

It is a gratifying fact, shown by the official statistics, that while our older communities have greatly extended their manufactures, the younger and more purely agricultural States, and even the newest Territories, have also made rapid progress. Nor has this department of American industry been cultivated at the expense of any other. There is much reason to believe that it affords the safest guarantee of the permanency and success of every other branch. Evidence bearing upon this point is found in the manufacture of agricultural machines and implements, which is one of the branches that shows the largest increase in the period under review. There is little doubt that the province of manufactures and invention in this case has been rather to create than to follow the demand. The promptness of Americans to adopt labor-saving appliances, and the vast areas devoted to grain and other staples in the United States, have developed the mechanics of agriculture to an extent and perfection elsewhere unequalled. The adoption of machinery to the extent now common in farm and plantation labor furnishes the best assurance that the development of agriculture or manufactures to their utmost, can never again justify the old charge of antagonism between them in regard to labor, or injuriously affect either by materially modifying its cost or supply.

The total value of AGRICULTURAL IMPLEMENTS made in 1860 (Table No. 8) was \$17,802,514, being an increase of 160.1 per cent. upon the total value of the same branch in 1850, when it amounted to the sum of \$6,842,611. This manufacture amounted in New England to over two and three-quarter millions of dollars—an increase of 65.8 per cent. In the middle States the value was nearly five and a half millions, having increased at the rate of 122.2 per centum. In the western States, where the increase was most extraordinary, the value of implements produced was augmented from \$1,923,927 to \$7,955,545. The increment alone in those States was, therefore, only a fraction less than the product of the whole northern section of the Union in 1850, and was greater by 313 per cent. than their own manufacture in that year. In each of the States of Ohio and Illinois, which are the largest manufacturers in the west, the value of the product exceeded two and a half millions dollars, being an increase in the former of 382, and in the latter of 235 per cent. in ten years. Michigan, Indiana, and Wisconsin increased their production of agricultural implements 1,250, 386 and 201 per cent., respectively. While in some of the southern States there has been a decrease, in Virginia, Alabama, and Louisiana the increase in this branch has been large, and in Texas, which reported none in 1850, agricultural implements of the value of \$140,000 were manufactured in 1860. The whole value produced in the southern States in the latter year (including cotton gins) was \$1,582,483, exhibiting an increase of over 101 per cent. in the last decade.

The quantity of PIG IRON returned by the census of 1860 (Table No. 9) was 884,474 tons, valued at \$19,487,790, an increase of 44.4 per cent upon the value returned in 1850. Bar and other ROLLED IRON (Table No. 10) amounted to 406,298 tons, of the value of \$22,248,796, an increase of 39.5 per cent. over the united products of the rolling mills and forges, which in 1850 were of the value of \$15,938,786. This large production of over one and a quarter million of tons of iron, equivalent to 92 pounds for each inhabitant, speaks volumes for the progress of the nation in all its industrial and material interests. The manufacture holds relations of the most beneficial character to a wide circle of important interests intimately affecting the entire population; the proprietors and miners of ore, coal, and limestone lands; the owners and improvers of woodlands, of railroads, canals, steamboats, ships, and of every other form of transportation; the producers of food, clothing, and other supplies, in addition to thousands of workmen, merchants, and capitalists and their families, who have directly participated in the benefits resulting from this great industry. It has supplied the material for an immense number of founderies, and for thousands

of blacksmiths, machinists, millwrights, and manufacturers of nails, hardware, cutlery, edged tools, and other workers in metals, whose products are of immense aggregate value and of the first necessity. The production of so large a quantity of iron, and particularly of bar iron, and the demand for additional quantities from abroad, tell of the progress of the country in civil and naval architecture and all the engineering arts; of the construction of railroads and telegraphs, which have spread like a net over the whole country; of steam-engines and locomotives; of spinning, weaving, wood, and metal working, milling, mining, and other machinery; and of all the multiform instruments of science, agriculture, and the arts, both of peace and of war; of the manufacture of every conceivable article of convenience or luxury of the household, the field, or the factory. The aggregate statistics of iron exhibit the extent to which the general condition of the people has been improved by this great agent of civilization during the ten years embraced in this retrospect.

The materials for the manufacture of iron—ore, coal and other fuel, water power, &c.—are so diffused, abundant, and cheap that entire independence of foreign supplies appears to be alike desirable and attainable at no distant period.

Probably no class of statistics possesses more general interest, as illustrating the recent progress of the country in all the operative branches, and in mechanical engineering, than those relating to MACHINERY, (Table No. 11.) Nearly every section of the country, particularly the Atlantic slope, possesses a great affluence of water power, which has been extensively appropriated for various manufacturing purposes. The construction of hydraulic machinery, of stationary and locomotive steam-engines, and all the machinery used in mines, mills, furnaces, forges, and factories; in the building of roads, bridges, canals, railways, &c.; and for all other purposes of the engineer and manufacturer, has become a pursuit of great magnitude. The annual product of the general machinists' and millwrights' establishments, as returned in the census of 1850, was valued at \$27,998,344. The value of the same branch, exclusive of sewing-machines, amounted in 1860 to \$47,118,550, an increase of over eighteen millions in ten years. The middle States were the largest producers, having made over 48 per cent. of the whole, but the southern and western States exhibit the largest relative increase. The ratio of increase in the several sections was as follows: New England, 16.4 per cent.; middle States, 55.2; southern, 38.7; and western, 12.7 per cent. The Pacific States produced machinery of the value of \$1,686,510, of which California made \$1,600,510. In Rhode Island the business was slightly diminished, but in Connecticut it had increased 165 per centum. The great facilities possessed by New York and Pennsylvania in iron, coal, and transportation, made them the largest manufacturers of machinery, which in the former was made to the value of \$10,484,863, and in the latter, \$7,243,453—an increase of 24.4 and 75 per cent., respectively. New Jersey raised her product to \$3,215,673, an increase of 261 per cent., while Delaware and Maryland and the District of Columbia exhibited an increase of 82, 41, and 667 per cent., respectively. In all the southern States the value of the manufacture, though small, was largely increased; the ratio in Virginia, the largest producer, being 236 per cent., while in Mississippi, Alabama, and South Carolina, the next in amount of production, it was 1,626, 270, and 525 per centum, respectively. This was exclusive of cotton-gins, which were included with agricultural machinery. Ohio was the largest producer in the west, and the fourth in the Union, having made to the value of \$4,855,005, an increase of 125 per cent. on the product of 1850. Kentucky ranked next among the western States, having produced over one million dollars' worth, and increased her product 213 per cent. The ratio of increase in the other western States was, in Indiana, 98; in Illinois, 24; Wisconsin, 208; Missouri, 214; and Iowa, 2,910 per cent, respectively; but in Michigan there was a small decrease in the amount manufactured.

Besides a large amount of machinery and other castings included in the re-

turns of machine shops, the value of the production of IRON FOUNDERIES, returned by the census of 1860, (Table No. 12,) reached the sum of \$27,970,193, an increase of 42 per cent. on the value of that branch in 1850, which was \$20,111,517. New York, whose extensive stove founderies swell the amount of production in that State, made to the value of \$8,216,124, and Pennsylvania, \$4,977,793, an increase of 39 and 60.9 per cent., respectively.

With the subject of iron and its various manufactures that of FOSSIL FUEL (Table No. 13) naturally associates itself. The unequalled wealth and rapid development of the coal fields of the United States as a dynamic element in our industrial progress affords one of the most striking evidences of our recent advance. The product of all the coal mines of the United States, in 1850, was valued at \$7,173,750. The annual value of the anthracite and bituminous coal, according to the Eighth Census, was *over nineteen millions* of dollars. The increase was over twelve millions of dollars, and was at the rate of 169.9 per cent. on the product of 1850. It was chiefly produced in Pennsylvania, Ohio, and Virginia. The coal mined in Pennsylvania, in 1850, was valued at \$5,268,351. In the year ending June 1, 1860, the State produced 9,397,332 tons of anthracite, worth \$11,869,574, and of bituminous coal, 66,994,295 bushels, valued at \$2,833,859, making a total value of \$14,703,433, or an excess of \$7,529,683 over the total product of the Union in 1850. Of bituminous coal, Ohio raised 28,339,900 bushels, the value of which was \$1,539,713; and Virginia, 9,542,627 bushels, worth \$690,188. The increase in Ohio was \$819,587, and in Virginia, \$222,780, in the value of mineral fuel, being at the rate of 113 per cent. in the former, and 47.6 per cent. in the latter. The increase in Pennsylvania was 179 per centum on the yield of 1850.

The development of our several valuable mines of coal, iron, lead, copper, zinc, gold, silver, quicksilver, chrome, &c., (Table No. 14,) is a subject of the highest satisfaction, constituting, as they do, the repository and fountainhead of crude materials for an immense and varied industry in the metallurgic and chemical arts. Mining in its several branches employs a very large amount of capital and great numbers of our laborious population, and shows a steady increase in the last ten years. The product of the gold mines in the Atlantic States has, however, fallen off since the discoveries of gold in California.

The increase of PRINTING PRESSES in the book and newspaper manufacture (Table No. 15) has been great beyond all precedent, and has exerted the most beneficent influence by cheapening and multiplying the vehicles of instruction. Its effects are everywhere apparent. Never did an army before possess so much of cultivated intellect, or demand such contributions for its mental food as that now marshalled in its country's defence. Many of these reading soldiers ripened their intellectual tastes during the last ten years. In fact, many divisions of our army carry the printing press and type, and the soldiers issue publications and print the forms for official papers. The press is, indeed, the great prompter of enterprise. It constantly travels with the emigrant to diffuse light and intelligence from our remotest frontiers, where it speedily calls into existence the paper-mill and all the accessories which it supports in older communities.

In New England, the Middle, and Western States the value of book, job, and newspaper printing is returned as \$39,428,043, of which eleven millions' worth consisted of books, the value of the latter being nearly equal to the whole product of the same branch in 1850, which was returned at \$11,586,549. The manufacture of PAPER, especially of printing paper, has increased in an equal ratio, the State of Massachusetts alone producing paper of the value of \$5,968,469, being over 58 per cent. of the product of the Union in 1850. New York returned paper of the value of \$3,516,276; Connecticut, \$2,528,758; and Pennsylvania, \$1,785,900.

The SEWING MACHINE (table No. 16) has also been improved and introduced, in the last ten years, to an extent which has made it altogether a revolutionary

instrument. It has opened avenues to profitable and healthful industry for thousands of industrious females to whom the labors of the needle had become wholly unremunerative and injurious in their effects. Like all automatic powers, it has enhanced the comforts of every class by cheapening the process of manufacture of numerous articles of prime necessity, without permanently subtracting from the average means of support of any portion of the community. It has added a positive increment to the permanent wealth of the country by creating larger and more varied applications of capital and skill in the several branches to which it is auxiliary. The manufacture of the machines has itself become one of considerable magnitude, and has received a remarkable impulse since 1850. The returns show an aggregate of 116,330 machines made in nine States in 1860, the value of which was \$5,605,345. A single establishment in Connecticut manufactured machines to the value of over \$2,700,000, or nearly one-half of the whole production in that year. During the year 1861 sewing-machines to the value of over \$61,000 were exported to foreign countries. It is already employed in a great variety of operations and upon different materials, and is rapidly becoming an indispensable and general appendage to the household.

