



Class P669.1 Book A51 v.4



PRESENTED BY

Jo. S. Werts,

THE
AMERICAN IRON TRADE
IN 1876.

POLITICALLY, HISTORICALLY, AND STATISTICALLY
CONSIDERED.

BY

JAMES M. SWANK,
SECRETARY OF THE AMERICAN IRON AND STEEL ASSOCIATION.

ANNUAL REPORT TO JANUARY 1, 1876.

PHILADELPHIA:
THE AMERICAN IRON AND STEEL ASSOCIATION,
No. 265 SOUTH FOURTH STREET.
1876.

2649.1

AEI

1.4

Entered, according to act of Congress, in the year 1876, by

JAMES M. SWANK,

In the office of the Librarian of Congress, at Washington, D. C.

Printed by
ALLEN, LANE & SCOTT,
No. 233 South Fifth Street,
Philadelphia.

ANNUAL REPORT OF THE SECRETARY.

SAMUEL J. REEVES, Esq.,

President of The American Iron and Steel Association.

SIR:—I have the honor herewith to present to you and the members of the Association my annual report for the year 1876, a brief explanation of the scope and purpose of which is respectfully submitted.

It was clearly incumbent on this Association that it should fully recognize the significance of the two important events which are this year so prominently brought to the attention of the American people. The concurrence in 1876 of the Hundredth Anniversary of American Independence and of the International Industrial Exhibition at Philadelphia could not be suffered to pass without recognition by an organization which represents an industry that was systematically oppressed before Independence was secured, and that today, in almost every State of the Union, and at the International Exhibition, shows in its extent and completeness the fostering hand of a paternal government and the skill and energy of American workingmen. I have conceived it to be a fitting recognition of the patriotic spirit of this Centennial year to state anew the benefits of that governmental policy without which our iron industry would scarcely have had an existence; and I have accepted it as a plain duty to contribute to the lessons of the International Exhibition all the historical and statistical information obtainable concerning the growth and present condition of that industry. If any doubt could have been entertained of the propriety of a restatement in 1876 of the benefits to the American people of the protective policy, that doubt would have been dispelled by the fresh assault which has been simultaneously made upon that policy in British journals and trade organizations and in our National House of Representatives during the past six months. If the enemies of protection on both sides of the Atlantic ocean are more than usually active in this Centennial year, its friends would be unfaithful and culpable in the extreme if they were to remain idle. I therefore make no apology for introducing this subject into the accompanying report.

In referring to the policy of protection to home industry to which the American iron industry owes so much, I have aimed to avoid entirely the presentation at second hand of abstract theories of political economy. I have chosen rather to present irrefutable facts, and generally facts of recent occurrence and present application, which sustain and illustrate the broad principle that protection against foreign industrial competition is as clearly one of the first laws of civilized nations as self-preservation is a law of nature itself. Good men of all parties and the young men of our country who are not educated in our free-trade colleges are hungry for facts which prove the correctness of the proposition that protection is a blessing and the fountain of

blessings to the country that adopts and steadily adheres to it, and I have felt that no better service could be rendered to the cause of protection than to present in popular form as many of these facts as could be conveniently compressed into a small but not too narrow compass.

In examining the policy of protection in the light of undoubted facts, I have found it to be impossible to ignore the industrial example of Great Britain, and much against my inclination I have commented upon it at some length. If the manufacturers and merchants of that country did not steadily pursue the policy of ungenerous and offensive interference with the domestic affairs of other countries; if they did not send emissaries to this country to corrupt our press and debauch our legislators in the interest of so-called free trade, which benefits them and is an injury to us; if they had not within the past year organized their Iron Trade Association avowedly to secure where possible a modification of all foreign tariffs, that the British iron trade may be strengthened and the iron industry of other countries may be destroyed, it would not have been necessary to show in this report the weak side of British commercial character and the sad results to British workmen of British efforts to monopolize the world's important manufactures.

I have devoted much space to a compilation of interesting and valuable facts relating to the history of ironmaking in our country from its earliest settlement down to the present year. Although much time has been expended in the examination of historical authorities and in correspondence with gentlemen supposed to be possessed of accurate information relating to our iron history, I am nevertheless conscious of the incomplete success of an effort to rescue the leading events in our iron history from threatened oblivion or inextricable confusion. Many statements of fact contained in historical and other publications can not be verified, and must be accepted as found; while the recollection of living ironmasters is often defective and conflicting. I can only say that I have used due diligence in seeking for correct sources of information, and that few statements of fact have been accepted without being subjected to the closest scrutiny. The chapter devoted to the nineteenth century is largely prepared from original information.

