spoolers and two twisters. The weaving room has the aerophor ventilation and air moistening system.

The goods made at the "Slater Mills" are pronounced to be the best of their kind in the country. They are principally "Pride of the West" muslins, used for shirtings and for ladies' and children's wear, twills and satteens, nainsooks, and fancy lenos. The company also manufacture fine cotton yarns from carded and combed stock, cops, warp, filling or hosiery, and yarns in skeins, chains or beamed, dressed and undressed.

The steam used at the new mill is taken from the boiler room in the old mill yard and carried across the street, a distance of over



The Slater Mills.

in that city engaged in the manufacture of cotton cloth. A description of these mills cannot fail to prove interesting to the readers of the BOARD OF TRADE JOURNAL.

The old mill was formerly used as a file shop, but in 1869 it was enlarged and converted into a cotton mill. It is 300 feet by 50 feet wide, 2½ stories, and has two wings 60x40 feet, two stories high, built of brick. The steam plant for both the mills is located in the yard of the old mill. It contains seven horizontal tubular boilers, three of the Robinson, three of the Whittier and one of the Sullivan make, and five upright Corliss centennial boilers. The power is 1,200-horse. The works are run entirely by steam power. The old mill has a Corliss engine

large double windows, and has three large towers, two in front and one at the rear.

The picking department for both mills is in the new mill and consists of 2 openers, 4 intermediate and 5 finisher pickers, 144 Whitin 36-inch and 15 English 40-inch cards, 8 Whitin railway heads, 20 Curtis & Sons' combers, English and American systems of drawings, some of the frames having the electric stop motion; 5 slubbers, 16 intermediates and 30 fine speeders.

The ring frame spinning department contains 16,800 spindles. The mule room has 19,344 spindles. In the weaving room there are 890 Colvin 40 and 44-inch looms, and arrangements are being made to put in many more. There are also three slashers

100 feet, through a 12-inch pipe to the engine. The engine is a horizontal Harris-Corliss machine of 700-horse power.

The new mill is lighted by the Edison incandescent electric light system, and the old mill by the Westinghouse arc system. Each of the mills has a large cotton shed, capable of holding 2,000 bales of cotton. Automatic sprinklers are placed in each mill, and the establishment has good water service to be used in case of fire. All the buildings are well supplied with fire escapes. The ventilation in the new mill is first-class, and the sanitary conditions are excellent.

The production of the establishment approximates 110,000 pieces of goods yearly, at a valuation of over \$500,000. Seventy-

compared with the Blackstone under the new conditions the this region as a place for are equally as good as any the State.

river, a small stream which the Pawtuxet some distance has been the scene of a numerous manufacturing enterprises. The Hon. James F. Simons, the ablest men Rhode Island operated factories containing and 200 looms. At present known as Thornton, and here Hosiery works and several plants. The Cranston Print located on the Pocasset river. Pawtucket valley, while not as as either the Blackstone or valley, has yet a considerable on manufacturing, and since the Providence and Spring- in 1873 has had fair transpor-

The villages along the river Merino, Dyerville, Manton, Allendale, Centredale, Graniteville, Geogiaville, Harrisville, some smaller places.

The smallest of the streams enter at or near Providence, the is furnished water and motive east to some of the most industries in the state. The lower river in the limits of Providence use of for the channel of the Canal which was opened. At the lowest water privilege, early days of the history of "town grist mill" had stood, Brothers located their boot, lace and lamp-wick factory where the business has developed proportions, since 1865 of the Fletcher Manufactur-

The founder of this great Thomas Fletcher, an English came to this country in 1793 himself in Boston in the making lamp wicks and similar in 18 he removed to Providence the advantage of securing the needed from the new spinning been erected. Other manufacturing establishments in the valley are the Allen Print Spring Bleachery, W. F. & Bleachery at Saylesville, while West river, are situated the Pawtucket and Geneva, in the of Providence.