Among the branches of industry which have been signally promoted by the introduction of the sewing-machine is the manufacture of men's and women's CLOTHING (Table No. 17) for sale, which has heretofore ranked with the cotton manufactures in the number of hands—two-thirds of them females—and the cost of labor employed. The increase of this manufacture has been general throughout the Union, and in the four cities of New York, Philadelphia, Cincinnati, and Boston, amounted in value to nearly forty and one-quarter millions of dollars, or over 83 per cent. of the product of the whole Union in 1856. The manufacture of shirts and collars, of ladies' cloaks and mantillas—a new branch which has received its principal impulse within the last ten years—and of ladies' and gentlemen's furnishing goods generally, form very large items in the general aggregate of this branch. They severally employ extensive and numerous establishments, many of them in our large cities with heavy capital. In Troy, New York, the value of shirt collars alone annually manufactured is nearly \$800,000, approximating in value to the product of the numerous and extensive iron founderies which have been a source of wealth to that city.

The influence of improved machinery is also conspicuously exhibited in the manufacture of SAWED and PLANED LUMBER, (Table No. 18,) in which the United States stands altogether unrivalled, as well for the extent and perfection of the mechanism employed as the amount of the product. This reached, in 1850, the value of \$58,521,976, and, in 1860, \$95,912,286, an increase of 64 per cent. in the last decade. The western States alone, in the latter year, produced lumber to the value of \$33,274,793, an increase of \$18,697,543, or 128 per cent. over their manufacture in 1850. The Pacific States and Territories produced to the value of \$6,171,431, and the southern \$17,941,162, a respective increase of \$3,841,826 and \$9,094,686 in those sections, being a ratio of 162.7 and 102.3 per centum.

Several branches of manufacture have an intimate relation to agriculture and the landed interests, and by their extension powerfully promote those interests as well as that of commerce. Surpassing all others of this or any other class in the value of products and of the raw material consumed, is the manufacture of flour and meal. The product of FLOUR and GRIST MILLS in 1850 (Table No. 19) reached a value of nearly one hundred and thirty-six millions of dollars, while in 1860 the returns exhibit a value of \$223,144,369—an increase of

\$87,246,563, or 64.2 per cent. in the last ten years. The production and increase of the several sections were as follows:

	Value of flour and meal.	Increase.	Per cent. increase.
New England States	\$11,155,445	\$4,834,959	76.5
Middle States	79,086,411	10,653,232	15.5
Western States	96,038,794	53,364,802	125.0
Southern States	30,767,457	14,185,640	85.5
Pacific States	6,096,262	4,207,930	222.8

The largest mill is in Oswego, New York, which in 1860 produced 300,000 barrels of flour; the next two, in Richmond, Virginia, made 190,000 and 160,000, respectively; and the fourth, in New York city, returned 146,000 barrels. The value of annual production of each ranged from one million and a half to one million dollars.

The manufacture of SPIRITUOUS LIQUORS in the United States (Table No. 20) employed 1,138 distilleries, independent of a large number of rectifying establishments, the product of the former being over eighty-eight millions of gallons, of the value of \$24,253,176. The middle and western States were the largest producers, the latter yielding nearly forty-five and the former thirty-seven millions of gallons of whisky, high wines, and alcohol, the aggregate value in each section being almost eleven millions of dollars. It is satisfactory to observe, that more than ninety-five per cent. of all the spirits made, was from materials of domestic production, a little over four million gallons of New England rum having been the product of imported molasses.

The manufacture of MALT LIQUORS, (Table No. 21,) though of less magnitude, and far less pernicious in its effects, shows a still larger increase. It derives its material wholly from agriculture, and its extension promises more substantial benefits to the country than the last.

The northern States returned 969 breweries, or more than double the number in the Union in 1850. The quantity of all kinds of malt liquors made, including 855,803 barrels of lager beer, was 3,235,545 barrels—an increase of 175 per cent. upon the total product of 1850, while its value was returned at \$17,977,135, being more than three times the amount produced by breweries in that year. Nearly one-half of the whole quantity was made in New York and Pennsylvania. The former had 175 establishments—45 of them in the city of New York—and the latter State 172, of which Philadelphia contained 68. The manufacture of lager beer was much increased in all the middle and western States, about 41 per cent. of the whole being the product of the two States last named. Among the eastern States, Massachusetts, and among the western States, Ohio, Illinois, and Missouri, were the largest producers of malt liquors. There were 71 breweries in California and 8 in Oregon, producing together about 7 per cent. of the total value of the manufacture.

Among the great branches of pure manufacture in the United States, that of COTTON GOODS holds the first rank in respect to the value of the product and the amount of capital employed. Aided by the possession of the raw material as a product of our own soil, and by the enterprise and ingenuity of our people, this valuable industry has grown with a rapidity almost unrivalled.

The total value of cotton goods (Table No. 22) manufactured in New England was \$80,301,535, and in the middle States \$26,272,111—an increase of 83.4 per cent. in the former, and 77.7 in the latter. The remaining States produced to the value of \$8,564,280, making the whole production during that year

\$115,137,926, against \$65,501,687, the value of this branch in 1850, or an increase in the general business of nearly 76 per centum in ten years. In the States of Maine and New Jersey the manufacture increased in the same time 152 per cent.; in Pennsylvania, over 102 per cent.; in New Hampshire and Connecticut, over 87 per cent.; in Massachusetts nearly 69 per cent., and in Rhode Island 88.7 per cent. The total production in this branch was at the rate *per capita* of \$3 69 for every individual in the Union, equivalent to $46\frac{1}{2}$ yards of cloth for each, at the medium price of 8 cents per yard. The average product per head in 1850 was $32\frac{1}{4}$ yards. The increase alone has, therefore, been at the rate of 11 yards for each person, or nearly equal to the average annual consumption *per capita* in 1830, when it was estimated to amount to twelve yards. The number of hands employed in the manufacture in 1860 was 45,315 males, and 73,605 females, an increase in the male operatives of 10,020, and in the female of 10,944 since 1850. The average product of the labor of each operative was \$969. The number of spindles was returned at 5,035,798, being an increase of 1,402,105, or 38.5 per cent. over the aggregate in 1850, which was estimated at 3,633,693. The New England States possess 3,959,297, or 78.6 per cent. of the whole, while Massachusetts alone employs 1,739,700, or 29.3 per cent. of the number returned in the Union. The increase of spindles in the last decade was, in New England, 1,208,219, or 30 per cent. In the State of Maine, 186,100, or 163.3 per cent.; in the State of New Hampshire, 229,484, or 52.1 per cent.; in the State of Massachusetts, 451,609, or 35 per cent.; in the State of Rhode Island, 141,862, or 22.7 per cent.; in the State of Connecticut, 211,188, or 83.1 per cent.; while in Vermont it exhibited a decrease.

The product per spindle varies in the different States, partly accounted for by the fact that many manufacturers purchase yarns which have been spun in other States.

The product of cotton goods per spindle is as follows: In Maine, \$22 12; Massachusetts, \$21 12; New Hampshire, \$24 87; Vermont, \$18 13; Rhode Island, \$16; Connecticut, \$16 46. The average in the New England States is \$20 30; in the middle States, \$30 48, and in the whole Union, \$22 86.

The quantity of cotton used in the fabrication of the above goods was 364,036,123 pounds, or 910,090 bales of 400 pounds each. Of this amount the New England States consumed 611,738 bales, and Massachusetts alone 316,665. The consumption per spindle in that year in the various States and sections was as follows:

	No. of spindles.	Pounds of cotton.	Pounds per spindle.
Maine.....	300,000	23,438,723	78
New Hampshire	660,885	39,212,644	58.5
Vermont	19,712	1,057,250	53
Massachusetts	1,739,700	125,665,080	72.2
Rhode Island	766,000	33,521,608	50 2
Connecticut	464,000	15,799,140	34
In New England.....	3,959,297	237,844,854	61 8
In the Middle States	881,661	76,055,666	88.26
In the United States	5,035,798	364,036,123	72 2

When we consider the large number of hands, and especially of women and children, who find employment in this business, the quantity of raw material, of machinery and of fuel, exclusively of American production, employed in this branch, and the amount of comfortable clothing and household stuffs supplied

at cheap rates, or the amount it contributes to the internal and foreign commerce of the Union—its progressive increase is a subject of the highest satisfaction, and its growth both here and abroad is one of the marvels of the nineteenth century.

The returns of WOOLLEN MANUFACTURES (Table No. 23) show an increase of over fifty-one per cent. in ten years. The value of woollen and mixed goods made in 1850 was \$45,281,764. In 1860 it amounted to \$68,865,963. The establishments numbered 1,909, of which 453 were in New England, 748 in the middle, 479 in the western, 2 in the Pacific, and 227 in the southern States. The aggregate capital invested in the business was \$35,520,527, and it employed 28,780 male and 20,120 female hands, 639,700 spindles, and 16,075 looms, which worked up more than eighty million pounds of wool, the value of which, with other raw materials, was \$40,360,300. The foregoing figures include satinets, Kentucky jeans, and other fabrics of which the warp is cotton, though usually classed with woollens. In the manufacture of these mixed goods the amount of cotton consumed is 16,008,625 pounds, which, with 364,036,123 pounds used in making cotton goods, as previously stated, amounts to 380,044,748 pounds, or 950,112 bales, exclusive of a considerable quantity used, annually, in household manufactures, and for various other purposes.

The largest amount of woollens was made in New England, where the capital was nearly twenty millions of dollars, and the value of the product \$38,509,080, but little less than the total value in 1850. More than half the capital, and nearly one-half of the product of New England belonged to Massachusetts, which had 131 factories of large size. Rhode Island ranked next, and had increased its manufacture 163 per cent. in ten years, that of Massachusetts being 48 per cent. The value of woollens produced in the middle States was \$24,100,488, in the western \$3,718,092, and in the Pacific and southern \$2,538,303. The sectional increase was, in New England 52.1, in the middle States 54, and in the south 107—the last showing the greatest relative increase. Pennsylvania, next to Massachusetts, was the largest producer, having 447 factories, which made \$12,744,373 worth of woollen and mixed fabrics, an increase of 120 per cent. A value of \$8,919,019 was the product of 222 establishments in the city of Philadelphia.

The State of New York holds the third rank in relation to this industry, its manufactures amounting to more than nine millions of dollars. The woollen manufactures of Maryland exhibit an increase of 86 per cent. In Ohio, which produced in 1850 a greater value of woollens than all the other western States, there was a decrease on the product of 1850, owing, probably, to the shipments of wool to Europe, which, in 1857, was found to be the most profitable disposition of the rapidly increasing wool crops of that State. In Kentucky, now the largest manufacturer of wool in the west, the product was \$1,128,882, and the increase in ten years 40.4 per cent.; while in Indiana, which ranks next, it was 31 per cent., and in Missouri 18.8, on the product of 1850.

The extension of this important manufacture is a subject of great interest to the country, inasmuch as our climate renders woollen clothing necessary throughout a large part of the Union during much of the year; and because it would supply the best market to the wool-grower.

The quantity of wool returned for the whole Union in 1850 was upwards of fifty-two and a half millions of pounds. Sheep raising has been greatly extended and improved since that date in Ohio, Texas, California, and other States, and the clip in 1860 amounted to 60,511,343 pounds, an increase of 15.2 per cent. in ten years. The yield still falls far short of the consumption, and large quantities continue to be imported, notwithstanding the amount of territory adapted to sheep husbandry.

The manufacture of LINEN GOODS has made but little progress in this country. A few mills, chiefly in Massachusetts, make crash and other coarse fabrics;

the largest two in that State produced six million yards in 1860. Others are extensively engaged in making twines, shoe and other threads. It is to be regretted that the manufacture of flax has not attained greater magnitude in a country where the raw material is so easily and cheaply grown. Farmers throughout the west have raised the crop simply for the seed, and thrown out the fibre as valueless.

The manufacture of fabrics from **FLAX COTTON** has been commenced, and success in a new branch of industry is confidently expected. The inventive genius of our countrymen has perfected machinery for the preparation of flax for spinning, which can be furnished, it is alleged, at as low a rate as the product of southern cotton fields.