The part of the report which is devoted to our iron and steel statistics will be found to be full and comprehensive. It contains in great detail all the statistics of production gathered in recent years by this Association directly from the manufacturers, and a great variety of other statistical information showing the growth of our iron industry in former years, our exports and imports of iron products, etc., etc., which has never before been so fully and consecutively presented. Various miscellaneous statistical tables of interest and value will also be found occupying a large part of the report.

The report is separated into general divisions, representing the political, historical, and statistical phases of our iron industry, each of which divisions is subdivided by subjects; so that, with the help of the Table of Contents, the reader will have no difficulty in turning to any information, comprised within the report, which he may seek.

Very Respectfully,

JAMES M. SWANK,

PHILADELPHIA, July 22, 1876,

Secretary.

CONTENTS.

THE INDUSTRIAL POLICY OF GREAT BRITAIN.

	PAGE
Protection to Home Industry the Policy of Most Nations, . . .	9
Great Britain the only Nation professing Devotion to Free Trade, . .	10
Protective Doctrines popular on the Continent of Europe, . . .	11
Representative Institutions and Protection go hand in hand, . . .	11
The Important Colonies of Great Britain favor Protection, . . .	12, 13
Great Britain herself not the Devotee of Free Trade that she affects to be,	14
British Free Trade purely Theoretical,	15
Agriculture commended to the United States by Free-trade Writers, .	16
The Folly of Exclusive Devotion to Agriculture exposed, . . .	17
England once almost exclusively an Agricultural Country, . . .	18
Other Nations flourished at her Expense,	19, 20
The Poverty of the English People while engaged in Agriculture alone,	20, 21
Protective Legislation by England in the Fourteenth Century, . .	21
English Commerce wrested from Foreign Traders,	22
Various Measures of Protection adopted by the English Parliament,	23-25
American Colonial Manufactures restricted by Great Britain, . .	25-27
British Legislation concerning the Importation of Indian Cotton Goods,	27
Certain Manufactures forbidden to be imported into Great Britain, .	28
Government Bounties on Exports to encourage Manufactures, . .	28
How England protected her Iron Industry,	28
Protective Duties imposed by Great Britain in 1829,	29
The British Government did not begin to adopt Free Trade until 1842, .	29
British Protective Duties in Recent Years,	30
Causes of the Partial Abandonment of Protection by Great Britain,	31, 32
The Partial Abandonment of Protection purely a Trade Measure, .	33
British Free Trade not a Philanthropic Policy,	33
The Destruction of Irish Manufactures,	34
The Destruction of Indian Manufactures,	35
China compelled to open her Ports to Indian-grown Opium, . . .	35
Japan and her Treaty with Great Britain,	36
British Hostility to American Manufactures,	36
The True Object of British Free Trade defined by British Authorities,	36-38
The Early Downfall of British Industries not to be expected, . .	38
The British People the Romans of Modern Times,	39
England's Supremacy partly due to her great Natural Resources, . .	40
The Decay of England's Industrial Power not yet begun, . . .	41
The Possession of Superior Industrial Advantages constantly claimed,	41
England's Supply of Coal and Iron Ore in no Danger of Exhaustion,	42, 43

	PAGE
Wages of Labor not permitted to enhance the Cost of Manufactures, . . .	44
The best Industrial Policy is that which elevates an entire People, . . .	45
The Condition of England's Poor,	45, 46
Contrast between the Wealth of the Few and the Poverty of the Many, . . .	47
For 400 Years it was a Crime for a Workingman to seek higher Wages, . . .	48
Scotch Miners and Coal-bearers sold with the Mines until 1775, . . .	48
Labor degraded and oppressed to secure Cheapness in Manufacturing, . . .	49
British Workingmen's Homes, Food, etc., of the Meanest Description, . . .	50-52
Workingmen brutalized through low Wages,	53
Women employed in Smith-shops and Brick-yards,	54, 55
Women in Collieries and Boys in Rolling-mills make Cheap Iron, . . .	56
The Subjection of Labor the Vital Principle of all Trade Monopoly, . . .	57
British Workingmen capable of High Development when fairly treated, . . .	58

THE INDUSTRIAL POLICY OF THE UNITED STATES.

