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T.H.E.S.I.S.

THE INDUSTRIAL EVOLUTION OF THE UNITED STATES.

HOWARD D. SMITH.

CLASS OF 1901.

THE INDUSTRIAL EVOLUTION OF THE UNITED STATES.

In 1789 at the close of the colonial period the United States consisted of the thirteen original colonies and the large tract known as the Northwest Territory claimed by them; in all comprising an area of 827,844 square miles. The first increment this domain received was the Louisiana and Oregon regions which together had an area of 1,171,933 square miles. The purchase of Florida in 1819, with the annexation of Texas and the Mexican cession, combined with the Gadsen purchase and that of Alaska from Russia in 1867 makes the present area of the United States 3,558,000 square miles, not including the Philippines, Hawaii or Porto Rico.

The great industrial progress of the country is due to the fact that she possesses all the natural resources necessary to the development of her agriculture, commerce and manufactures, the three great industries of the world.

During the early colonial days colonists devoted themselves mostly to agricultural pursuits. Many of them had come to America expecting to find gold in abundance,

but disappointed in that they turned to the soil and the forest for a livelihood. The fisheries were also an important occupation of the early pioneers along the coast.

The first exports of the northern settlements were shingles, ship timber and other products of the forest. As the number of settlements increased and extended inland, more diligent search was made for minerals, and their discovery was an important factor in the development of the country. The discovery of gold in California in 1849 gave mining the greatest impetus it has ever received and its effect on the industries on the country has hardly been equalled.

The nation's natural resources were valued at \$3,137,650,391 in 1889 and the total wealth was \$85,037,091,197. Of this amount agriculture contributed \$2,460,107,454; the fisheries, \$44,277,514; mining, \$587,230,662; and lumbering, \$440,034,761. There are no comparative statements obtainable for the colonial period. The above figures clearly illustrate the development of the country when we think of the extent of these industries in 1789, then in their first stages.

From the time of the first settlement in Virginia the population grew until at the adoption of the constitution in 1789 it was nearly 4,000,000. In 1800, excluding Indians, it was over 70,000,000, or 20.7 inhabitants to the square mile. The center of population at the time of the first census was east of Baltimore; since then, it has worked westward until now it is in Indiana.

The influence of transportation on the development may best be shown by stating the increase of railroads. In 1830 there were but twenty-three miles of railroad; in 1882, there were 173,422, to which must be added the carrying facilities afforded by the rivers and Great Lakes in order fully to realize this influence.

These three elements land, resources, and people which form the foundation of our industrial evolution; these combined with the intelligence, inventive genius and courage of the American are all the factors essential to its industrial development.

In no other country in the world is it possible to trace clearly the agencies which have been foremost in

promoting its industrial evolution but this, in the case of the American nation, which is of comparatively recent birth, is clearly recorded. The colonists came here with no capital, nothing but the country's natural resources to depend upon, and by their own efforts laid the foundation of those industries whose magnitude today commands the admiration of the world.

The factory system which at present plays such an important part was unknown in the colonial days. Although mostly agricultural, people were forced by necessity to pursue certain mechanical industries. All labor was done by hand; only a few crude machines were then known, none of the so-called labor saving machinery being in existence at that time.

The settlers evidently had in mind from the first, the establishment of manufactures for among the earliest workmen brought over to Virginia were those who came for the purpose of making pitch, tar, glass etc; others were engaged in the manufacture of clapboards, wainscot and articles afforded by the forest. The first exports from this country consisted of these articles and were shipped

from Virginia to quiet the complaints of the London Company, which expected emigrants to send back cargoes of gold and silver.

Many useful industries were started by the colonists soon after reaching this country; iron works were founded, cordage was manufactured, and the cultivation of tobacco was begun. For all this skilled labor was required and so tradesmen were imported; such as, carpenters, masons, shipwrights etc. The southern settlements devoted themselves more to agriculture during the early days than to commerce and manufacturing, leaving the carrying trade to the northern colonies.