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five bales of long staple, the very best cotton grown, are used weekly, and 5,000 tons of coal are consumed yearly.

The company pays weekly out of consideration for their help. No assignments of wages are received at the mill. The weekly pay roll is about \$4,000. Six hundred hands are employed.

Crawford E. Lindsey, Esq., ex-mayor of Fall River, is Agent and Treasurer, and Hon. William F. Sayles, President of the company. Mr. Lindsey is also Treasurer of the Conanicut Mills at Fall River. The capital stock of the Slater Company is \$600,000, and dividends are declared semi-annually.

Cotton in Rhode Island.

(Continued from page 28.)

In the southern part of the state the Pawcatuck is the only considerable river, and its waters began to furnish motive power for cotton factories very soon after the business had been begun in the other river valleys. The manufacturing villages on this stream are Westerly, White Rock, Ashaway, Carolina Mills, Shannock, and on its tributary, Wood river, are Hope Valley, Wyoming and Arcadia. The two most important of these places are Westerly and Hope Valley, at each of which are several manufactories of various kinds.

While the cotton manufacturing of the State is chiefly located principally in the river valleys there are many important establishments on smaller streams. Among these may be mentioned those at Bristol, Warren, East Greenwich, Lafayette, Wickford, etc.

From this brief summary of the location of the cotton manufacturing establishments in Rhode Island it is evident that there is still plenty of room for growth. The sites available for mills are as plentiful as in the early days of the industry, for while at that time only those were selected that were contiguous to a water power, to-day nearly any place along the banks of the rivers could be utilized since the motive power would be furnished by steam or electricity, and the water supply is abundant for all other necessary purposes. The transportation facilities afforded by the railroads which run parallel with every stream, is a further great advantage. If it is true, as Edward Atkinson thinks, that the natural centre of the cotton manufacture is around Narragansett Bay and the southern coast of New England, there is no reason why Rhode Island with the advantages just mentioned should not outstrip other manufacturing centres in this great line of business. This result will only be prevented or delayed by old fogyism, apathy, or mismanagement,

THE FIRST FACTORIES.

A great amount of painstaking research would be necessary to find out and relate the history of all the early mills and the new villages they were the occasions of starting into life in all parts of Rhode Island. As a means of developing the facts that constitute the real basis of the history of Rhode Island within the present century, such a narrative would have great value, and it is to be hoped that some day it may be written. The stories of some of the chief enterprises are well known, however, and in this connection a brief recital of the origin, rise and progress of some of the principal establishments would not be out of place.

In the year 1806 Almy, Brown & Slater began the erection of a factory on the south branch of the Blackstone River, in the northern part of the State, in a section of country that had previous to that time been a wilderness. The mill was finished and began operations in the spring of 1807, under the superintendence of John Slater, a brother of Samuel, who had arrived from England the previous year, and who is supposed to have brought a knowledge of some of the improvements in machinery made up to that time by English manufacturers. He became a member of the firm of Almy, Brown & Slater, each of the partners owning a fourth in the new mill and village, which was named Slatersville. Two more mills were subsequently built here, and the three factories have at various times been enlarged or rebuilt as occasion demanded. John Slater eventually bought out the other partners, and the mills and village are now the property of his grandson, John W. Slater.

Pawtucket abounds in historic factories. In 1810 the other partners bought out Mr. Slater's interest in the White mill which was erected in 1798, and run their business under the name of Wilkinson, Greene & Co. In 1824 the mill was burned, but was immediately rebuilt by Timothy Greene & Son, and is now occupied by the New England Thread Company, and William Mason, tape manufacturer. The mill now occupied by the Dexter Yarn Company, on the east side of the river was built by Wilkinson, Greene & Co. in 1813, partially destroyed in 1824, and rebuilt the same year. A stone mill was erected by Oziel Wilkinson in 1810, on the river side just south of the old Slater mill. This structure is still standing, and is now occupied by the Pawtucket Gas and Electric Light Company.