Protection a Principle; not an Expedient,	59
The Revolutionary Fathers were Protectionists,	60
Great Britain interfering with our Manufactures after the Revolution, . . .	61
Import Duties from 1812 to 1824,	62
The Effect of the Tariff of 1816 upon the Prosperity of the Country, . . .	63
The Tariff of 1824 the first Thoroughly Protective Tariff Act,	64
The Tariff of 1833 and its Effects,	65
Effect of the Protective Tariff of 1842 and the Low Tariff of 1846, . . .	66, 67
Objectionable Features of <i>ad valorem</i> Duties on Manufactured Goods, . . .	67
The Low Tariff of 1857 and the Protective Tariff of 1861,	68, 69
Prices of Cotton and Woolen Goods, Steel and Iron, Rails, Nails, etc., . . .	69-74
The Prices of Saws, Axes and Hardware, Crockery, Salt, Starch, etc., . . .	75-78
Effect of Protection upon Agricultural Products and Wages of Labor, . . .	78
A. H. Wrenn's Reminiscence of Prices Fifty Years ago,	78
Extract from a Speech by Henry Wilson in 1872,	79
Low Prices of Manufactures largely due to Home Competition,	80
The Theory that the Duty is added to the Price a Fallacy,	81
Protection decreases Prices, while Free Trade increases them,	82
General Domestic Exports under Protection and Free Trade contrasted, . . .	83
Agricultural Exports increased under Protection,	84
Exports of Agricultural Products do not depend upon our Imports, . . .	85
Our Exports of Iron, Steel, Leather, etc., increased under Protection, . . .	86
The Exportation of American Manufactures due to their Superiority, . . .	86
Exports of Locomotives and Iron Bridges,	87
Exports of Railway Cars and Agricultural Implements,	88
Exports of Scales, Sewing Machines, and Fire Arms,	89
Foreign Testimony to the Superiority of American Hardware, etc., . . .	89-93
Argument against our Protective Policy by the <i>London Times</i> in 1861, . . .	93
The <i>London Times</i> now fears Competition from the United States, . . .	94
American Manufacturers must become better Merchants,	95
Protection gives Diversified Employment to our People at good Wages, . . .	96

	PAGE
American Manufactures promoted by our Patent System,	96
Protection educates the Public Taste, and thus improves our Products,	97
English-made Goods compared with those made in America,	98-103
Our Inability to export Certain Products explained,	103
A Necessity still exists for the Protection of the Articles we export,	104
Purchasing Power of American and European Wages compared,	105-109
The Cost of Living to-day not so high proportionally as Wages,	110, 111
American Savings Banks <i>versus</i> English Burial Clubs,	111
Decline in American and British Wages since the Panic compared,	112, 113
The Protective Policy of the United States benefits the Whole People,	114

HISTORICAL SKETCH OF THE AMERICAN IRON TRADE.

The first Colonial Ironworks established in Virginia in 1620,	115
The Erection of Ironworks in Massachusetts in 1643,	116, 117
Early Ironmaking in Connecticut and Rhode Island,	118
The Structure and Use of the Primitive Ironworks,	119
New Jersey early Prominent in the Manufacture of Iron,	120
The Progress made in Massachusetts, Rhode Island, and Connecticut,	120, 121
Commencement of Ironmaking in New Hampshire,	122
The Establishment of Ironworks in Maine, Vermont, and New York,	123, 124
Progress of Ironmaking in New Jersey,	125
Beginning of the Manufacture of Iron in Pennsylvania and Delaware,	126-129
Early Manufacture of Iron in Maryland,	130
Resumption of Ironmaking in Virginia,	131
North Carolina, South Carolina, Kentucky, and Tennessee Ironmaking in the Eighteenth Century,	132, 133
The Colonies export Iron in Considerable Quantity from 1718,	134, 135
The Beginning of the Iron Industry of the Mahoning Valley, in Ohio,	135
The Development of the Hanging Rock Iron Region,	136
The Commencement of Ironmaking at Pittsburgh,	137, 138
Early Attempts to Smelt Iron with Anthracite Coal,	139
Anthracite Coal successfully used in the Manufacture of Pig Iron,	140-142
First Iron smelted with Bituminous Coke,	142-144
The Manufacture of Iron with raw Bituminous Coal,	144
Development of the Lake Superior Iron Region,	145
Development of the Brazil Block-coal District in Indiana,	146
Ironmaking in Illinois, Wisconsin, Missouri, Arkansas, and Georgia,	146, 147
Ironworks in Alabama and Tennessee,	148
The Progress of Ironmaking in Virginia and North Carolina,	149
Ironworks in the Territories, Pacific States, Kansas, Texas, New Eng- land, and Delaware,	150
The Manufacture of Crucible and other Steel,	150
The Beginning of the Manufacture of Iron Rails in the United States,	150-152
The Beginning in the United States of the Pneumatic Process,	152, 153
Summary of the Ironworks of the United States in 1876,	154
Duty on Pig Iron, Bar Iron, Railroad Bars, Steel Rails, Steel, etc.,	154-157

STATISTICS OF THE AMERICAN IRON TRADE.