One of the first occupations of the northern settlements was shipbuilding. There are two reasons for this; first, small boats were needed for the coasting trade; secondly, the forests afforded ready material from which to construct vessels. This industry and agriculture took the lead during the early colonial days. The first vessel built in this country was constructed in 1614 on the Manhattan river and was used in exploring the coast.

From 1641 to the time of the Revolution the shipbuilding record is one of which the colonists may well have been proud. The only year for which a summary of this industry is found prior to the Revolution is 1789. This shows that 899 vessels had been built having an aggregate of 20,000 tons burden. Of these New Hampshire built 45, Massachusetts 137, Rhode Island 29, Connecticut 50, New York 19, New Jersey 4, Pennsylvania 22, Maryland 20, Virginia 27, North Carolina 12, South Carolina 12, Georgia 2. In 1782 the colonists built 182 vessels. These figures indicate the development of the industry up to the time of the Revolution, when it was almost wholly abandoned except for war purposes. It is evident that the southern colonies constructed but few vessels, but although they did not build, they furnished a large per cent of the material of which the ships were built.

The textile industries which to-day supply so much labor and capital, were among the later efforts of the colonists. It is not definitely known when they began to make their own cloth; still though no record exists to prove it there is little doubt that with the earliest

settlers came the spinning-wheel and the hand-loom. The first indication of their existence in this country is in a record of the Massachusetts colony under the date of 1638, where mention is made of "four yards of home made cloth". The early settlers depended upon the mother country for their clothing and all manufactured goods. About 1740 England put an export duty upon all woolsens and it is safe to say their home manufacture becoming a necessity among the colonists, began about this time. In 1638 a number of people, having been expelled from Yorkshire, England because of their religious views, came to this country and founded the town of Rowley in Massachusetts. Being familiar with the manufacture of woolen goods and having some capital, they set up a woolen and fulling-mill, and this was the real beginning of the homespun industries of America. The presence of the fulling-mill shows that enough cloth was manufactured to supply the people and also a surplus. After the adoption of the stringent English laws, the colonists made every effort possible to increase the manufacture of woolen

goods. The courts ordered the people to turn their attention to spinning and weaving, herdsmen were provided for by law, and a bounty given for the destruction of wolves. Some of the colonies offered premiums and in all of them an effort was made to stimulate the production of woollens, except in New Netherlands where the manufacture of all textiles was forbidden. What has been said of the woolen industry is also true of the cotton. The culture of the plant began in Maryland and gradually extended south; though raised to some extent, no exportation of any consequence was made until 1787 when 800 pounds were shipped to England. Why the cotton industry was not more firmly established earlier among the settlers is not known unless the separating of the cotton from the seed was too difficult. Another hindrance was the attitude of the mother country. Up to 1760 cotton cloth was made by hand machinery; about that time a number of machines were invented in England which completely revolutionized the textile industries, but the English took every precaution to prevent these machines from reaching the colonies, and thus the colonial period

showed little progress in the manufacture of cotton goods.

Flax and hemp were much used by the colonists, linen serving the purpose which cotton does to-day. The farmers grew their own material and their wives and daughters spun and wove it into cloth. The manufacture of linen made good progress in all the colonies except those in the South, where the cultivation of tobacco discouraged other industries. Indigo was introduced and aided somewhat in the development of the textile industries; silk was manufactured to a limited extent, but the textile industries were not able to compete with agriculture, commerce and the fisheries, which were the main pursuits of the inhabitants.

The first attempts of the colonists to manufacture their own clothing did not attract the attention of the mother country; but as they increased the English merchants complained to the board of trade with the result, that in 1699 a law was passed prohibiting the transportation of any cotton or woollen goods in colonial

vessels. The population at this time was about 260,000; thus with this barrier the struggle was hard. Another factor which hindered the development of manufactures was the scarcity and expense of labor. In certain industries this was so great that foreign merchandise could be purchased cheaper than the colonists were able to produce it, which alone prevented their expansion.