One of the earliest cotton manufacturers in the State was William Sprague. He

started a spinning mill in Cranston in 1808. This was the beginning of the immense business of the Sprague family, carried on for three generations. At the time of their failure in October, 1873, the firm of A. & W. Sprague were probably the most extensive cotton manufacturers in the world. The bleaching, printing and dyeing of calicoes was started by William Sprague at Cranston in 1824. In company with Christopher and William Rhodes he purchased the water privilege at Natick in 1821, and the partners built there a stone mill of large size for the times. This property was from time to time enlarged and passed into the hands of A. & W. Sprague in 1852.

Two mills were built by them at Quiddick, in Coventry, in 1849, and in 1852 a mill was built at Arctic. For miles the Sprague properties extended in Warwick and Coventry, in the Pawtuxet valley—they being owners not only of the mills, but of the tenements and extensive tracts of lands. A large part of this property has passed into the hands of the firm of B. B. & R. Knight.

Besides the factory started by William Sprague other cotton spinning mills were started in the town of Cranston previous to the year 1812, at Pawtuxet, Bellefonte, and Cranston village. The Bellefonte Company was started by William and Christopher Rhodes about 1810, and both cotton and woolen goods were at first manufactured. After many changes in ownership the place came into the possession of the Turkey Red Company in 1871.

The village of Olneyville was very early a centre of the cotton manufacture. A mill was built here in 1808. John Waterman built the Merino mill in 1812. According to the testimony of Zachariah Allen, it was in this mill, belonging to John Waterman and Henry Franklin, that all parts of the cotton manufacture from the manipulation of the raw cotton to the delivery of the finished cloth, were first accomplished.

Warwick was one of the earliest seats of the cotton manufacture, and in the order of time follows Pawtucket. The first mill in this section, as has already been stated, was built at Centreville, in 1794, and was purchased by Almy and Brown in 1801. This factory was for many years known as the old Greene mill, from its original projector, Job Greene. Benedict Lapham purchased it in 1852 and carried on the cotton manufacture very successfully within its walls until the erection of the present fine stone mill in 1873-4.

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lished the name of the manufacturer is omitted, but the letter can be seen at the office of the Pettee Machine Works if any one wishes to see it.

October 31, 1890.

F. J. Hale, Esq., Agent.

MY DEAR SIR: . . . I was much interested in what I saw yesterday at your works. I was more than glad to see that you had taken up this matter of the revolving flat card in the manner that you are doing, that you were putting forth every effort to supply a demand that is constantly increasing, and one which has been, and is now, so largely supplied by foreign manufacture. The move you have made is in the right direction. I believe that you are meeting the English manufacturer, not with a cheap slipshod machine that we need be afraid of, but with a finely built, first-class machine, one that is worthy to meet the Englishman in an even contest, and with the advantages afforded you by freight and the protective tariff you can whip him at every corner, build up a prosperous business, and in doing so furnish employment and bring comfort into a few hundred homes in Newton Upper Falls, instead of leaving us to assist in providing the same for English labor in a country in which we have no especial interest. It is a fact that cannot be ignored that the American manufacturer is coming to want and demand more and more the best of everything to do with. Competition compels him to seek for it, and if he cannot find in this country he is going to seek it elsewhere. One thing certain, the best he must and will have. At the present time we may be a little conservative, or rather a little shy of an American built Card. It isn't a strange thing that we should be. The Englishman got a little ahead of us on a card, but we need not lag behind, it isn't like us to do so; therefore you keep right along in the course you have adopted, viz.: strive for excellence in your work, and my word for it we will all get our eyes open soon, and when we do we are not going to pass our neighbor by for the sake of paying a stranger thirty-three to fifty per cent. more for an article in no way better, if as good. The Yankee as a rule is quick to see, and prompt to adopt a good thing. In business he may not be as patriotic as in state affairs; he may not business-wise be called a strict philanthropist, but these old New England sentiments are so thoroughly wrought within him that I feel sure that when he sees that he can save thirty-three to fifty per cent. on an investment, and at the same time foster and encourage and assist in building home industry, he will whip into line.