The manufacture of **SEWING SILKS** is extensively carried on in this country. Including tram, organzine, &c., the production exceeded five million dollars in the States of Connecticut, New Jersey, Massachusetts, Pennsylvania, and New York—their relative values being in the order mentioned. Ribbons are made to a small extent, but the chief manufactures of silk consist of ladies dress trimmings, coach lace, &c., of which the cities of Philadelphia and New York produce to the value of \$1,260,725 and \$796,682, respectively.

The production of **LEATHER** (Table No. 24) is also a leading industry of much importance to the agriculturist and stock raiser, as well as to the commercial interest, inasmuch as it consumes all the material supplied by the former, and feeds an active branch of our foreign import trade. The tanning and currying establishments of the United States produced in 1850 leather, exclusive of Morocco and patent leather, to the value of \$37,702,333. The product of the same branch in 1860 reached \$63,090,751, an increase of nearly 67 per centum. In the New England States it was \$16,333,871, in the Middle States, \$36,344,548, and in the Western States, \$5,986,457; being an increase 66.6 per cent., 90.7 and 13.3 in those sections, respectively. The Pacific States and Territories, (including Utah,) which returned no leather in 1850, produced in 1860 to the value of \$351,469. The largest producers of leather are New York, \$20,758,017; Pennsylvania, \$12,491,631; and Massachusetts, \$10,354,056; an increase in those States of 111.7, 98.4, and 82.3 per cent., respectively. Including Morocco and patent leather the aggregate value produced in the Union in 1860 exceeded sixty-seven millions of dollars.

If we add to the sum total of this manufacture the aggregate value of all the allied branches into which it enters as a raw material, or take an account of the capital, the number of hands, and the cost of labor and material employed in the creation and distribution of its ultimate products, it is doubtful if any other department of industry is entitled to precedence over that of leather.

The manufacture of **BOOTS and SHOES** (Table No. 25) employs a larger number of operatives than any other single branch of American industry. The census of 1850 showed that there were 11,305 establishments, with a capital of nearly thirteen millions of dollars, engaged in making boots and shoes to the value of \$53,967,408, and employing 72,305 male and 32,948 female hands. The returns of 1860 show that 2,554 establishments in the New England States employed a capital only \$2,516 less than that of the whole Union at the former date; and with 56,039 male and 24,978 female employes produced boots and shoes of the value of \$54,767,077 or eight hundred thousand dollars more than the entire value of the business in 1850, and 82.8 per centum in excess of their own production in that year. Massachusetts increased 92.6 per cent., having made boots and shoes of the value of \$46,440,209, equal to 86.6 per cent. of the general business in 1850. The State of New York returned 2,276 factories, with an aggregate production of \$10,878,797; and New England, New York, Pennsylvania, and New Jersey together produced \$75,674,946 worth of these articles, being 40.4 per cent. more than the product of all the States in 1850, and 67.9 per cent. more than their own manufacture in that year. The three

counties of Essex, Worcester, and Plymouth, in Massachusetts, produced boots and shoes to the value severally of about $14\frac{1}{2}$, $9\frac{1}{2}$, and $9\frac{1}{4}$ millions of dollars. The largest production of any one town was that of Philadelphia, in which it amounted to \$5,329,887; the next that of Lynn, Massachusetts, was \$4,867,399; the third, Haverhill, \$4,130,500; the fourth, New York city, \$3,869,068. The largest production of a single establishment was of one in North Brookfield, Massachusetts, and amounted to over \$750,000. This establishment was the largest of five the same proprietors had in operation that year, the total production whereof was over one million pairs of boots and shoes, valued at more than thirteen hundred thousand dollars! Machinery propelled by steam power is now used in many large manufactories with highly satisfactory results.

INDIA RUBBER GOODS were made chiefly in Connecticut, New York, New Jersey, and Massachusetts to the value of \$5,729,900, an increase of 90 per cent. in the last decade.

The value of CABINET FURNITURE (Table No. 26) made in 1860 in the New England, Middle and Western States reached the sum of \$22,701,304, an increase of 39.8 per cent. over the product of those States in 1850, and exceeding the production of the whole Union in 1850. New York returned in 1860 furniture of the value of \$7,175,060, (or 40.6 per cent. of the whole amount made in 1850.) Massachusetts, \$3,365,415, and Pennsylvania, \$2,938,503. The growth of this branch keeps pace with the increase of population and wealth, and serves to swell the amount of our exports. It gives employment at remunerative prices to skilled labor, which it attracts from the crowded labor-markets of Europe.

Our advance in wealth and refinement is attested by the rapid increase in the manufacture of piano fortes and other MUSICAL INSTRUMENTS, (Table No. 27.) New England, New York, and Pennsylvania produced musical instruments to the value of \$5,791,807; an increase of 150 per cent. over their own production in 1850, and 124 over the whole value of that branch in the Union in the same year. New York alone made \$3,392,577 worth, being \$811,862 more than the whole amount returned in 1850. In this branch, our manufacturers have achieved marked success. Without claiming for them superiority over their brethren in France and Germany, it is admitted that church organs and other instruments made in this country are better suited to the climate, and in other respects fully equal to those which come from the most celebrated establishments in Europe.

The increased amount of the precious metals and the greater ability of all classes to indulge the promptings of taste or luxury, have added greatly to the manufacture of JEWELRY, (Table No. 28,) and of all kinds of gold, silver, and plated wares. In the New England and Middle States, the production of jewelry and watches reaches over eleven millions in value; of silver, silver-plated wares, &c., over six and one-half millions; making nearly eighteen millions of dollars, exclusive of gold leaf and foil, and the assaying and refining the precious metals, exceeding the product of the whole Union, in 1850, by \$7,016,908 in value; an increase of over sixty-four per cent., and of seventy per cent. on the production of those States in that year. The production of cheap jewelry has been greatly augmented by recent improvements in electro-metallurgy.

The manufacture of American WATCHES, commenced within the last ten years in Boston as an experiment, has proved eminently successful. Unable, heretofore to compete with the low-priced labor of European workmen, our ingenious countrymen have perfected machinery, by the aid of which watch movements are fabricated equal, if not superior, to the hand-made. The continued growth of this branch will diminish the importation of foreign watches, and may, at no distant period, earn for our country a reputation in this manufacture equal to that she enjoys in the kindred branch of clock-making. Gold and silver watch cases are now produced to a very large extent, chiefly in the cities of Philadelphia, New York, and Newark.

Improvements in technical CHEMISTRY have added largely to the value of its products. The manufacture of articles strictly classed exclusive of white lead, ochres, paints, varnish, glue, perfumes, cement, pearl ashes, &c., amounted, in 1850, to the value of nearly five dollars. The production, in 1860, exhibited a considerable increase. This branch is susceptible of almost unlimited extension and application of commercial and useful articles from the refuse of every other industry and the diversified products, vegetable, animal, and mineral, of our lands. Many of the chemical branches, apart from the money value of their manufactures, are of the highest economical importance to our country as auxiliaries to almost every other industry of the people. Chemistry has revealed but a tithe of the vast wealth of its resources.

The manufacture and consumption of GAS, (Table No. 29,) for domestic and other purposes, which is one of the remarkable fruits of chemistry, has been greatly increased, not only in our northern cities, but in our towns and villages throughout the Union. The quantity returned in 1860, valued at a thousand million feet of the value of eleven million dollars, but the quantity made exceeded 5,000,000,000 cubic feet, the value of which is thirteen millions of dollars.

The making and refining of SALT (Table No. 30) in the United States in 1850 employed 340 establishments, and the value of their products was \$2,177,945. The four States of New York, Virginia, Ohio, and Pennsylvania, which, in the order named, are the principal salt-producing States, returned in 1860, according to the Eighth Census, nearly twelve million bushels, the cost of which was \$2,200,000, an average of about 18½ cents per bushel. Texas, Massachusetts, and California are also salt-producing States. About 60 per cent. of the whole was made in New York, at an average cost of 15 cents per bushel.

In the aggregate product of the FISHERIES (Table No. 31) there was an increase of 28.5 per cent. over their value in 1850. The total value of the lake, river, shore, and deep-sea fisheries, including oysters to the amount of \$382,170, and \$7,521,588 as the product of the whaling business, increased in 1860 to \$12,924,092. Of this amount \$6,526,238 in the whale and in the cod, mackerel, halibut, and other shore fisheries, belonged to the whaling and fishing industry of Massachusetts, and constituted nearly seventy-two per cent. of the whole. This favorite occupation of her enterprising sons has been for which has been over two and a quarter centuries engaged in the principal distributing fish market of the Union, and has raised the State to the third rank among New England seaports in the amount of her foreign commerce. The latter has become the largest seat of the whaling industry in the United States, if not in the world, and distributes the product to the large cities of the Union and to foreign countries.

The State of Maine holds the second place in respect to the value of her fisheries, and returned \$1,050,755 as the value of the cod, mackerel, and other fisheries taken by its fishermen. North Carolina had the largest shad fishery in value to \$99,768. New Jersey, New York, and Virginia took the largest amount of oysters, and Michigan returned the largest value in 1860 amounting to \$250,467.

A slight decline in the value of the whale fishery arose from the scarcity of the whale in its former haunts. The consequent deficiency of teeth, and oil, as raw materials, proved embarrassing to some branches of the fishery, particularly those employing whalebone. The scarcity of whale fish oils in the arts has been supplied by an increased production of fish oils, especially by that beneficent law of compensation which pervades the operations of nature, and when one provision fails her children, opens to them the exhaustless storehouse of her material resources, or leads out

energies upon new paths of discovery for the supply of their own wants. Thus, when mankind was about to emerge from the simplicity of the primitive and pastoral ages, the more soft and fusible metals no longer sufficed for the artificer, and veins of iron ore revealed their wealth and use in the supply of his more artificial wants, and became potent agents of his future progress. When the elaboration of the metals and other igneous arts were fast sweeping the forests from the earth, the exhaustless treasures of fossil fuel, stored for his future use, were disclosed to man, and when the artificial sources of oil seemed about to fail, a substitute was discovered flowing in almost perennial fountains from the depths of these same carboniferous strata. A decline of the cod and whale fisheries is, nevertheless, to be regretted, as they have been from the earliest period of our history the nurseries of seamen and of our naval and commercial marine, and therefore contributing to the national defence, to foreign commerce, ship-building, agriculture, and other important interests.

PETROLEUM.—An important development of the natural resources of the country, and a valuable addition to its exports, have been made by the discovery, within two or three years, that certain indications, known to the aboriginal and early European inhabitants of the western country, of natural reservoirs of inflammable oil existing upon the headwaters of the Alleghany river in New York and Pennsylvania, were but the clue to apparently inexhaustible supplies of native oil, accessible at no great depth throughout an extended belt of country, embracing the bituminous coal measures of several States.

Petroleum, rock, or mineral oil, a natural product of the decomposition of organic matter, emitted from the soil in various formations, particularly those of rock salt, was known and employed to some extent by the ancients, having been mentioned by the father of history twenty-three hundred years ago, and by Greek and Roman writers of later date. In its more fluid form, as found on the shores of the Caspian Sea, near the Irawaddy of Burmah, in Italy, and some parts of our country, it has borne the name of naptla, while the more solid elements of the same substance predominated in the articles known as asphaltum and bitumen, found abundantly in the Great Pitch Lake of the Island of Trinidad, near the Dead Sea in Judea, and elsewhere. Petroleum is nearly identical in properties with the artificial oils, which have been long derived from the destructive distillation of different minerals, as cannel coal and brown coal, or lignite, bituminous shales, sands, clays, peat, &c., which have been the subject of numerous patents in Europe and America, and within the last eight years have been manufactured to a considerable extent in the United States and the neighboring provinces, until the native petroleum springs opened a source of cheaper supply.