The art of printing, an essential factor in the evolution of industry, was early instituted by the colonists. The first printing-press was set up in Cambridge, Mass. in 1639. That year some pamphlets, an almanac and the first book published in this country entitled "The Bay Psalm Book" made their appearance. The second press was sent over in 1655 and was used for printing the Bible and other books to aid John Eliot in his missionary work. The first newspaper was issued September 25, 1690 in Boston, but there was only a single number as the government suppressed it. No record exists of any having more than one issue until 1704, when the News-Letter was published in Boston. By 1750 nearly all the colonies had at least one press; but the bulk of

the printing was done in Philadelphia and Boston. It was in the latter city that Benjamin Franklin learned his trade, which he pursued in Philadelphia to the great advantage of the colonies. At the breaking out of the Revolution, nine newspapers were published in Pennsylvania, four in New York, seven in Massachusetts, four in Connecticut, one in Rhode Island, one in New Hampshire, two in Maryland, two in Virginia, two in North Carolina, three in South Carolina and one in Georgia, making a total of thirty-seven then in circulation. Very few magazines were issued up to the time of the Revolution, the total number being less than one hundred. Bookselling was often combined with printing and many printers were dealers in general merchandise.

The printer met many obstacles in his occupation. Labor was high, people had but little time for reading and for a number of years before the Revolution the English revenue laws were a serious obstacle. During the colonial days the printer also bound the book so that his business was not so clearly defined as it is at present.

In 1775 there were ninety-two booksellers in Boston, eighteen in other parts of New England, twelve in New York, thirty-eight in Philadelphia and the remaining states added six more to the list, which shows the development of a business that to-day is of enormous size.

Other important industries founded by the colonies were lumbering and the manufacture of building materials, such as brick and glass. They established grist-mills together with saw-mills, thus utilizing the power for a double purpose. In 1770 the exported products of the saw-mill were valued at \$688,588. These consisted of boards, plank, scantling, timber for masts, spars, staves, headings, hoops and poles. Shortly after the close of the colonial period when steam had become a factor in this industry, 65,846,024 feet of lumber, 80,812,357 shingles, 22,028,707 hoops, staves and headings were exported, showing the extent of the industry.

The products of the windmills were of great value to the people, Philadelphia alone exporting 389,368 barrels of flour in 1788; while the total export of flour for all the colonies in 1791 was 619,681 barrels, besides

more than 1,000,000 bushels of wheat.

The dwellings of the colonists were not much more than huts and their transition is one of the clearest defined features of the country's industrial development. Their evolution into the large frame house and stone or brick structure shows how the building material industries developed and marks the intellectual progress of the people.

The iron industry was one of the first to be established by the colonists. They needed the iron for use in the erection of buildings and in shipbuilding, consequently this industry received much attention. The number of iron-works in New England in 1721 was twenty-five, but there were no refineries for the pig-metal; they came into use during the next score of years. The northern colonies were the first to develop the iron industry, Connecticut taking the lead, though all the other colonies engaged in it to some extent. The manufactures included sheetiron, steel, nail-rods, nails, farming implements, stoves, household utensils, iron work for ships, anchors and other castings. The great iron

producing state of Pennsylvania did not develop this industry until later, the first attempt being made in 1716. Small works sprang up wherever a deposit of bog-ore could be found. By 1728 the industry was firmly established in Pennsylvania, the colony exporting two-hundred and seventy-four tons of pig-iron that year. In this state the industry made rapid progress and assumed many forms; furnaces, foundries, rolling-mills, nail-works, wire-mills and manufactories of many kinds of metallic material were established. The nucleus of the present Carlisle works was founded in 1762. Pennsylvania, previous to the war, exported two thousand tons of iron annually; Virginia and Maryland about 1750, over two thousand five hundred tons of pig-iron. In 1775 the total exports of bar and pig-iron from this country were seven thousand five hundred and twenty-five tons. The war was a great stimulus to the iron industry; but at its close the exports dropped to a little over three hundred and sixteen tons. The southern colonies were devoted to agriculture, so that the iron industry was in Pennsylvania, the New

England and Southern States contributing but a small share.