I was very much interested in a lucid explanation by your Mr. Flather of the means and methods you have adopted to insure nice and accurate results in your work, and in the ingenious devices used to test the finer points of workmanship. It seems to me that any practical man must be convinced of the merits of your work if he will take the time and trouble to investigate for himself, even though he may have become ever so "English, you know."

In closing I wish you all success. If I, in my limited experience and narrow observation, may be allowed to express an opinion, I should say you had struck the key-note, you have started right, your cause is popular and bound to grow more so; then stick to your text, let it be excellence of workmanship and material, and I bespeak for the Pettee Revolving Flat Card a grand future.

Yours truly,

The Pettee Machine Works have been entirely reorganized within a few years. Mr. David Nevins, of Boston, is now President; Mr. R. P. Snelling, of 79 Kilby street, Boston, is Treasurer; Mr. Frank J. Hale, Agent, and Mr. F. A. Flather, Superintendent.

Cotton in Rhode Island.

(Continued from page 30.)

At Crompton, a mile or so above Centreville, a small cotton mill was erected in 1807 by the Providence Manufacturing Company. The members of this company were Seth Wheaton, Thomas Sessions, John H. Pitman, Henry Smith, Nathaniel Searle, Jonathan Tiffany, Benjamin Remington, and William Rice. This was the first mill built of stone

in the State, and was commonly known as the "Stone Jug." The extensive mills at Crompton are now the property of the Crompton Company.

Three miles below Centreville at the junction of the two branches of the Pawtuxet river a mill was built in 1813 by the Greene Manufacturing Company, but the business came into possession, five years later, of Dr. Stephen Harris, who had been one of the original projectors of the enterprise. Subsequently two other mills were built and manufacturing was carried on here by the Harris family until some time in the '80's, when the entire property was bought by B. B. & R. Knight.

On many other available sites along the banks of the Pawtuxet in the first years of the century mills were erected. At what is now the village of Anthony, the Coventry Manufacturing Company began the erection of a mill in the autumn of 1805, and finished it in 1806. This mill was very large for the times, being eighty feet long and thirty wide. The members of the Coventry Company were James Burrell, Richard Jackson, John K. Pitman, William Valentine, Richard Anthony, William Anthony, Nathan Jackson and Samuel Arnold. These are all names well known in Rhode Island history. Richard and William Anthony were the sons of Daniel Anthony, to whom belongs the credit of making the first attempt in company with Lewis Peck and Andrew Dexter, to introduce the manufacture of cotton by machinery in Rhode Island. The late Senator Henry B. Anthony was a son of William Anthony. The second mill of the company was built in 1810, and was 125 feet long and six stories high at the south end. Both the old factories were taken down and a fine new mill erected in 1874.

At Washington Village a mill was built in 1812 by the Washington Manufacturing Company. It was burned in 1826, but was immediately replaced by a much larger factory of stone, which contained about one hundred looms and between 4,000 and 5,000 spindles.

A small cotton mill was erected at Coventry Centre in 1809. In 1823 the factory had 300 spindles and belonged to Lowry Arnold. At present the woolen mill of the Peckham Manufacturing Company is located here.

Early in the century Dr. Caleb Fiske, his son Philip and James DeWolf, of Bristol, began the manufacture of cotton on the northwest branch of the Pawtuxet, and named their new village Arkwright, in honor of the great English inventor. In 1817 Mr. DeWolf purchased the entire property.

Cotton manufacturing was begun at Phenix about 1810, and at that time the village and mill were named Roger Williams. In 1821 the first mill was burned. It was rebuilt in 1822, and a second mill was erected, the name of the company and the place being at the same time changed to Phenix.