As a product of our own country this remarkable substance was brought to the notice of the white population, as early as the middle of the last century, by the Seneca Indians, who found it upon Oil creek, a branch of the Alleghany, in Venango county, Pennsylvania, and near the head of the Genesee river, in New York, whence it received the name of "Seneca oil" and "Genesee oil." It was used by the natives in their religious ceremonies, and as medicament for wounds, &c. For the last-named purpose it has been long collected and sold in small quantities at a high price. A perennial flow of oil has been known to exist on Oil creek, above referred to, for a century. For the last forty years the spring has been enclosed in a vat or structure of wood and stones, which was daily skimmed by the proprietor and made the source of considerable revenue. We have seen extensive diggings in this region made by the French more than a century since, while that nation held the valley of the Mississippi, which were evidently made with a view to ascertain the basis or source of what, no doubt, impressed the French officers as a most interesting and curious development of the bounty of nature. Petroleum, doubtless, formed an article of considerable traffic between the Indians and traders of that region; as we have

seen, in some old account books of the last century, "gallons" and "kegs" of Seneca oil credited to Indians.

Its existence in any vast amount appears to have been unknown until 1845, when a spring was "struck," while boring for salt, near Tarentum, thirty-five miles above Pittsburg, on the Alleghany. Experiments having proved its constituents to be nearly the same as those of the artificial carbon oil, a company was organized in New York to attempt its purification by the same process applied to the latter. But little was effected, however, and in 1857 Messrs. Bowditch and Drake, of New Haven, commenced operations at Titusville, on Oil creek, where traces of early explorations were found, and in August, 1859, a fountain was reached by boring, at the depth of seventy-one feet, which yielded 400 gallons daily. Before the close of the year 1860, the number of wells and borings was estimated to be about two thousand, of which seventy-four of the larger ones were producing daily, by the aid of pumps, an aggregate of eleven hundred and sixty-five barrels of crude oil, worth, at twenty cents a gallon, about ten thousand dollars. Wells were soon after sunk to the depth of five or six hundred feet, and the flow of petroleum became so profuse that no less than 3,000 barrels were obtained in a day from a single well, the less productive ones yielding from fifteen to twenty barrels per diem. In several instances extraordinary means were found necessary to check and control the flow, which is now regulated in such wells according to the state of the market, by strong tubing and stop-cocks. The quantity sent to market by the Sunbury and Erie railroad from the Pennsylvania oil region, which has thus far been the principal source, increased from 325 barrels in 1859 to 134,927 barrels in 1861. The whole quantity shipped in the last-mentioned year was nearly 500,000 barrels. Since August, 1861, the product has rapidly increased. The present capacity of the wells is estimated at 250,000 to 300,000 barrels per week. So important, however, have the operations in this article become that a railroad, we understand, has been chartered in Pennsylvania exclusively for the transportation of the oil to market. From a recent number of the "Register," a newspaper published at Oil City, Pennsylvania, we copy the following statement respecting the product of petroleum in that vicinity: "We learn that the number of wells now flowing is seventy-five, the number of wells that formerly flowed and pumped is sixty-two; the number of wells sunk and commenced is three hundred and fifty-eight; total, four hundred and ninety-five. The amount of oil shipped is set down at 1,000,000 barrels; amount on hand to date, 92,450 barrels; present amount of daily flow, 5,717 barrels. The average value of the oil, at \$1 per barrel, is \$1,092,000; average cost of wells, at \$1,000 each, is \$495,000; machinery, building, &c., from \$500 to \$700 each, \$500,000. The total number of refiners is twenty-five. The detailed report of the condition of the wells shows that production is on the increase. Holders are firm at fifty cents per barrel at the wells, and don't seem to care about selling any great amount at that price." With increased facilities for getting it to the seaboard at a cheap rate for transportation, the operations will doubtless become much more extended than at present.

The exportation of crude and refined petroleum from the principal Atlantic cities to Europe, South America, and the West Indies, has already become considerable, the larger proportion being shipped to England. Much of it is sent to Europe in this crude state, in which form it is said to be preferred for the sake of the collateral products obtained in the process of refining. It is probable, however, that the highly inflammable character of the unrefined article, owing to the presence of certain gaseous or exceedingly volatile compounds may prove an objection to its shipment in that state.

The quantity exported from the cities of Philadelphia, New York, Boston, Baltimore, and San Francisco, from the 1st of January to the 1st of April, 1862, amounted to 2,342,042 gallons, valued at \$633,949. The receipts at Cincinnati,

during the same period, of carbon and petroleum oils, were 519,960 gallons, or 13,000 barrels, nearly one-half of which was petroleum oil. The exports from the three cities first mentioned, from the first of January to the 16th of May of the present year, were 3,651,130 gallons, worth \$889,886, and the shipments in the last week of that period from the same places, were 255,600 gallons, valued at \$42,160.

A large reduction has taken place in the price since the commencement of the trade, and particularly during the last few months. The price of crude petroleum in Philadelphia on the 4th January, 1862, was from 22½ to 23 cents a gallon, and of refined oil 37½ to 45 cents. On the 29th March the prices had declined at the same place to 10 and 12 cents for crude, and 25 to 32 cents for refined oil, while the most recent price current lists place it at 9 and 19 cents. Although the capacity of the existing wells already exceeds a profitable demand, there appears to be no assignable limit to the flow, or to the localities which may be found to yield it, whenever an augmented demand shall warrant farther search or increased production. The bituminous coal areas of the United States are estimated to cover upward of 62,000 square miles in eight of the middle, southern, and western States. Springs and reservoirs of petroleum have been discovered throughout nearly their whole extent. They have also been noticed by Captain Stansbury on a branch of the Yellow creek, 83 miles from Salt Lake City, in Utah, on the route to Fort Leavenworth. They exist also in some of the neighboring British provinces. It is probable that the saliferous strata of our western country may be generally found to yield this interesting mineral product.

The importance of this article is not limited to its value as an item in the export trade of our cities. Attention appears to have been first directed to it on account of the demand for a safe and cheap material for illumination, in place of the dangerous compounds of turpentine and other explosive hydro-carbons, as well as for lubricating purposes in which it has proved to be a valuable substitute for animal oils. There is no doubt that the various other uses of crude petroleum, or its constituents, will render it a valuable acquisition to the arts. The business of refining the raw product, in order to remove from it all corrosive and volatile elements, already employs a number of establishments, and will become one of some magnitude. Practical chemistry is daily adding to the number and variety of uses which the substances eliminated in the process of rectification may be made to subserve in the arts.

Although the extraction of oil, pitch, and tar from bituminous shale was the subject of a patent in England as early as 1695, and the manufacture and purification of oil, gas, and other hydro-carbons from coal received several improvements by the Earl of Dundonald and others at a later period, the patent of Mr. Young, of Manchester, secured in England in 1850, and in the United States in 1852, "for the obtaining of paraffine oil, or an oil containing paraffine, and paraffine from bituminous coal," appears to have given the first great impulse to the manufacturing of these oils as a source of artificial light. The patent, which covered a very successful process, has given rise to suits at law, one of which was recently brought, without success, to restrain the sale in England of petroleum oils, by the name of American paraffine oil, as damaging to the sale of his "paraffine oil," on account of the highly inflammable character of the former.

Illuminating oil from coal appears to have been made as early as 1846 by Dr. Gesner, of Nova Scotia, and in 1854 the Kerosene Oil Company, on Long Island, commenced the first manufacture of carbo-hydrogen oil under patents secured by Dr. Gesner, using cannel coal from England, New York, and other parts of the United States. The Breckenridge coal-oil works on the Ohio, at Cloverport, Kentucky, were commenced in 1856, and were soon followed by others, to the number of twenty-five in operation in 1860 in Ohio alone, with a working capacity of three hundred gallons of light oil each, per diem. There were then about fifty-six factories in the United States, exclusive of some fifteen

engaged altogether on petroleum, and several small private coal-oil works. The capital expended in coal-oil works and cannel coal mines was estimated at nearly four million dollars. The manufacture of coal-oil lamps, resulting from the use of the oil, formed the principal business of sixteen companies, who employed 2,150 men and 400 women and boys, and work for 125 looms in making the lamp-wick.

The cannel coal employed by them, as well as wood, peat, and other substances of vegetable origin, when subjected to destructive distillation in close vessels, at a heat below that at which they yield gas in abundance, affords a large quantity of a light supernatant oil, amounting to about one-fifth of the product, which, having been purified and re-distilled, yields a very volatile and naphthalous fluid, of light specific gravity, containing some paraffine oil, and highly inflammable, owing to the presence of benzoïn or benzole. There is also obtained a heavier oil, which is a safe and valuable burning oil, a denser lubricating oil, and solid paraffine, a peculiar white crystalline substance, beautifully adapted for candles, and now manufactured to some extent for that and other practical uses. The petroleum of our country has been found to be a more economical source for these several compounds of carbon and hydrogen, and enables the manufacturer to dispense with the first stage of the process referred to. The cheapness of crude petroleum, and the simple and comparatively unexpensive process by which a safe and economical illuminating oil may be obtained, give an unusual interest to this subject, as affording the means of preventing the great loss of life shown by the recent census to result from the dangerous compounds so extensively used for that purpose. Although the petroleum oils, when imperfectly rectified, so that all the benzole has not been expelled, are exceedingly explosive, owing to the heat generated by the combustion of the solid paraffine readily vaporizing and igniting the more ethereal portion, it may with great facility be freed from all volatile substances, and a very simple and practical test enables the purchaser to ascertain its fitness for use. The precautions required in the treatment of petroleum, as well as the expense of thoroughly purifying it, being somewhat greater than with coal oils, many are tempted to neglect it or even to add a portion of the lighter and cheaper oil to make the heavy oil burn more readily.

All these oils possess an advantage over other kinds in the fact, that when once properly deodorized, they do not become rancid or ferment by keeping, but rather lose by age any odor they may have retained.

Of eight several products obtained from petroleum by chemical analysis, two or three only were solidified by cold of fifteen degrees below zero, the first three or four remaining perfectly fluid, and none possessed corrosive qualities, showing their fitness as lubricators. Experiments have shown that crude petroleum is admirably adapted to the manufacture of gas, and have led to the expectation that its use will greatly reduce the cost of its manufacture, if it does not entirely supersede the use of coal for that purpose. The "carburation of gas," by attaching to the gas-burner a reservoir of oil, through which the gas is made to pass before combustion, has been found greatly to increase the economy and illuminating power of coal-gas.

The various collateral and residuary products of the distillation, which have been generally wasted heretofore, will all doubtless be utilized as the progress in analytical and technical chemistry throws more light upon their nature and relations. Several of them are already employed in Europe, if not in this country, in the manufacture of some of the new and beautiful dyes which practical science has recently introduced in the arts. Benzine, which it is the object of the rectifier to eliminate, is used, to some extent, as a flavoring material, though some recent facts make it doubtful if it is wholly innocuous to the health.

The acids, caustic alkalies, and other materials used in the purification of the crude qualities of petroleum may all be restored to use or employed as fertilizers, and the dense, pitchy liquids obtained in the manufacture are available in

the composition of water-proof cements, roofing, varnish, and fuel. The absence of fatty acids may possibly prevent the saponification of these oils with alkalis for the manufacture of soap, but the more extended use of petroleum for the purposes we have named, which will be effected by time and improved manipulations of the article, will suffice to render it a most valuable acquisition to the raw materials and manufactures of the country.

Having partially reviewed the progressive industry of our country during the last decade, and seen the advancement in all that relates to the peaceful arts, the numerous improvements made in the implements and enginery of warfare, which are patent and undeniable, deserve consideration. Our improved fire-arms, especially rifles and pistols, have obtained a reputation not alone in Europe, but in Africa, Asia, and the islands of the sea, the traveller finds that his revolvers of American invention and manufacture exert a salutary influence on the Bedouin and the robber.