	PAGE
Production of Pig Iron, Rolled Iron, Nails, and Rails in 1875,	158-160
Production of Bessemer Steel, other Steel, and Blooms in 1875,	161, 162
Production of Pig Iron from 1810 to 1875,	163, 164
Production of Rails from 1849 to 1875, and Rolled Iron since 1864,	165, 166
Our Foreign Iron and Steel Trade in 1875, and Iron Shipbuilding,	166
Production of Lake Superior Iron Ore and Pig Iron from 1856 to 1875,	167
Imports of Iron Ore,	168
Production of Pig Iron from 1872 to 1875, by States,	169, 170
Stock of Pig Iron unsold, December 31, 1874, and December 31, 1875,	171
Production of all Rolled Iron from 1873 to 1875,	172
Production of Rails in 1873, 1874, and 1875, classified,	173
Production of Rails of all kinds from 1871 to 1875, aggregates,	174
Production of Rolled Iron and Nails in 1873, 1874, and 1875,	174
Exports of American Iron Products from 1770 to 1875,	175-179
Imports of Iron Products from 1871 to 1875,	180, 181
Imports of Pig, Railroad, and all Rolled Iron from 1855 to 1875,	182
Our Foreign Commerce for Fifteen Years,	182
Prices of Steel Rails, 1868 to 1875, and Iron Rails, 1847 to 1875,	183
Pig Iron Prices, 1842 to 1875, and Product of Pittsburgh, 1874 and 1875,	184
Cost of making Anthracite Pig Iron and Bar Iron, from 1850 to 1875,	185

MISCELLANEOUS STATISTICS.

United States Railway Statistics for 1875,	186
Statistics of Immigration from 1861 to 1875,	187
The Coal Production of the United States,	188
The Iron Production of the World,	188
The Coal Production of the World,	189
The Iron and Coal Production of Great Britain,	189
British Iron Export Trade from 1871 to 1875,	190
Prices of British Iron, 1871 to 1875, and Cumberland Coal, 1853 to 1875,	191
Prices of Anthracite Coal from 1826 to 1875,	192
Pennsylvania Anthracite and Cumberland Coal Shipments,	193
The Railroads of the World,	194
Immigration into the United States from 1861, by countries,	195
Prices in 1860 and 1876 of Staple Articles of Hardware,	196
Import Duties on Iron and Steel levied by European countries in 1875,	197
Protective Duties in British Tariffs of the Present Century,	198
German Iron Trade Statistics for 1874,	198
Diagram showing the Prices of Pig Iron, Iron Rails, and Steel Rails in the United States for a Series of Years, following page	198

THE

INDUSTRIAL POLICY OF GREAT BRITAIN.

THERE IS NO INTERNATIONAL FREE TRADE.

THE opinion has been industriously disseminated that the policy of protecting home industries by means of duties on imports of foreign commodities is almost exclusively confined to the United States. This is an error. Protection is the policy of many nations; free trade the policy of very few. Of all the leading nations of the world, Great Britain is the only one which professes to practice absolute free trade in the exchange of commercial products; and even Great Britain, as we shall presently show, does this only in a qualified sense. France, Germany, Austria, Russia, Italy, Belgium, Holland, Denmark, Sweden, and Switzerland have protective tariffs. Even unhappy Spain is not without its tariff on imported goods, and impoverished Turkey now admits that to the absence of protection is her present condition largely due. The empire of Brazil, the leading nation of South America, imposes duties on imports which average over forty per cent. of their value. All the South American republics impose similar duties. Many of the colonies of Great Britain refuse to follow the example of the mother country, for they impose protective duties; the colonies of New South Wales and Victoria being especially devoted to the protective policy. In India and Canada there are strong parties favorable to the development of home industry by protective duties, and their views have found expression in local legislation. A careful survey of the whole field leads to the conclusion that the protective policy is everywhere stronger to-day than it has been. Only in Germany do we see manifested any disposition to surrender it, and there the effort to establish partial free trade is being most strenuously resisted.

It may be said that, with the exception of France, no other country is so strongly protective as the United States; but this criticism does not affect the proposition that protection is the rule and free trade the exception among all leading nations. The measure of this protection each country must decide for itself.