One of the most important factors in the industrial development of the country during the colonial days is that of labor and wages. The first settlers at Virginia and Plymouth undertook to regulate their work on the community basis, but they soon saw that this would not be successful so it was abandoned. The Pilgrims then tried to regulate wages by statutes. An employer who paid above the amount fixed by law was fined, but this, too, was unsuccessful, so the law was repealed and a committee appointed to adjust wages whenever the employers and employees could not agree. The early importation of slaves into Virginia prevented many of the disputes over wages which occurred in the northern colonies. Skilled labor was subjected to these annoying regulations; but aside from this hindrance workmen were in a fairly comfortable condition, labor being in great demand. Common laborers were paid two shillings a day, women from four to five pounds a year, and Indians eighteen pence per

day. The eighteenth century saw some improvement in wages. At the close of the colonial period, agricultural laborers received forty cents a day; butchers, thirty-three; carpenters fifty-two; shipbuilders, ninety; shoemakers, seventy cents. The figures indicate the general condition of the laborer as far as wages were concerned. Prices varied somewhat during this period, but from 1700 to the close, there was but slight variation, except during the time of the war. Corn was worth about three shillings per bushel; wheat, six; and most things were comparatively cheap.

The making of textiles, lumbering, saw and planing business, iron and steel manufacture, the building trades, printing and publishing, milling with the addition of the boot and shoe manufacture, were the principal industries during the colonial period, and they are the ones that constitute the bulk of the manufactures of this country to-day. They employ fifty-four per cent of the total capital and produce sixty-four per cent of the product.

The exports in 1789 aggregated nearly \$20,000,000 to which it is estimated that the manufacturing industries

contributed about \$1,000,000. The total manufactures at the close of this period amounted to \$20,000,000. The great drawback to the development of the manufacturing industries was foreign competition. Many ventures started during the war had to be abandoned because of the competition of England, the scarcity and high price of labor, and lastly the lack of legislative protection necessary to their development.

The adoption of the Constitution in 1789 marks the beginning of a new era in the country's industrial development. The commercial situation was largely what led to the forming of the new Constitution; after its adoption came the change in the method of manufacturing and the birth of the factory system. The growth of the factory system was greatly hampered after the close of the Revolution by the restrictive legislation of Great Britain, which prohibited the exportation of any of the newly invented machinery necessary for the development of the factory system, sought to use the United States as a market for her manufactures, and tried to hinder as far as possible its development.

Before the close of the war, all mills had to be built on streams; but on the application of steam to manufacturing, mills could be built near the large towns, and thus afford occupation to the masses.

Rhode Island has the honor of having erected the first mill equipped with modern machinery. This factory was established by Samuel Slater in 1790 at Pawtucket, in honor of which he has received the title of "the father of American manufactures". This was the beginning of the factory system of America. The cotton industry was greatly enlarged four years later through the invention of the cotton-gin by Eli Whitney.

Although to England is due the origin of the factory system, America established the modern scientific factory, where what enters as raw material comes out a finished product.

Thus the foundation of the great industries was laid during the colonial days and completed by the adoption of the Constitution in 1788 and the establishment of the factory system in 1790. From that time their growth has been steady

and rapid. There have been a few periods of reverse, but these have been overcome and the industries have flourished.

The history of the industrial development since 1790 falls into two periods; one, from 1790 to 1860; and the other from 1860 to the present time. This division results from the Civil War and its effects on the industries of the country, the discovery of new sources of wealth, and the invention of new processes of production which resulted in the displacement of hand labor by machinery.

No one industry better illustrates the growth of all than cotton manufacture and none shows more clearly the effect of the new system. In 1831 there were 801 cotton factories in the country; ten years later there were 1,240; in 1850, 1,074; and in 1860, 1,081. This decrease from 1840 to 1860 is due to the consolidation of the small and the establishment of large works.

During all this period the consumption of cotton and the production of goods constantly increased. In 1831 the total number of spindles was 1,246,703, in 1860, 5,335,727, and the number of looms increased from 23,423 in 1831

to 128,818 in 1860. The capital invested in this industry in 1831 was \$40,612,984; in 1860, it was \$38,585,288. The total product for 1831 is not known; in 1860, it was \$115,681,774. Of this amount New England produced \$79,359,900; the Middle States, \$23,534,700; the Southern States, \$8,460,237; and the Western States, \$1,326,837. In 1831 the Southern States had only \$290,000 invested in the cotton industry; in 1860, they had \$9,840,221, which shows the development of the industry in those states. The above figures indicate the evolution of the cotton industry which is a good example of the progress made by all the other industries.