The machinery for making the various parts of rifles and other fire-arms, which, in its automatic exercise, seems almost endowed with reasoning faculties, owes its origin to the inventive genius of New England. The Enfield rifle was transplanted to England by a son of Vermont, under whose superintendence the arms were made. And even the Armstrong gun, which obtained for its reputed inventor the honor of knighthood, was invented in this country, for a model was submitted and the principle demonstrated to scientific gentlemen at Harvard College anterior to its appearance in Great Britain. (See notes.)

In the year preceding June 1, 1860, a year devoted to peaceful pursuits, the manufacture of fire-arms was limited, and yet two establishments in a single city of Connecticut produced to the value of over one million of dollars. Had the national inventory been taken two years later, the magnitude of this and kindred branches of manufacture, stimulated by the necessities of the country, would have excited astonishment. (See note on fire-arms, p. 118.)

Without any special stimulus to growth—depressed, indeed, during the years 1857 and 1858, in common with other public interests, by the general financial embarrassments of those years,—and with a powerful competition in the amazing growth of manufactures in Great Britain and nearly every other nation of Europe, the manufactories of the United States had nevertheless been augmented, diversified, and perfected in nearly every branch, and almost uniformly throughout the Union. Domestic materials, whether animal, vegetable, or mineral, found ready sales at remunerative prices, and were increased in amount with the demand, while commerce and internal trade were invigorated by the distribution of both raw and manufactured products. Invention was stimulated and rewarded. Labor and capital found ample and profitable employment, and new and unexpected fields were opened for each. Agriculture furnished food and materials at moderate cost, and the skill of our artizans cheapened and multiplied all artificial instruments of comfort and happiness for the people. Even the more purely agricultural States of the south were rapidly creating manufactories for the improvement of their great staples and their abundant natural resources. The nation seemed speedily approaching a period of complete independence in respect to the products of skilled labor, and national security and happiness seemed about to be insured by the harmonious development of all the great interests of the people. Peace reigned within our borders and waited upon our name abroad. But in an evil hour the tide of prosperity has been stayed, whether to be rolled back or not, the ninth census will reveal.

BANKS AND INSURANCE.

(APPENDIX—TABLE NO. 34.)

* Among the evidences of prosperity and general accumulation of wealth in the United States, the multiplication of banks with increased aggregate capital is

one of the most significant. When, as in this country has been generally the case, individual promises representing produce and merchandize, and made available through the instrumentality of banks, are almost the sole means by which commodities pass from the producers to the consumers, the increased action of the banks becomes the index of larger production and more active trade. Where crops and the products of manufacturing industry are more abundant, the aggregate amount of paper created by their interchange is larger, and the negotiations of this paper require greater banking facilities. This want usually manifests itself in a more lucrative banking business, which draws more capital into that employment. Such a state of affairs presented itself during the decade which closed with 1860. The bank movement in the United States during that period underwent great expansion without becoming less sound. In that respect it presented a strong contrast to the expansion that occurred in the decade which ended with 1840. In that period a season of speculation in bank stocks and wild lands manifested itself, and the paper created for bank negotiation represented imaginary or speculative values rather than commodities produced. Those values were never realized, and the whole paper system based on them collapsed. If we compare the aggregate features of the banks at each decade with the population and the sum of the imports and exports for corresponding dates, the results are as follows:

Years.	No. of banks.	Capital.	Loans.	Specie.	Circulation.	Import & export.	Population.
1830..	330	\$145,192,268	\$20,461,214	\$22,114,917	\$61,323,898	\$144,726,428	12,866,020
1840....	901	353,442,692	462,896,523	33,105,153	106,968,572	239,227,465	17,069,453
1843....	691	228,661,948	254,544,937	33,505,866	58,563,608	149,090,279
1850....	672	227,463,074	412,607,653	48,677,138	155,012,911	330,037,038	23,191,876
1860....	1,562	421,620,095	691,945,560	83,594,537	207,102,477	762,288,550	31,445,920

The year 1843 was that of the lowest depression after the extensive liquidation that followed the expansions of 1837-'39. In that year the bank credits were, however, large, as measured by the foreign trade or the sum of the imports and exports, but an internal trade had been developed through the settlements of the western country which required more credits. The operation of the general bankrupt law aided in clearing away the wreck of over two hundred banks that had failed, and which failures involved that of several sovereign States that had loaned their credits for bank capital.

The elements of prosperity were now again active, and banking facilities were required to a greater extent. The severe losses the public had suffered made some more comprehensive guarantee necessary to a full restoration of confidence in bank paper. In New York, in 1838, a new principle had been adopted—that of requiring the banks to deposit security for their circulating notes and holding stockholders liable to an amount equal to the value of their shares. On this basis the banking of New York was thenceforth to operate; and the principle, as its value became recognized, was gradually adopted in other States.

The failure of the Irish harvests of 1846-'47, followed by those of England in 1848-'49 by creating a great demand for American breadstuffs, stimulated business and gave a new impulse to banking. The year 1850 showed an amount of foreign trade more than double that of 1843. With the increase of business the banks were very prosperous, as is manifest in the fact, that although the capital of the banks was no more in that year than in 1843, their discounts were one hundred and fifty millions, or 60 per cent. greater. Thus the decade opened with a very lucrative banking business, and amid the greatest excitement in relation to the gold discoveries of California. The spirit of enterprise abroad was very strong, and the impression that prices were to rise by reason of the

depreciation of gold was prevalent; hence the general desire to operate, in order to avail of the anticipated profits. Industry of all descriptions was very active and productive, and there never was a period when the national capital accumulated so fast, a remarkable evidence of which was afforded in the vast amount expended in the construction of railroads; while, of the large capital accumulated, a considerable portion was employed in banking. The incorporated bank capital increased nearly two hundred millions, and the private bank capital half as much. The report of the Treasury Department gave the latter amount at \$118,036,080. The distribution of the incorporated banks among the several States is given in the Appendix, (Table No. 33.)

The increase of bank capital was large in the Atlantic cities, particularly in Boston and New York, of which the number and capital were respectively as follows:

	1850.		1860.		Increase.	
	No.	Capital.	No.	Capital.	No.	Capital
Boston.....	30	\$31,760,000	43	\$36,581,700	12	\$14,821,700
New York.....	31	33,600,602	55	69,758,777	24	36,158,175
Total of two cities.....	61	55,360,602	97	106,340,477	36	50,979,875

This increase of banks, following the general expansion of business, brought with it the necessity of some improved means of adjusting the daily mutual balances. The fifty-five banks in New York city, for example, were each compelled to settle as many accounts daily. To obviate that great labor the clearing system was devised. Each bank sends every morning to the clearing-house all the checks and demands it may have received the day previous, in the course of business, upon all others. These in a short time are interchanged, and a balance struck and paid. This system was established in 1853, and the amount of the exchanges and balances annually were as follows:

Year.	Amount exchanged.	Balances.
1854.....	\$5,750,455,927 06	\$297,411,493
1855.....	5,352,913,098 33	229,694,137
1856.....	6,936,213,328 47	334,714,489
1857.....	8,333,226,718 66	365,313,901
1858.....	4,756,664,386 09	314,238,910
1859.....	6,448,005,956 01	363,984,682
1860.....	7,231,143,056 69	308,683,438
1861.....	5,915,742,758 05	353,383,944
Total for eight years.....	50,704,365,288 81	2,627,494,997

With the development of business the transactions grew immensely up to 1858, when they fell off nearly one-half under the panic of that year. They recovered gradually up to the breaking out of the rebellion. The banks of Boston and Philadelphia adopted the same system with similar results. The figures indicate to what an extent the credits of individuals, created in the operations of business, are cancelled through the intervention of the banks of the cities where the commerce of the whole country centralizes.

In the States of Illinois, Mississippi, Arkansas and Florida, after the collapse of 1837, no banks were again created up to 1850, and the three last named are

still without them, with the exception of two small ones in Florida. Texas has a small bank at Galveston, and Utah, Oregon, and New Mexico have none. In the District of Columbia four old banks expired by limitation of charter in the hands of trustees, and Congress refused to recharter them; but they continue to transact business.

It is probable that a large portion of the increase in banking, particularly at the west, has been due to the introduction of the security system of New York, the idea of which seemed to popularize that which had previously been in bad odor. The following table shows the States which have adopted the free banking principle in whole or in part:

States.	Year adopted.	1860.	
		Stocks held.	Circulation.
New York.....	1838	\$26,807,874	\$29,959,506
Michigan.....	1849	102,831	222,197
New Jersey.....	1850	962,911	4,811,632
Virginia.....	1851	3,584,078	9,812,197
Illinois.....	1851	9,826,691	8,981,723
Ohio.....	1851	2,153,552	7,983,889
Indiana.....	1852	1,349,466	5,390,246
Wisconsin.....	1854	5,031,504	4,429,655
Missouri.....	1856	725,670	7,884,825
Tennessee.....	1852	1,233,432	5,538,378
Louisiana.....	1853	5,842,096	11,578,313
Iowa.....	1858	101,840	568,806
Minnesota.....	1858	50,000	50,000
Massachusetts.....	1859
Total.....	57,951,954	97,212,827

The principle cannot be said to have worked well except in New York, where it required constant alterations for many years to bring it to perfection. In Illinois it was an entire failure, and the new constitutional convention adopted a clause looking to the prohibition of any more banks and to the suppression of the existing circulation.

INSURANCE.

The progress of insurance in the United States has been rapidly following the development of commerce and trade, of which it is the necessary accompaniment, since the system of buying and selling goods on credit necessitates the resort to every possible means of making those credits safe. None is more obvious than that of requiring all goods to be insured. It follows that as commodities increase in quantity and value, the amount to be covered by insurance must expand in the same proportion. Unfortunately, however, there have been no regular statistics collated from year to year, as in the case of banks, by which that interesting index to the growth of the national wealth might be compared. The State of Massachusetts has paid most attention to this matter, and the annual reports are very valuable. The number of companies and amounts at risk have been as follows in that State:

Year.	Number of companies.	Capital stock.	Fire risks.	Marine risks.
1840.....	41	\$7,475,000	\$51,898,596	\$50,631,877
1850.....	30	6,106,875	63,943,273	76,082,529
1860.....	117	6,353,100	348,923,289	101,972,974

The total property at risk has increased in the ten years \$310,870,461. Under the present laws of New York the insurance returns are well organized. Taking the figures in connexion with those of the leading ones of other States, the results are as follows :

	Number of companies.	Capital and assets.	At risk.
New York	135	\$53,287,547	\$916,474,956
Massachusetts	117	6,353,100	450,696,263
Connecticut	12	5,364,688	279,522,184
Rhode Island	6	2,419,688	32,187,104
Philadelphia	10	6,519,601	139,239,374
New Orleans	9	6,738,031	221,100,000
Charleston	2	47,291,000
Augusta, Georgia	1	952,858	7,000,000
Jersey City	1	179,713	5,231,061
Peoria, Illinois	1	363,995	6,606,377
Total			2,105,538,319

The amount at risk by all the companies in the Union may approach three thousand millions, and the losses were reported as follows for 1860 :

Vessels and freights	\$13,525,000
Cargoes	15,050,700
Total marine	28,575,700
By fire	22,020,000
Total losses	50,595,700

The number of United States life insurance companies is about 47; number of lives insured, 60,000; total amount insured, \$180,000,000; annual premiums, \$7,000,000.

VALUE OF REAL AND PERSONAL ESTATE.

(APPENDIX—TABLE No. 35.)