To show conclusively that Great Britain alone among leading nations professes devotion to free trade, it is only necessary to refer to the tables of import duties levied by the different European countries on foreign products, published by our government in the Monthly Reports for July, August, and September, 1869, of the Deputy Special Commissioner of the Revenue, Mr. Francis A. Walker. It appears from these tables, which are too long to be transferred to these pages, that every Continental European country levies an import duty upon the manufactured goods and other products of other countries, and that iron and steel products are especially subjected to these duties. The tariff on iron rails in the leading Continental countries of Europe was as follows in 1869: France, \$11.91 per ton of 2240 pounds; Germany, \$12.19; Austria, \$24.38; Russia, \$9.74.

If it be argued that these duties are not levied for protection, but for revenue, we answer that all or nearly all of the duty-paying articles compete with articles which are produced by the countries which impose the duties, and that the policy of free trade means the *free* exchange of commodities between nations. If neither the principle nor the practice of free trade is adopted by the countries of Continental Europe, then they can not in any sense be properly claimed as its converts, even in part. Protection and revenue are not incompatible elements in the formation of a customs tariff; but free trade and revenue from customs are absolutely incompatible when one country exchanges with another products that are common to both. There may be revenue, but there is no free trade. The tariffs of Continental Europe embody the principles of protection *and* revenue in a majority of cases where duties are levied on commodities which compete with home productions; but where these duties are so high as to preclude the presumption that they are intended to encourage even moderate imports, the principle of protection only is preserved. France, Russia, and some of the other countries named in Mr. Walker's tables are examples of the imposition of such high duties. But France, which has been remarkably consistent in her devotion to the protective policy since the days of the first Napoleon, has gone further than this—gone further than

the United States has ever gone. France has positively *prohibited*, and does now prohibit, in her general tariff the importation of many articles which her own people can produce. The United States can not export to France to-day, upon any conditions whatever, refined sugars, tobacco for private account, certain kinds of cast and forged iron, cutlery, copper in certain forms, certain chemical products, common soaps, fine stoneware and earthenware, glass bottles, goblets, etc. The revenue which France derives from these prohibitory duties is not apparent, but the protection which her manufacturers derive from some of them is plain. Her tariff is eminently a protective one, as is her whole fiscal system. A bounty to the exporters of French sugar encourages its production by facilitating its introduction into foreign markets.

In this connection it is noteworthy that the *London Times* of October 12, 1875, frankly admitted the progress of protective ideas throughout Europe, particularly instancing their spread in Germany, Austria, and Italy, and it accounted for the fact in the following remarkable sentence: "*The sudden spread of representative institutions through Europe during the last twelve or fifteen years is suggested as the source of this renewed strength of protection.*" The logical inference from this suggestion must then be true: that free trade is the natural ally of that governmental policy which restricts the spread of representative institutions, a term which is synonymous with civil and religious liberty. Not long ago David Syme, in an essay in the *London Fortnightly Review*, admitted that in Austria, France, the United States, and the British colonies "the party of progress is identified with a restrictive commercial policy," *i. e.*, is protectionist, "while the conservatives are the most uncompromising of free traders." The *Times* has unwittingly paid to the protective policy the highest possible compliment. It is the friend of "representative institutions," and a people struggling for civil and religious liberty and industrial independence have reason to bless it and to fight for it.

The increasing popularity of protective doctrines on the Continent of Europe is also admitted by another high English authority. At the general meeting of the British Iron Trade Association, held at London on the 24th and 25th of February last, its president, Mr. G. T. Clark, of Dowlais, remarked as follows: "Now that nearly every Continental nation, and the United States of America, have decided to foster special native industries by artificial restrictions, it behooves those concerned in the British iron trade to keep a close

watch upon commercial treaties and the tariffs of foreign states, to see that the former be acted upon, and the latter grappled with where not absolutely prohibitive."

That the important colonies of Great Britain should favor the protective policy is most natural; otherwise they would forever remain in a state of industrial vassalage to the manufacturers of England, Scotland, and Wales. These manufacturers, with the countenance of the home government, invariably resist this progressive tendency, but they can hope for no better success in the end than they have met in resisting the industrial growth of the United States.