The textile and iron are indicative of the whole industrial expansion of this country, and their growth can be best understood by comparing the value of manufactures in 1810 with those of 1860. The total value of all the manufactures of this country in 1810 was \$188,613,474. In the distribution of this product, Pennsylvania stood at the head with \$32,691,111, New York next with over \$25,000,000, then Massachusetts with nearly \$22,000,000; Virginia with \$15,250,000; Maryland with nearly

\$11,500,000; Connecticut with over \$7,750,000; New Jersey \$7,000,000; North Carolina \$6,500,000; Kentucky over \$6,000,000; while the manufactured products of Vermont, New Hampshire, Rhode Island, South Carolina, Georgia and Maine varied from \$3,500,000 to \$5,500,000. In 1860 the value of the mechanical products had reached \$1,885,861,678 as compared with \$198,612,474 in 1810; the total value of cotton goods was \$115,681,774, that of woolen \$61,895,217. The products of the clothing industry were valued at \$72,212,765, those of the boot and shoe industry at \$91,891,489. A new industry that made its appearance during this period, was the manufacture of waterproof goods, its products amounting to \$5,768,450 in 1860. The distribution of manufactures over the country was far more general in 1860 than in 1810. New York led in the value of her manufactures. In 1860 they were over 379,000,000; Pennsylvania was second with 290,000,000; Massachusetts, third, with over 255,000,000. These were the only ones that passed the 200,000,000 mark. There was only one state with over 100,000,000 Ohio, produced 122,000,000; Connecticut

82,000,000; New Jersey 78,000,000; California 68,000,000; Illinois 57,500,000; Virginia 50,500,000. All the other states were below the 50,000,000 line.

One of the greatest influences in bringing about this expansion of the manufacturing industries is invention. In 1860 there were 4,819 patents issued. New inventions were constantly being made which simplified the method and reduced the cost of production. The most striking influence of invention is in the boot and shoe industry. Formerly a few men worked in small shops and made all the shoes by hand; to-day, these small shops are replaced by large factories, and most of the work is done by machines with the result of a vast increase in the production and a reduction of price.

With the close of the Civil War began a new industrial era. Before the war there existed two conflicting systems of labor; in the South, agricultural industries were the only ones of importance. The northern industries grew more and more diversified while the southern were almost wholly along one line. The South possessed resources of great abundance, rich deposits of iron ore, coal, vast

tracts of timber, which remained undeveloped up to the time of the Civil War.

White labor could not compete with slave labor, with the result that many of the native-born whites left their home state for one where labor stood on an equal basis. Out of a population of 808,000 in North Carolina, the census of 1880 disclosed the fact that 272,000 had left for other regions. In Virginia 400,000 had left out of 1,400,000.

The large amount of land necessary for the cultivation of tobacco and cotton, made the population scattered, and rendered manufacture impossible. The war changed the industrial system of the South to one directly opposite, making a manufacturing as well as an agricultural people out of the population, and as a result the South came into industrial competition with the North and with Europe.

The growth of manufacturing in the United States has been so rapid since 1880, that hardly any one industry can be selected that will show the most striking features of the period.

The capital invested in the mechanical and manu-

facturing industries in 1860 was \$1,009,855,715 and the product was \$1,885,861,876.

The New England and Middle States contributed sixty-seven per cent of this product, although the establishments were scattered throughout thirty-seven states and territories. In 1890 the amount invested in the mechanical and manufacturing industries had risen to \$8,525,150,466, and the value of the product was \$9,377,427,284, an increase of five hundred and forty-six per cent in capital and three hundred and ninety-seven in the product, making the value of these industries \$140 per capita.

We now come to the period in the industrial development of this country which has been unequalled in the history of mankind, from 1860 to 1890.