The marshals of the United States were directed to obtain from the records of the States and Territories respectively, an account of the value of real and personal estate as assessed for taxation. Instructions were given these officers to add the proper amount to the assessment, so that the return should represent as well the true or intrinsic value as the inadequate sum generally attached to property for taxable purposes. The result of this return by all the census takers will be found in table No. 34, whereby it will appear that the value of individual property in the States and territories exceeds the sum of sixteen thousand millions of dollars, representing an increase of one hundred and twenty-six and a half per centum in ten years in value in the aggregate, and an increase of sixty-eight per cent. per capita of the free population. The rate of increase has been immense in the western States, while the absolute gain in the older States has been no less remarkable. For example, the rate of increase in Iowa has been more than nine hundred per cent., while the absolute increase of wealth has been two hundred and forty-seven millions of dollars; while Pennsylvania has increased at the rate of ninety-six per cent., with an absolute gain in wealth of near seven thousand millions of dollars. The wealth per capita for Iowa in 1850 was \$123, while in 1860 it amounted to \$366, a rate of increase

of one hundred and ninety-seven and a half per cent. The wealth of Pennsylvania in 1850 per capita was \$312; in 1860 per capita was \$487; the rate of increase fifty-six per cent.

It must be borne in mind that the value of all taxable property was returned, including that of foreigners as well as natives, while all was omitted belonging to the States or United States. In considering the relation of population to wealth, the fact must be borne in mind that a much larger proportion of the property of the western than eastern States is held by non-residents, and that this circumstance is not without its influence in exaggerating the wealth of individuals in States where large investments have been made by persons resident elsewhere.

The effect of internal improvements upon the prosperity and wealth of the country can not be better illustrated than by the rapid enhancement in value of all property brought within their influence.

To trace the causes of our great progress in wealth, and to pursue the investigation in detail, would be profitable and interesting, but the want of time makes it incumbent to postpone further review of this table to another time.

AGRICULTURE.

(APPENDIX—TABLE NO. 36.)

View of the condition and progress of agriculture in the United States.

It appears from the returns of the last census, that the ratio of increase of the principal agricultural products of the United States has more than kept pace with the increase of population. Indeed, there appears no reason to doubt the continuance of an abundant supply of all the great staple articles, equal to the necessities of any possible increase of population or national contingency for ages to come. It is also gratifying to note the evidences of improvement in some of the most important agricultural operations, proving that our farmers are fully in sympathy with the progressive spirit of the age, and not behind their fellow-citizens engaged in other industrial occupations. The products of the great west are giving a tone to the markets of Great Britain and the continent. Chicago has become one of the first grain markets in the world, and as the boundless region still further west is being developed, every channel of communication with the Atlantic coast will teem with the products of the soil. Illinois alone sends now to the great market at New York an average of two thousand head of cattle weekly, and other States, comprising regions almost unknown at the former census, and still more distant from the seaboard, are adding and increasing their contributions.

New plants and animals have been introduced in the past decade. From the products of the sugar cane—*sorghum saccharatum*—transplanted from the Chinese empire, the west is furnished with a new article of domestic luxury and utility, and rendered comparatively independent of the sugar cane of more southern States.

The great dairy interest in our country during this period has increased the production of cheese and butter, and already American cheese is as well known in English markets as the best English dairy cheese.

Indian corn is now an indispensable article for Great Britain, and each succeeding year is increasing the demand for this important product of our country, which is raised in every State and Territory of our Union.

While it is admitted that very much remains to be accomplished by the agricultural interest of our country, it cannot be doubted that the past ten years has shown to the world that the United States has within its own territory the resources which will enable us to compete with the older nations of the world in every department of domestic industry.

The London exhibition in 1851 made known that the United States had the

means of supplying the implements and machinery needed in every country in Europe. Since that time our reapers and mowers, ploughs, steam-engines, and railroad cars have found their way to the Old World, and an American in taking the tour of the continent will, in the great empire of Russia, find himself on board of an American railroad car drawn by an American locomotive on a railroad built by an American engineer. We point to these advances as evidence that the enterprise of our countrymen, with so wide a scope for its development at home, manifests itself wherever a profitable field opens for its exercise abroad.

At a period like the present, when, for the preservation of the national life and character, the resources of the country are subjected to a greater strain than they have ever yet borne, when a large portion of its effective labor is diverted to the same sacred duty, and all the productive forces of the Union are controlled to an unprecedented extent by causes more pervading and subversive in their effects than any which could possibly arise from extraneous sources, it is a subject of the highest gratification that we are blessed with the amplest returns from the labors of the husbandman. The crops of hay and grain, as the result of a favorable season and a broader cultivation of land, are believed especially to have afforded abundant and timely harvests. Regarded either as a source of cheap and ample supply for a vast commissariat with the least possible drain upon the public chest, of cheap and plenary subsistence to the numerous unemployed and dependent classes, or as a source of exports and employment for the commercial and shipping interests, the bounty of our land is at the present time a subject of national congratulation and thankfulness.

The increasing annual products of agriculture in our highly-favored country, and the hay and grain crops in particular, furnish striking illustrations of the close interdependence and connexion of all branches of the national industry. The dependence of agriculture upon the results of mechanical skill, as well as the astonishing progress of the latter within the last half century, is strongly exemplified in the application of labor-saving appliances, which become still more valuable, in emergencies like the present, in all the operations of the farm. The saving effected by new and improved implements in Great Britain within a dozen years preceding 1851 was stated by a competent authority to be not less than one-half on all the main branches of farm labor. Our own progress in this respect is believed to have been more rapid than that of any other agricultural people, and to be in advance of our application of the fruits of purely scientific research in the improvement of agriculture. In nearly every department of rural industry mechanical power has wrought a revolution. The inventive genius of the country has not only contrived to make it prepare the crop for market and to sew or knit the family apparel of the farmer, but to rock and "tend" the infant as well as to rend from the embrace of earth the century-rooted oak which our fathers were forced to leave to the slow eradication of time. Whether the superior agricultural advantages and the demand for improved implements and machinery in the United States have stimulated the facile ingenuity of our mechanics, or have only been seconded by its ready contributions to industry, we shall not stop to inquire. The greatest triumphs of mechanical skill in its application to agriculture are witnessed in the instruments adapted to the tillage, harvesting, and subsequent handling of the immense grain crops of the country, and particularly upon the western prairies. Without the improvements in ploughs and other implements of tillage which have been multiplied to an incredible extent, and are now apparently about to culminate in the steam plough, the vast wheat and corn crops of those fertile plains could not probably be raised. But were it possible to produce wheat upon the scale that it is now raised, much of the profit and not a little of the product would be lost were the farmer compelled to wait upon the slow process of the sickle, the cradle, and the hand-rake for securing it when ripe. The reaping-

machine, the harvester, and machines for threshing, winnowing, and cleaning his wheat for the market have become quite indispensable to every large grain grower. The commercial importance of the wheat crop and its various relations to the subject of domestic and foreign supply, to markets, the means of transportation, storage, &c., make it highly important that the producer shall have the means of putting his crop in the market at the earliest or most favorable time and with the greatest precision.

Wheat.—The quantity of wheat grown in all the States and Territories in the year 1849 was 100,485,944 bushels. The quantity grown in 1869 was 171,183,381 bushels, an increase of nearly seventy per centum, or about double the increase of population in the same period. Some of the older wheat-growing States—Pennsylvania, Virginia, New York, and Ohio—do not show a proportionate increase, owing to the destructive agency of the wheat midge, and the consequent unwillingness of farmers to subject themselves to repeated losses from this cause. Fortunately, the midge is diminishing where it was formerly most destructive, and wheat-growing will soon be resumed in many localities in these States where for a time it was almost abandoned. To the introduction and greatly extended cultivation of spring wheat in the northwestern States, is the country mainly indebted for the increase in the amount of wheat produced. In Illinois this crop has increased in ten years, from 9,414,577 bushels to 24,159,500 bushels; in Wisconsin, from 4,286,181 to 15,812,625 bushels in the same period. In many cases in these States the quantity grown has exceeded the means of ready transportation, or the demands of the market, and has therefore been too great to be profitable.

There appears among the contributions of the New York State Agricultural Society a statement of Dr. Asa Fitch, entomologist for that useful association, relating to depredatory insects, of so much general interest as to claim insertion in this report. It is a matter of no small import that this association have introduced into this country from abroad certain parasites which Providence has created to counteract the destructive powers of some of these depredators, by limiting their efficiency and destroying their numbers. We have heretofore been suffering from the destructive agency of some of these enemies to the grain crop, which have been introduced from abroad, without enjoying the influence of their natural enemies which remained at home. It is gratifying to realize that the New York State Agricultural Society has manifested a spirit so philanthropic in conception, with the prospect of results so important.

Dr. Fitch remarks:

“The grain aphid made its advent in a most remarkable manner. That an insect never seen before and not known to be present in our country should suddenly be found everywhere in New England, and most of the State of New York, in profuse numbers in every grain field of this wide extent of territory, and literally swarming upon and smothering the crop in many fields, was a phenomenon which probably has no parallel in the annals of science. How it was possible for this insect so suddenly to become thus astonishingly numerous was a mystery which seemed to most persons to be inexplicable. It is the most prolific of any insect which has ever been observed. I find it commences bearing when it is but three days old, and produces four young daily. Thus the descendants of a single aphid will in twenty days amount to upwards of two millions, each day increasing their number to almost double what they were the day before. This serves to account for the surprising numbers which we had of this insect.

“The aphid was everywhere supposed to be a new insect, and one writer went so far as to name and describe it scientifically, in full confidence that the world had never before known anything like it. My examinations, however, fully assured me that it was identical with a species which has long been known in the grain fields of Europe. And on my announcing this, the erroneous views which one and another were adopting were speedily abandoned.

“Our best European accounts of this insect are very imperfect. They only speak of it as occurring in June and July, whereas I find it is present on the grain the whole year round. And when the grain is but a few inches high, if half a dozen of these insects happen to locate themselves on the same plant they suck out its juice to such an extent that the plant withers and dies.

"As yet I have never been able to find a male of this species. They are all females. This is proved by placing any one supposed to be a male in a vial; next morning two or three young lice are always found in the vial with it. The general habits of insects of this kind are well known. The aphids on the apple tree and other fruit trees, when cold weather arrives, give birth to males. The sexes then pair, and the female thereupon deposits eggs, which remain through the winter to start these insects again the following year. I had supposed it would be the same with this aphid on the grain. I thought, when autumn arrived, I should meet with males and find eggs dropped on the blades of the grain. But there were none. The females and their young continued to appear on the grain till the end of the season. They are everywhere on the grain now, buried under the snow, ready to warm into life and activity again when the spring opens. And on grain growing in flower pots, on which I am keeping these insects in full activity through the winter to notice what I can of their habits, no males have yet appeared. When, and under what circumstances this sex will be produced, is a most curious subject, still remaining to be ascertained. It at present looks as though the female and their descendants were prolific permanently, without any intercourse of the sexes.

"Last summer such multitudes of parasites, ladybugs, and other destroyers of this aphid, had become gathered in the grain fields at harvest time that it seemed as though it would be exterminated by them. But at the end of the season this insect appeared as common on the young rye as I had noticed it at the opening of spring. The present indications, therefore, are that this aphid will be as numerous on the grain the coming summer as it was the past, if the season proves favorable to its increase.

"As to the *army worm*, it may be remarked that for almost a century it had been known that in this country was a kind of worm whose habit it was to suddenly appear in particular spots in such immense numbers as to wholly consume the herbage over an extent frequently of several miles, and then abruptly vanish, nothing being seen of it afterwards. Thus it was one of the most singular and also one of the most formidable and alarming creatures of this class that was known to be in our world. Yet, what kind of worm this was, and what insect produced it, remained wholly unknown down to the present day. Appearing here and there all over the country the past season, this army worm became an object of the deepest interest; and from Illinois on the one hand, and Massachusetts on the other, specimens of the moths bred from these worms were sent to me for information as to what the name of this insect really was.