In 1873 the government of New Zealand offered the following inducements to the development of colonial industries:—A bonus of \$25,000 for the production of 1000 tons of pig iron of marketable quality; a bonus of \$5000 for the production of 100 tons of marketable steel from magnetic or titaniferous iron sand or iron ore; a bonus of \$10,000 for the production of 250 tons of sugar, manufactured from beetroot in New Zealand; a bonus of \$12,500 for the production of 100 tons of printing paper manufactured in New Zealand by machinery, and a bonus of \$1 per hundred to be paid on cured fish, dry or pickled, exported from the colony for consumption abroad. The Melbourne (Australia) *Town and Country*, in its issue for May 31, 1873, stated the results of protection in the colony of Victoria, which is noted for its gold mines, as follows:

The traffic which we entered into during the early days of our history was in fact unprofitable in the extreme, and one which, had not the change been gradual, was likely to plunge the country into ruin. We parted in truth with our real wealth for consumable goods, the place of which could only be supplied by a further expenditure of gold. It was a one-sided trade, leaving no lasting or permanent benefit with the consumer, and impoverishing the country to the extent of the consumption. The introduction of protection, however, has induced local production, which, instead of having had the effect—as its opponents averred—of enhancing prices, has reduced them to rates in fair proportion to the returns of labor. . . . Not only has our Victorian farmer overcome the difficulty of high wages, and fully supplied all our requirements, but, instead of now being importers of bread-stuffs, butter, provisions, boots, cloth, and a hundred other things, we can supply out of our surplus our neighbors; and, with regard to the first three, compete in the very markets upon which we depended for supplies.

The manufacture of cotton goods in India by means of modern machinery commenced in 1863, and to-day there are in that country over six hundred thousand spindles, and many more will soon

be added. There is an import duty on cotton goods of five per cent. *ad valorem*, which in part protects the Indian manufacturers from the competition of Manchester; but the low price at which labor can be obtained in India also operates as a stimulus to its cotton industry. Last year the Manchester manufacturers suddenly became philanthropic, and demanded of the House of Lords that the employment in Indian factories of native workmen for seven days in a week and fourteen hours in a day, as alleged, should be prohibited. The reply of the Secretary of State is significant of the esteem in which English philanthropy is held in India. He said that "the only difficulty would be in the enforcement of the law, as any prohibitory legislation would only be considered in India as *part of the vast English conspiracy to deprive India of her manufactures.*"

Recently, the present premier of the Canadian government, Sir John Mackenzie, delivered an address in support of free trade, declaring that he believed that "the principles of Richard Cobden and the principles of free trade over the world are the real principles of civilization." For this the *Hamilton Spectator*, an able Canadian champion of protection, took Sir John to task. It declared that "all other countries except one adopt protection as a means of advancing their interests, and can Canada afford to forego an advantage which all others adopt, because her self-sacrifice would advance the 'principles of civilization,' as Mr. Mackenzie understands them? Civilization is in no immediate danger; it does not need the protecting care of Mr. Mackenzie, *but the interests of Canada do.*" Late in 1875 a meeting of Canadian manufacturers was held at Toronto, at which resolutions were adopted affirming that American farm produce should not be admitted free while Canadian produce is taxed on crossing the border; that stricter customs regulations to prevent fraud in the way of undervaluation should be established; that the production of iron by a duty of \$2 per ton on imported pig iron should be encouraged; that a government bonus of \$2 for every ton produced in Canada from the ore be continued for ten years; and that a 20 per cent. duty be imposed on goods imported from the mother country; goods from any foreign country to be taxed at exactly the figure imposed by such country on Canadian goods of the same kinds. In January last the Board of Trade of the Dominion of Canada adopted, by 23 against 14 votes, a resolution favoring the protection of home industries, in view of their present depressed condition and the competition of the United States. The *London Times*, commenting on this action, remarks that it shows

"how slowly the principle of free trade, which triumphed in England thirty years ago, makes its way in the self-governing and democratic communities which have been founded beyond the ocean."

We make these extracts and references to show beyond cavil that the colonies of Great Britain do not take kindly to the free-trade policy which would retard the development of colonial manufactures.

But Great Britain herself is not the consistent and zealous devotee of free trade that she affects to be. Putting aside for the moment the fact that she did not announce her conversion to free trade until within the memory of the present generation, and until it suited the interests of her trading classes to do so, we proceed to inquire whether she *now* practices the whole of the creed she is so ready to preach to others. We have before us an English reprint of the British tariff that was in force in 1875, with accompanying statements, and from this publication we learn that the government of Great Britain derived an income of £20,637,855 (about \$100,000,000) as revenue from customs in the fiscal year 1873-4. Examining the items of which this aggregate is composed, we learn that the duty on tobacco realized £7,399,074; on tea, £3,251,203; on brandy, £2,248,546; on wine, £1,793,112, and on dried fruits, £457,513. Many other articles paid duty in that year, including beer, coffee, rum, whisky, pickles, vinegar, gold and silver plate, and a long list of such chemical products as alcohol, chloroform, and varnish. In the nine years from 1866 to 1874 the income of the British government from customs amounted to £193,658,436 (about \$968,000,000). The receipts of the United States from customs during the same nine years amounted to \$1,668,349,914. Thus Great Britain, nominally a free-trade country, derived from duties on customs in nine years an income equal to *fifty-eight* per cent. of that derived from the same source by the United States, a country which has a confessedly protective tariff.