At Lippitt, on the northwest bank of the Pawtuxet, a mill was built in 1807 by Christopher Lippitt, Charles Lippitt, Benjamin Aborn, George Jackson, Amasa Mason and William Mason, under the style of the Lippitt Manufacturing Company. This mill is said to have been the third in the State, and is still standing. Ex-Gov. Henry Lippitt, whose firm owns the Nourse, Globe and Social Mills at Woonsocket, is a grandson of Charles Lippitt, one of the original members of the Lippitt Company.

The village now known as Pontiac, the lowest water privilege on the Pawtuxet river, was founded in 1820 by John H. Clark. At that time a cotton mill was erected and the place was known as Clarksville. In 1846 Robert Knight and Zachariah Parker leased the plant, which had been much enlarged from its original condition. They soon purchased the property and in a short time Mr. Knight bought out his partner's interest. In 1852 Mr. Knight sold a half interest to his brother, Benjamin B. and the firm of B. B. & R. Knight was formed. The business increased rapidly and the Messrs. Knight obtained control of many cotton factories in Rhode Island and elsewhere, until at present they are probably the most extensive manufacturers of cotton goods in the United States.

The firm of Brown & Ives have for a longer period than any other existing company occupied a leading position among the cotton manufacturers of the State. Moses Brown, previous to the time when he was the means of bringing Samuel Slater to Pawtucket, had been a partner in the commercial firm of Brown Brothers, which became in 1796, Brown & Ives. While the business of the firm continued to be chiefly commercial until about 1830, as early as 1804 it became possessed of a controlling interest in a cotton mill erected that year in Blackstone, Mass. In 1827, in connection with Wilbur Kelly and General Edward Carrington, a cotton mill was started at Lonsdale, which became the nucleus from which the Lonsdale Company and the other extensive enterprises of Brown & Ives developed. A large mill at Ashton was erected in 1867, and one at Berkeley in

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Cotton in Rhode Island.

(Continued from page 32.)

1872. The latest addition to the property is the Ann and Hope mill, at Lonsdale, erected on the reputed site of William Blackstone's residence, "Study Hill." The firm also owns mills at Phenix and at Hope in the Pawtuxet valley.

David Anthony, who started the first factory of the Fall River Manufacturing Company in Fall River in 1813, worked in Slater's mill at Pawtucket from 1808 to 1812. Oliver Chace, the founder of a prominent family of Rhode Island manufacturers, was the first superintendent of the Troy mill in Fall river, started in 1813. Ex-Senator Chace and his brother, James H. who operate the mills at Albion are grandsons of Oliver, while Arnold B. Chace, the treasurer of the Valley Falls Company, is a great grandson. Cotton manufacturing was begun at Valley Falls as early as 1810, and the mills and tenements came into the possession of the Chaces in 1840. The first mill at Albion was built by the Wilkinsons, but passed into the Albion Company's hands in 1834.

A man, whose life connects the time of Slater with the present is Mr. Thomas J. Hill, the veteran machinery builder and cotton manufacturer. He was born in Pawtucket in 1805. At eight years of age he went to work in the old White Mill, and continued to work in the various cotton mills in Pawtucket until in 1822 he began to learn the trade of a machinist. In 1830 he came to Providence and went to work in the machine shop of the Steam Mill, which had come into Samuel Slater's exclusive possession the year before. Mr. Hill soon became foreman of the shop. In 1834 he entered into a partnership with Mr. Slater under the style of the Providence Machine Company. The business developed rapidly, and in 1846 Mr. Hill purchased the interest of the Slater heirs. Mr. Hill has been concerned in many cotton manufacturing and other enterprises, and success has always attended him. He founded in 1867 the village of Hill's Grove, and there established the Rhode Island Malleable Iron Works. At the same place in 1875 he started a cotton factory.