"With regard to the *wheat midge*, I would observe that in this country injurious insects are much more numerous than in Europe, occasioning us far greater losses than are there experienced. A year ago I received from France a vial filled with insects as they were promiscuously gathered by the net in the wheat fields of a district where the midge was doing much injury. It then occurred to me that by gathering the insects of our wheat fields here in the same manner, it would furnish materials for a very accurate comparison of the wheat insects of this country with those of Europe. As the result of a comparison thus made, I find that in our wheat fields here the midge formed 59 per cent. of all the insects on this grain the past summer; whilst in France, the preceding summer, only seven per cent. of the insects on wheat were of this species. In France, the parasitic destroyers of the midge amounted to 85 per cent.; while, in this country, our parasites form only 10 per cent. And after the full investigation of the subject which I have now made, I can state this fact with confidence—*we have no parasites in this country that destroy the wheat midge*. The insect so common on wheat, and which resembles the European parasites of the midge so closely that, in the New York Natural History, it is described as being one of that species, and in the Ohio Agricultural Reports it is confidently set down as another of them, I find has nothing to do with the wheat midge, but is the parasite of an ash gray bug which is common on grain and grass, laying its eggs in the eggs of this bug, and thus destroying them.

"I stated to the society, a year since, that the wheat midge had wholly vanished the previous summer; not one of its larvæ could I find, on a careful search over an extensive district around me. But the past season this insect appeared in the wheat again, as numerous as usual. This has led us into important changes in our views of the habits of this insect. How was it possible for it to utterly disappear from the wheat one year and be back in it in swarms the next year? Obviously it must have other places of breeding than in the wheat. And, therefore, if no wheat was grown in this country for a few years, as has so often been proposed, it would not starve and kill out this insect. The insect would resort to other situations, and would sustain itself there, returning into the wheat again as numerous as before, when its cultivation was recommenced. And what could it be that banished this insect from the wheat in 1860, and brought it back again in 1861? The remarkable difference in the weather of these two years furnishes an answer to this question. When the midge fly came out to deposit its eggs in June, 1860, the weather was excessively dry; in 1861 it was very wet and showery. And thus we learn the fact that these flies cannot

breathe a dry, warm atmosphere; they are forced to retreat to places where the air is damp and moist. When the uplands, the ploughed fields, are parched with drought, the midge cannot abide in them; it must go to the lowlands along the margins of streams, where it must remain so long as the drought continues. Here it must lay its eggs and rear its young, depositing them, probably, in the grass growing in these situations. And hence we also learn that if the last half of June is unusually dry, our wheat that year will escape injury from the midge; but if the last half of June is very wet and showery, this crop will be severely devastated."

Indian corn.—This crop in 1849 was 592,071,104 bushels; in 1859 it was 830,451,707 bushels, which is an increase of more than forty per cent. In a majority of the States this is undoubtedly the most popular crop; it is less liable to failure than any other, and is applied to so great a variety of useful purposes. No important changes have been made either in the varieties cultivated or in the modes of cultivation, except in the gradual substitution of animal for human labor.

Cotton.—The rapidity with which the cultivation of cotton has increased in the United States is truly wonderful. In the beginning of the present century the annual exportation was less than 5,000 bales; in 1849 the quantity grown had reached 2,445,793 bales of ginned cotton of 400 pounds each; in 1859 it had further increased to 5,196,944 bales, or more than 110 per cent. in ten years. The whole crop is the product of thirteen States, but is chiefly obtained from eight of them. Immense as is the quantity of cotton produced, the demand is equal to the supply. Prior to the production of cotton in such vast quantities in the more southern States, it was extensively cultivated for domestic purposes in North Carolina, Virginia, Maryland, Delaware, and southern Illinois, and it is not improbable that its cultivation may be re-established in some of these States with profit to the producer and advantage to the consumer.

Dairy products.—The quantity of butter produced in the census year 1859-'60 is set down at 460,509,854 pounds, which is an increase of 46 per cent. on the product of 1849-'50. The amount of cheese returned is 105,875,135 pounds, or 339,242 pounds more than the product of 1849-'50. Cheese is especially rich in flesh-forming constituents, and is therefore regarded as a highly nutritious article of diet, well adapted to the use of the laboring man, and capable of doing more to repair the waste of muscular exertion than many times its weight of butter or of fat meat. Still it appears that cheese does not enter largely into the daily food of the working classes of this country, as it does in Germany and Great Britain. Were it produced more abundantly, and sold at a lower price, it is probable that an article of food so convenient and economical would be more fully used. The cheese exported from the United States to other countries is about 15,000,000 pounds annually. In fact, were cheese-making as well understood in our country generally as it is in Europe, the demand would be greatly increased. It is believed that our people suffer immensely by not thoroughly understanding the most approved processes of cheese-making. Comparatively little of the prodigious quantity produced can be termed a first rate article. While many of our most enterprising dairymen supply an article creditable to the country, in Europe what is termed American cheese is not purchased with that confidence with which we receive theirs, and for the reason that the processes have not reached that perfection which alone contributes to uniformity of excellence and distinctiveness of character.

When this point is attained a taste is cultivated, and increasing demand follows, and profits enlarge. An article so nutritious and easy of transportation should form some portion of our army rations.

Domestic animals.—The tables of agriculture will show a satisfactory increase in the live stock of the country. In addition to returns of animals employed in agriculture and possessed by farmers, we have prepared a table from the returns

of the census-takers which represent an *estimate* of the different varieties of live stock which, being owned by persons not engaged in agricultural pursuits, were not included in the agricultural schedule. These returns we believe entitled to confidence, and they swell considerably the numbers contained in the official statements. As all live stock thus circumstanced was omitted in the previous census, we have, in all our comparisons and calculations, ignored it, because, being omitted in previous censuses, its introduction into the figures at this time would interfere with the apparent rate of increase.

The horses included in the table referred to comprise carriage, team, and other horses which were previously, and in this census, omitted, but which will be seen to make a vast increase to the number returned in the agricultural schedule. The addition to all varieties of live stock thus made to appear, and which exists, is a matter of no inconsiderable importance.

Value of animals slaughtered.—The value of slaughtered animals for 1849 was \$111,703,142, in 1859 it had reached \$212,871,653, the largest part of the increase being in the western States. The manufacturers of soap, candles, leather, glue, bone-black and others depending on this source for their material have received a proportionate development.

Sheep and wool.—The number of sheep returned by the census of 1850 was 21,723,220, and the amount of wool 52,516,959 pounds. In 1860 the number of sheep returned was 23,317,756, and the amount of wool 60,511,343 pounds.

In addition to the number of sheep above mentioned as returned by the census, the assistant marshals reported 1,505,810 as their estimate of the number of sheep not included because owned by others than farmers, so that the entire number of sheep in the United States on the 1st day of June may safely be placed at 62,017,153, and a proportionate amount may be added with propriety to the clip of wool for the same period.

While the sheep of the United States increased but 1,594,536 between 1850 and 1860, the imports of wool and woollens during that period were as follows:

Year.	Value of imports of unmanufactured wool.	Value of imports of manufactured wool.	Year.	Value of imports of unmanufactured wool.	Value of imports of manufactured wool.
1850.....	\$1,631,691	\$17,151,509	1856.....	\$1,665,064	\$31,961,793
1851.....	3,433,157	19,507,309	1857.....	2,125,744	31,265,118
1852.....	1,930,711	17,573,964	1858.....	4,022,635	26,466,091
1853.....	2,609,718	27,621,911	1859.....	4,444,954	33,521,956
1854.....	2,822,185	32,362,594	1860.....	4,842,152	37,927,190
1855.....	2,072,139	24,404,149			

The aggregate exports of domestic wool during the whole of the same period only reached the value of \$1,562,502; and there were no exports of domestic manufactures of wool.

The average price of fine wool in one of our principal wool markets, (Boston,) for the last thirty-five years has been $50\frac{3}{10}$ cents per pound; of medium, $42\frac{3}{10}$ cents; of coarse, $35\frac{1}{2}$ cents. The consumption of mutton has rapidly increased. The supply now as rarely exceeds the demand as with any other meat, and the best qualities out-sell beef in our markets.

No country is better adapted by natural, and on the whole, by artificial conditions to the production of wool than the United States. It appears to be conceded that Australia and South America, contain the only very extensive regions of the earth now capable of competing with equal areas of our country

in this production. That narrow rim of vegetation which encloses the vast inland deserts of Australia presents not a circumstance of superiority, for this object, over the immense natural pastures of our western and southwestern States and Territories, and it is manifestly inferior to them in important conditions. Portions of it are destitute of running streams for hundreds of miles, and it is subject to the periodical recurrence of droughts, which in some cases have extended through years, drying up all minor vegetation, and proving most destructive to flocks and herds. The government price of lands is higher than in the United States. Its distance from its wool market equals nearly half the circumference of the globe. Yet its exports of wool rose between 1810 and 1850 from 167 pounds to 40,000,000 pounds! South America is also becoming an extensive producer and exporter of this staple. Here, too, no natural conditions of superiority over those of the United States present themselves, while there are political and moral ones which undeniably are hostile to the security and permanence of so exposed a branch of industry.

Apart from the mere question of the cheap production of wool, the experience of the most advanced agricultural nations, like England, Germany, and France, goes to show that sheep are a necessity of a good general system of husbandry on even the highest priced lands and amidst the densest population. They afford as much food to man, in proportion to their own consumption, as any other domestic animals. They are believed to return more fertilizing matter to the soil. In addition to these things, they alone furnish wool. England proper has about five hundred and ninety sheep to the square mile. The United States proper (exclusive of Territories) have about forty-eight to the square mile.

Our people have not lacked the necessary breeds to embark vigorously and advantageously in every department of sheep husbandry. In fine-wool varieties we have selections from the best flocks of Germany. In varieties ranging from fine to medium we have the American merino, yielding fifty per centum more wool than his Spanish ancestor, without a deterioration in its quality. In coarse varieties, we have the choicest mutton-breeds of England, and also hardy and productive sub-varieties between these and what are termed our native sheep. No country has ever been so liberal in importing the most highly-esteemed foreign breeds of sheep, and none has been more successful in acclimating them. Some have been greatly improved among us, and none, it is believed, have degenerated where the systems adapted to their culture have been found profitable.

In view of all the preceding facts, it would seem most anomalous that a people so intelligent and enterprising as our own should have advanced so slowly in one of the most important departments of industry, should have consented so long and so largely to import a prime necessary of life which they could actually produce and market at a less cost than the exporter.

American wool-growers attribute this state of things mainly to two causes: tariff regulations, which give protection to the woollen manufacturer and not to the producer, and to the unsteadiness which has marked our tariff policies. Though the monetary state of the country and other incidental causes have undoubtedly contributed their influences, it is not to be denied that a comparison of wool prices under the different tariffs gives color to the first conclusion, because, contrary to all the earlier anticipations of the growers, they show that there has been no coincidence whatever between high and low wool prices and what are termed high and low tariffs, but quite as often precisely the reverse. If the above position of the producer is well taken—if he is not equally protected with the manufacturer—it is not a sufficient answer to his complaint to say that he needs no protection because he can already produce the staple as cheaply as his foreign competitor. The ordinary wool-growers of the United States can no more live as he now lives, on the same profits which content the wealthy Anglo-Australian or South American grower, than can our ordinary

manufacturers live as they now live on the profits which content the manufacturers of Europe. Much the greater number of our producers are comparatively small land-holders and capitalists, yet they have the duties of intelligent freemen to discharge and the expenses of liberal members of society to incur. Their expenditures in directions which tend to comfort and self-respect, and which promote civilization and the public interests, are ten times greater than those of persons of the same wealth in the foreign countries from which the competition comes. Is not our government as much bound, both by justice and expediency, to assist this class of men to preserve their respectable status as to render like assistance to any other class? Is the production of a great staple of less consequence to our country than its manufacture?