The commodities from which Great Britain derives the large customs revenue to which we have alluded are the products of *foreign* countries, and the duties imposed are a *tax* upon the industries of those countries for the benefit of the British treasury. Thus, China is made to pay a tax upon her tea sold to the British Islands; Brazil upon her coffee; Germany upon her beer and spirits; the South of Europe upon its currants, raisins, and figs; and the United States upon her tobacco and distilled grain, her alcohol, etc. These

taxes are a restriction upon the free exchange of commodities, and their existence confutes most completely the pretense that Great Britain is a free-trade country. This pretense appears all the more daring when it is considered that the British government and British manufacturers demand of the countries we have named, and of other countries, that the products of British industry shall not be subjected to the payment of any tax whatever when they enter foreign ports and foreign markets. China is taxed upon her tea, but China must not tax English cottons; Brazil is taxed upon her coffee, but Brazil must not tax English iron and steel; the South of Europe is taxed upon its fruits, but the South of Europe must not tax English machinery and cutlery; the United States is taxed upon her tobacco, whisky, alcohol, varnish, etc., but the United States must not tax English hardware, salt, woolen goods, linen, etc. All the world must be taxed to support the British government, but all the world must maintain its own police regulations and pay its debts as best it can. It is all right, for instance, for the tobacco-growers of the United States to be taxed to help pay the interest on the British national debt; but it is all wrong for British manufacturers, when they enter our markets, to be taxed to help pay the interest on *our* debt.

That other nations besides our own understand perfectly well the true nature of the free trade which Great Britain pretends to practice, is shown in a communication recently printed in a London journal concerning the state of the German iron trade. The writer remarked that "the opinion is pretty generally expressed by the German protectionists that England has in reality got the better of every European nation, whilst the concessions which she professed to give in return *have never been adequate*. As an instance, the authors of the present agitation point to the *persistent refusal of England* to admit German spirits on cheaper terms against the concession now made to *her iron producers*."

British theoretical free trade means the free exchange of commodities between nations. It nowhere exists: it is a myth. The only real free trade known to civilized nations is that which governs the exchanges between the people of the same country. It is the only kind of free trade that, in the nature of things, ever can exist; for each nation must care for its own interests, and these interests are never identical with the interests of other nations. Between the different sections of the United States, for instance, all trade is absolutely free; while all the sections are alike protected against

foreign industrial assailants, come they in what guise they may. Great Britain imposes duties upon those commodities entering her ports which it suits her to tax, and upon those which it suits her to admit free of duty she imposes no duty. Yet she asks other nations not to impose duties upon such of her products as seek their markets. This is not free trade, nor the shadow of it. It is not *fair trade*. It is the policy that gives a glass bead in exchange for a nugget of gold, or an iron hoop for a handful of precious gems.

ENGLAND ONCE THE INDUSTRIAL SERVANT OF OTHER COUNTRIES.

British writers on free trade never tire in commending to the people of the United States the policy of devoting their energies mainly to agriculture; as if they had been just emancipated from barbarism, and possessed no higher capabilities and no other resources than those which pertain to the most primitive of all occupations. The motive in giving this advice is, however, not past finding out. The *Birmingham Gazette* remarked in 1875: "While England and America are in a great measure one in language, literature, laws, arts, and religion, *the mercantile interests of the two nations are not identical.*" The writers mentioned are sometimes aided in their unselfish and philanthropic labors by a few essayists on this side of the Atlantic, whose principal claim to prominence as political economists rests upon the fact that they once advocated with great zeal a policy precisely the opposite of that which they now teach. One of these essayists, Mr. Edward Atkinson, of Boston, in a pamphlet *On the Collection of Revenue*, published in 1867, seriously advocated the importation from England by Pennsylvania of all the iron her people needed, to be paid for in Pennsylvania wheat. He said:

At the time Pennsylvania was settled, England had already established ironworks, because Nature had indicated iron as one of the natural products of England, by placing there great beds of coal and iron, and but a comparatively small area of arable land. The farmer of Pennsylvania wants iron, which exists in its crude form under his own farm. England wants wheat. Let us suppose that, under the circumstances as they are in Pennsylvania, the farmer of Pennsylvania can produce a ton of wheat with twenty days' labor and a ton of iron with thirty days' labor, and let us suppose that, under the circumstances as they are in England, the Englishman can produce a ton of iron with twenty days' labor, but it takes him thirty days to raise a ton of wheat. The Englishman wants wheat, and the Pennsylvanian wants iron; exchange is free and the barter is made.