In 1890 the value of the mining products was \$587,280,682, sericultural products \$2,460,107,454, fishery products \$44,277,514 making an aggregate of \$12,404,052,912 or \$189 per capita for all industries.

The center of the manufacturing industries has followed the advance of population to the Western States; in 1860 it was in Pennsylvania, in 1890 it was near Canton, Ohio.

The principal industries in 1880 were the textiles, clothing, lumber, iron and steel, leather, flour and meal, boots and shoes, sugar, paper, printing and publishing, carriages and wagons, foundry and machine-shop products, liquors distilled and malt.

The textiles excel any other single industry in value and quantity of product, variety, and importance. The total capital invested in textiles increased from \$150,080,859 in 1860 to \$728,072,881 in 1890 or three hundred and ninety-three per cent. The product increased from \$214,740,814 to \$721,949,262 or two hundred and thirty-six per cent. 89.37 per cent of this product was produced by the New England and Middle States in 1890. The New England States alone producing 50.64 per cent, the Middle States 28.73 per cent. Massachusetts produced 25.62 per cent of the total product of the country.

The cotton industry stands first in the different branches of the textile industry. There were 1,091 establishments engaged in the manufacture of cotton goods in 1860, having an average of 4,798 spindles per establishment. In 1890 there were 906 with an average of 15,677

spindles, an increase of 227 per cent in the number of spindles per establishment. The capital invested in this industry increased from \$98,585,269 to \$354,020,848 during the thirty years from 1860 to 1890 and the product from \$115,681,774 to \$267,881,724. The concentration is not so marked in the other branches of the textile industry as in this, as is shown by the decrease in the number of establishments and the increase in the product.

The capital invested in the woolen industry increased during this period from \$38,814,422 to \$245,826,748, or 532 per cent; and the product from \$73,454,000 to \$270,527,511, or 268 per cent. The number of looms rose from 16,075 to 639,700; of the spindles, from 69,658 to 2,793,147. The average value for each establishment in 1860 was \$49,786; and in 1890 it was \$159,792.

The increase in the amount of capital invested and in the value of the product as been as rapid in the other branches of the textiles as in the cotton and woolen. Rapid progress has been made in the manufacture of carpets, silk goods, dyeing and finishing.

The manufacture of men's ready made clothing was

recognized as a distinct industry in 1890, there being 5,007 establishments with a product of \$251,803,684. The manufacture of clothing and all articles worn exclusive of jewelry and foot-wear, had a product in 1890 that amounted to \$700,000,000. This industry is confined entirely to the large cities.

The boot and shoe industry turns out a product valued at \$280,215,185 and has a capital of \$117,923,375, invested in 12,684 establishments. The total number of boots and shoes made in 1890 was 179,409,388 pairs. In 1880 there were 12,487 establishments, with a capital of \$23,358,527 and a product of \$81,891,489.

The industry ranking next to the textile and clothing industries is the manufacture of food products. This had 16,858 establishments, with a combined capital of \$104,927,586 and a yearly product of \$323,023,598. The manufacture of canned goods was not a distinct industry in 1880, but in 1890 it had become such and had a capital of \$24,532,581 and a product of \$49,886,305. The growing demand for manufactured food products had increased the number of establishments in 1890 to 41,608 with a capital of \$524,666,426

and an output of \$1,847,477,290.

The four principal branches of this industry: namely, the bread, cracker and bakery products; flouring and grist-mill products; slaughtering and meat packing; and the refining of sugar and molasses, exceeded \$100,000,000 in their annual product. The increase in the production of flour, meal and other grist-mill products has kept pace with the increase in population and agriculture. The capital invested has increased 146 per cent and the product 107 per cent; but owing to the decrease in the value of flour and meal and the increase in the production of the mills, the increase in the value of the product given above does not convey a correct idea of the actual increase since 1860.

A number of new industries have appeared since 1860. The principal among these are slaughtering and meat packing, manufacture of butter and cheese, oleomargarine and butterine, typewriting machines, bicycles, etc. The first data concerning the slaughtering and meatpacking industry is for the year 1870, when it had a capital of

\$22,124,727 and a product of \$22,140,429. In 1890 it had a capital of \$116,887,504 and a product of \$581,311,308.