It is complained that the rapid and almost radical changes which have taken place in our tariff legislation, now stimulating both the producer and manufacturer of wool beyond the boundaries of prudence, and now suddenly withdrawing much of the protection on which their anticipations and arrangements for the future were founded, have necessarily led to ruinous disappointments, and finally impaired the confidence of the community in the safety of investments in a husbandry subject to such interferences.

The present would seem an auspicious period to establish permanent policies in these particulars. One of the principal causes which has rendered it difficult to estimate the public receipts in advance—the fluctuations between large and small sales of the public lands—is now probably removed. These sales, always advancing at the same time with imports and duties, that is, in periods of pecuniary inflation, were sometimes sufficient at such periods, with the aid of only a moderate tariff, to lead to the accumulation of large surpluses of revenue. These produced clamorous and successful calls for a reduction of duties. But in periods of pecuniary depression the sales of the public lands fell off; the reduced tariff was found insufficient to raise the necessary revenue, and another change in the opposite direction became necessary.

While it is not probable that surplus revenues will accrue, from any cause, for many years to come, the most intelligent and experienced wool-growers of our country ask for no extreme or disproportioned legislation in their behalf. They only ask that in establishing a system of revenue adequate to the public wants, the interest they represent receive a share of protection fairly proportioned to its importance and requirements. If this is accorded, and the policy established is allowed to acquire a permanent character, it is not doubted by our agriculturists that this important branch of industry will rapidly attain a development which will no longer leave us tributary to foreign nations for one of the most important necessaries of life.

In view of the limited number of American publications devoted to sheep husbandry which have appeared, we feel it a duty to refer to a valuable repository of useful information, being a treatise on fine-wool sheep husbandry, by Henry S. Randall, LL.D., of New York, read before the New York State Agricultural Society, February 12, 1862. 127 pages, 8vo.

Sugar and molasses.—Notwithstanding the large quantities of sugar and molasses produced in the United States, a large amount is obtained from abroad. The sum paid for imported sugars, in 1859, exceeded \$31,000,000, and in the same season 30,000,000 of gallons of molasses were imported.

The rapidly increasing culture of the Chinese sugar-cane is supplying a great want. The introduction of such a crop to the notice of the American farmer is a prominent feature of the past decade. While, in the present state of knowledge, much difficulty and uncertainty seems to attend the manufacture of sugar from this plant, it has proved its value as very productive in sirup or molasses. The plants introduced into this country are from Asia and Africa, and vary considerably in character. They are liable to hybridization with each other, and with the broom corn, and much care is required to preserve the varieties

distinct. So far as we have information, Mr. J. H. Smith, of Quincy, Illinois, has been the most successful cultivator of the imphee, and his efforts have been attended with much success. While, with our knowledge of the disappointments which have been experienced in Europe and this country as to results, we would not recommend a heedless expenditure of time and means in the culture of the imphee, we are sufficiently confident in its value, under many circumstances, as to hope that farmers generally of the north and west will devote some attention to the culture of the plant, and fairly test its utility for the production of sugar.

The product of cane sugar, as returned by the Seventh Census, was 237,133 hogsheds of 1,000 pounds each; in 1859 it was 302,205 hogsheds. The product of molasses for the former year was 12,700,991 gallons; for the latter 16,337,080 gallons. From the sorghum and imphee, 7,235,025 gallons of molasses were made in 1859.

The amount of maple sugar made in 1850 was 34,253,436 pounds; in 1860 the product was 38,863,884 pounds. This increase is not large, but sufficient to afford gratifying evidence that our beautiful maple groves and forests are not becoming extinct, while many are preserved with commendable care. We wish it could, with truth, be added that the cultivation of this noble tree was extending in a ratio equal that wherein the old trees in the forest are diminishing under bad treatment and the demands for new land for tillage. The landholder who appropriates a few rods of land to the preservation or cultivation of the sugar tree not only increases the value of his estate but confers a benefit upon future generations.

Tobacco.—The tobacco crop, in 1849, amounted to 199,752,655 pounds, being a decrease of more than 19,000,000 pounds according to the previous census; in 1859 it reached 429,390,771 pounds.

To the production of this amount every State and Territory contributed, although Virginia and Kentucky furnished much more than any other. It would seem surprising that a crop which is said to impoverish the soil more than any other, and to injure to some extent every one who uses it, should be found so desirable as to increase 106 per cent. in ten years; but such is the effect of a ready market with remunerative prices. Several of the northern States present a very large increase in the production of this article. Among these, Ohio, New York, Connecticut, Massachusetts, and Pennsylvania exhibit both the largest product and the greatest increase. Ohio raised, in 1859, over 25½ million pounds, and New York increased her production from 83,189 pounds to 5,764,582 pounds; Massachusetts from 138,246 to 3,233,198, and Connecticut from 1,267,624 to 6,000,133 pounds. Virginia, North Carolina, Maryland, Kentucky, and other of the more southern States show a greatly augmented growth of the staple.

There has been a commensurate increase in the manufacture of snuff, cigars, and other ultimate products of the tobacco crop, while the consumption of the article in various forms doubtless keeps pace with the production.

Wine.—The returns upon the subject of wine-making show a very large increase in an article which promises to become one of great commercial value. The wine culture has increased in a considerable number of States, but more particularly in Ohio, California, and Kentucky. The quantity of domestic wines was increased from 221,249 gallons in all the States and Territories in 1850, to 1,860,008 gallons in twenty-two States in 1860, or at the rate of 740 per cent. Of this quantity the three States above named made nearly one million gallons, and Ohio alone more than half a million gallons. The return was probably far short of the real amount.

The culture of the grape and the manufacture of wine are rapidly increasing. So soon as cultivators become assured that they possess varieties of the grape

of sufficiently good quality, thoroughly hardy and adapted to our climate, the development of this form of industry is likely to be still more rapid. More than \$4,000,000 was paid by citizens of the United States in 1859 for imported wines; the amount paid by consumers for a factitious home-made article it is perhaps impossible to ascertain. A good native wine may and should at once take the place of the spurious article, and in a few years of a large part of the imported. This is the more desirable, inasmuch as the disease which so seriously affects the vineyards of Europe greatly diminishes the quantity and increases the price of good wine, and at the same time tempts producers there to practice extensive adulterations. Nothing will effect a substantial temperance reform so certainly and speedily as the production of good wines in such quantity as to place them within the means of the poor as well as the rich; and every man who plants a vine will be a useful co-operator in the beneficent work of relieving the country from the evils of intemperance by the substitution of a healthy beverage for the various forms of poisons which take the name of spirits and concentrate and diffuse misery over the land.

Hay and clover.—The hay crop of 1849 was 13,838,642 tons; in 1859 the quantity reported is 19,129,128 tons. This increase is not proportionate to the increase of live stock in the country, but it appears that, with better farming, more roots and cut straw and other rough fodder are used, and therefore less hay is required. Without adding to the present extent of meadow lands, the hay crop might probably be greatly increased by the careful introduction of the best varieties of grass.

The quantity of clover-seed grown in 1849 was 468,978 bushels; in 1859 the amount was 929,010 bushels. This increase is important not only in a commercial point of view, but still more so as indicative of improvement in our agricultural system.

Orchard products.—These consist principally of apples and peaches, dried and undried. Their value in 1849 was \$7,723,186; in 1859 it had reached \$19,759,361. This large increase is principally due to the fact that for several years great attention has been paid to the introduction and cultivation of improved varieties of fruit, and to processes for the preservation of fruits by artificial means, which now occupy a great amount of capital. The pear, which for several years was almost left out of general cultivation on account of what was termed the "blight," has of late been less affected by this injury than formerly, and is now extending rapidly in public estimation, being justly regarded as one of the most delicious and profitable of fruits.

Silk.—The production of raw silk in the United States still remains inconsiderable in comparison with what was at one time expected. It has, however, been demonstrated that many parts of the country are well adapted to the growth of the mulberry, and that the production of silk is profitable. Were silk-raising pursued steadily wherever the climate is suitable, very profitable employment would be afforded to thousands of persons, especially females, who are now almost without such employment during a considerable portion of their time. The best way to make silk-growing profitable to individuals and the country, is to encourage its production in small quantities by many families, rather than for a few persons to undertake its production on a large scale; at least, such is the lesson taught by all silk-producing countries. By such means the cost would prove trifling, but the aggregate product would be immense. The value of silks of all kinds imported in the year ending June, 1860, exceeded \$33,000,000.

Improvements.—No better evidence of the progressive improvement of American agriculture need be adduced than the great amount of animal forces employed to assist the labor of man. The number of horses, mules, and oxen engaged in agricultural labor is probably greater than the number of men, a proportion that

has no parallel in any other country. All of this animal force is, of course, made available through some form of machinery. Since the preceding census the use of the reaper and mower has become not merely general but almost universal. Some of the most important crops are now seeded, cultivated, gathered, and prepared for use or market with little or no labor from man except where he is aided by mechanical appliances and animal force. The employment of steam in agricultural operations is much less common in the United States than in Great Britain, but is gradually increasing.

Draining.—This important improvement has made great progress in the estimation and practice of our farmers. Tile factories have been established extensively in many parts of the country, and consequently the material for making permanent drains is much cheapened.

Should the next ten years witness an equal advance in this direction, underdraining will be regarded as among the most indispensable operations of the farm, and its benefits will soon be fully realized.

Underground draining involves an amount of wealth not yet appreciated, though rapidly becoming realized by the American farmer. It is an undoubted fact that the most productive portions of our farms, and which are fertile in fivers, lie neglected and worse than useless for the want of knowledge or the absence of enterprise. An assistant marshal in the State of New York made report of one farmer near Geneva, who has laid on a moderate-sized farm some fifty miles of tiles, and acquired wealth as the result. A single year's crop from land before useless, has sometimes paid all the expense of the improvement, and the drains made twenty years since are as efficient as when first constructed. For health and wealth nothing contributes more where circumstances admit of it—and where do they not, to a greater or less extent?—than underground drainage. An implement of great value has recently been patented, which opens and covers a furrow of considerable depth, and lays at the same time pipe for introducing or carrying off water.

Irrigation.—This is already found to be necessary or highly beneficial in Utah, New Mexico, and California, and is there extensively practiced. To systematic irrigation we may look for covering with luxuriant vegetation millions of acres now commonly regarded as unfit for cultivation. It will doubtless be found to prove remunerative in many of the older States where it has not yet been adopted.

Progress of invention in threshing instruments.—As next in point of importance to the production of grain consists the facility for its early and economical preparation for market, the value of implements and machinery tending to this end cannot be overestimated; and as the progress whereby perfection is attained in any improvement so valuable as that which has, through a long process of years, attended the construction of threshing implements, is interesting to the political economist as well as the farmer and statesman, we have endeavored to group together all the essential facts connected with their history. The plough, hay and grain cutters, and some other implements of husbandry, have attained to such perfection within a short period, and their history is so generally known to the present generation, that special allusion to them may with propriety be deferred to a future period.

It appears that the number of patents granted in the United States for threshing-machines, exclusive of a considerable number for threshing clover, and those combining threshing apparatus with cider or grist mills, straw-cutters, &c., was *three hundred and fifty-four*—a larger number than had been given for any other instrument or process, except the plough and the water-wheel.

Some kind of mechanical means for separating grain from the ear appears to have been early contrived. A complete history of the successive changes in the means and instruments for effecting this would be a curious and interesting

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