In the valley of the Woonasquatucket river the most prominent manufacturers were the Allen brothers, Philip and Zachariah, who were the means of developing the cotton manufacture at Allendale, Georgiaville, and elsewhere. Mainly owing to Mr. Zachariah Allen's efforts, a system of storage reservoirs for the saving of the surplus water of the river

in time of flood so that it could be utilized to run the factories during the dry season in summer, was devised early in the '20s. This system was also applied to some extent to the Pawtuxet river. Since the more general use of steam power this system has lost much of its value, but for a long period it was the only means that enabled many of the older factories to run all summer. The first power looms operated in Rhode Island were started in 1817 at Judge Lyman's factory, located on the Woonasquatucket at Lyman'sville.

The cotton manufacture was begun in Woonsocket as early as 1810. The excellence of the water power furnished by the falls attracted manufacturers, so that in 1831 there were said to be "upwards of 50,000 spindles operated at this place," and the mill sites were considered at that time the most valuable in the state.

Cotton spinning was begun at Hope Valley in 1810, at Wyoming in 1814, and at other places in the extreme south part of the State in the next few years.

EFFECT OF FACTORY SYSTEM ON SOCIETY.

In the early years of the century not only in Rhode Island but in all countries where the new system of manufacturing in factories rendered possible by the systematized Arkwright machinery, had come into operation, great objections were urged against the "Factory System." Some even went so far as to claim that the advantages gained in the production were more than counterbalanced by the social and physical degradation that was brought about. To a certain extent this was true in England, where the government had finally, by wise and beneficent laws, to interfere for the protection of the operatives. But in Rhode Island a different state of things existed. The factories were a means by which the rural population were helped and elevated. In the mills the farmers' sons and daughters found employment, and by the contact with their associates became brighter and better men and women. A democratic spirit prevailed that softened many of the hardships incidental to the toil of the mill, and rendered life in many of them pleasant and profitable. The gradual change in the personnel of the working population within the past quarter of a century has modified these conditions materially, but for the incomers as for their predecessors the life and opportunities of the Rhode Island factory village of to-day is probably superior to the condition of life from which they have changed to come here. To take a large view of the whole situation it may be said with

truth that if the spinning machinery and power loom had never been invented and the factory system introduced, the progress of the world during the last century would not have been as great as it has been, the many beneficent reforms in all lines that have been secured would not have resulted and the widespread intelligence, movement, and vigor of modern life would not be what it is.

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The Slater Monument.

ONE of the numerous good results accruing from the Cotton Centenary celebration is the renewed interest which is being exhibited in regard to the erection of a monument to Samuel Slater. At the October meeting of the Business Men's Association the project was renewed, and at the suggestion of Gen. Olney Arnold a committee was raised to report at a subsequent meeting "a systematic plan for the raising of funds to erect a monument to Samuel Slater; said committee also report the names of a working committee to carry the plans into effect."

In introducing the matter, Gen. Arnold said: "The great celebration is over, and Pawtucket having shown what it can do under many unfavorable circumstances, he thought the time had come for the monument. The country was prepared for it, and it was well to strike when the iron is hot. The monument," he continued, "should be erected by the manufacturers and business men of the whole country, and not by them alone. The operatives should contribute their mite, and the Sunday school scholars should be able to say, as they look at the finished work, 'We helped to build this monument.'"

The "Old Slater Mill" was completed in 1793, and by very many persons it is thought that 1893 would be a proper time to dedicate the proposed monument. If that date should be chosen, there is no time to be lost.

THE Pennsylvania Railroad Company has fitted up a wrecking car with dynamo, engine and all the appliances for furnishing electric light in case of an accident at night. The car is manned by a crew consisting of an engineer and four line men. The time occupied in starting up the lights is shown in the following instances: Wreck No. 1, seven lamps, three-eighths mile of wire, in one hour. Wreck No. 2, seven lamps, half mile wire, one and a half hours. Wreck No. 3, six lamps, an half mile wire, thirty minutes.