The total quantity of cheese and butter as a dairy product in 1860 was 102,662,927 pounds of cheese and 459,881,372 pounds of butter. For the year 1890 there was produced 258,761,882 pounds of cheese and 1,205,508,284 pounds of butter in the United States, including the dairy and the manufactured products.

No industry shows such a growth in specialization and such an improvement in the form and character of the finished product as that of iron and steel, the products ranging from huge iron structures to delicate surgical instruments. The manufacture of iron and steel products was one of the largest industries in 1860. Since then the capital invested has increased from \$48,372,897 to \$414,044,844 in 1890, and the product from \$57,189,248 to \$476,387,519, because of the great demand for all kinds of iron and steel manufactures. The total product of steel in 1860 was 5,049,693 gross tons. The principal cause of the development of the iron industry is the rapid growth of

railroads. The increase in the manufacture of steel has been so rapid, that in 1890 it exceeded that of Great Britain by 1,270,850 tons. Another stimulus to the iron industry has been the production of coke. This was carried on in twenty-one establishments in 1860. The total capital amounted to \$82,300 and the product \$189,844, which had increased to \$17,482,729 and \$16,498,245 respectively in 1890.

The production of petroleum is another industry that has appeared since 1860 and assumed large proportions. The daily product in 1860 did not exceed 200 gallons; in 1891, the yearly product was 54,291,980 barrels. The total production from 1858 to 1890 amounted to 807,000,000 barrels. It is estimated that the product of this industry in the United States constitutes fifty-seven per cent of the production of the world.

Another industry following the production of petroleum is the refining of the crude products, which are principally illuminating oils and naphtha. 17,000,000 barrels of illuminating oils and 3,000,000 of naphtha were refined in 1889. The number of establishments was 94, the capital being \$77,418,298 and the product \$85,001,198.

Other industries that have contributed to the development of the country are lumbering and the manufacture of brick and tile. The output of the lumber and planing-mills increased from \$108,948,393 in 1860 to \$621,628,934 in 1890. There were 1,678 establishments in 1860 engaged in the manufacture of brick and tile, with a capital of \$7,894,428 and a product of \$11,263,147. In 1890 there were 5,828 establishments with a capital of \$82,578,566 and a product of \$67,770,685, making an increase of 502 per cent in value of product.

The factories engaged in the manufacture of rubber-goods increased from 29 in 1860 to 188 in 1890; the capital invested advanced 912 per cent. The importation of crude rubber was 2,125,561 pounds in 1868 and in 1893 it was 42,962,554 pounds.

The increase in the printing and publishing business in the United States is far in advance of that in any other country, and well illustrates the progress of civilization and the advance in the arts and manufactures. In 1860 there were 1,668 establishments devoted to this

industry with a capital of \$19,322,218 and a product of \$21,033,898. In 1890 there were 13,536 establishments with a capital of \$195,287,445 and a product of \$275,452,515. There were 17,616 periodicals in circulation in 1890.

The growth of manufactures and the progress of industry during the last one hundred years in the United States is best shown by the following figures. In 1790 the manufactures had a product of \$20,000,000 in 1890 \$9,272,437,283.

The states that were in the lead in the distribution of the manufacturing products in 1880 were still in the lead in 1890. New York came first with \$1,711,577,371; Pennsylvania second with \$1,321,794,901; Illinois with \$808,640,280; Massachusetts, which was third in 1880, is now fourth with a product of \$828,160,402; then Ohio with \$641,688,064. These are the only states with a product of over half a billion. There are several ranging from a million to a quarter of a billion.

The wonderful development of the natural resources,

the discovery of new sources of wealth, coupled with the ambition to supply the home demand and the effort to increase our foreign trade, have made the industrial progress of the nation one of continual expansion, and built up industries of a magnitude unequalled by any other country commanding the attention and admiration of all civilized nations and bidding fair to make the United States the master of the industrial world.