The innocent Mr. Atkinson did not see that the true greatness of Pennsylvania is best promoted by a policy that will enable her to produce wheat *and* iron—the former to feed to her ironworkers and other workingmen employed in manufactures, and a part of the latter to be sold in time to other countries and to England herself. If his policy and that of the British free-trade writers could have been made the policy of this country, all the States of the Union which to-day produce both wheat and iron would produce only wheat, and buy their iron in England—selling the Englishman their wheat at the price he would be willing to pay for it, and in such quantities only as his necessities would require, and buying from him the iron they would need at such price as his monopoly of its manufacture would enable him to exact. And so of every other American industry which has been developed by the protective policy.

Horace Greeley once most effectively answered in the following pithy sentences all such delusive arguments as that of Mr. Atkinson :

I am asked if we can import 1,000,000 tons of iron and buy it for \$40 a ton, when it would cost us \$50 to make it at home, why should we not buy it abroad? I answer, for two reasons: Because the \$50 you pay at home does not cost as much in your products—in what your industry naturally produces—as the \$40 if you buy your iron of Europe. The \$50 at home is paid for timber, for work, for five hundred articles, which could never be sold abroad, and for want of a market would have no value. Beyond that I value the skill created by the process. Mr. Madison, instructed by the results of the last war with Great Britain, says that, although it were true that you could buy abroad in a state of peace cheaper than you could make at home, still, he says, you must consider another point, that, in case of war, which you can not always escape, you would have to pay an enormous increased price for what you buy, if indeed you could get it at all, and we must consider whether this increased price would not overbalance the saving that we realize by buying abroad in a state of peace.

Mr. Stephen Colwell, in his *Report upon the Relations of Foreign Trade to Domestic Industry and Internal Revenue*, published in 1866, exposed in the following words the folly of sending abroad to buy that which we can make at home :

Pennsylvania could, with difficulty, pay, in any product of her own, for fifty thousand tons of iron imported from Great Britain; but her capitalists and farmers can feed and sustain a population large enough to take from her own mines and manufacture five hundred thousand tons of iron of the value of thirty millions of dollars, and the same policy extended to her other resources makes her annual product worth \$300,000,000. The proceeds of her agriculture could not be exchanged abroad for one-half of what the iron

brings. In other words, Pennsylvania, without products of her own to spare, which she can exchange in Great Britain for fifty thousand tons of iron, can manufacture ten times that quantity. The whole agricultural product of the State, being thus converted into iron and other manufactures, becomes directly and indirectly a purchasing power in the home market. The product of an acre of wheat exported to England or Scotland may import a ton of iron, but an acre cultivated for vegetables at home will purchase five to ten tons of iron. . . . The incidental advantages of manufacturing for ourselves are worth all the difference between the low prices abroad and the higher at home. These incidental benefits are national independence and self-respect, growing intellectual activity, increasing enterprise and capital, greater progress in the common arts of life and in the fine arts, stimulus to the inventive faculties; but more than all these, and above them all, is the advantage of furnishing full employment to the entire body of the people.

England, always the greater part of Great Britain, once pursued the barbaric policy her free-traders and Mr. Atkinson now commend to us. This was particularly so from the twelfth to the sixteenth century, when all England was almost exclusively an agricultural country, her people being chiefly supplied with manufactured goods by enterprising merchants from other countries, who employed foreign vessels in making their exchanges. "Even iron was imported from the Continent for the use of English blacksmiths." In commercial and manufacturing enterprise England was greatly excelled by the powerful cities of Italy, Spain, Germany, and the Netherlands; while Portugal and France were fairly her rivals in the same fields of national effort. Commerce and manufactures were so little understood by the people of England in the thirteenth century that important concessions were made by the government to the powerful merchants of the Hanseatic League to induce them to settle in England, with permission to manufacture abroad the goods which the English people would buy. For a hundred years this corporation engrossed almost the whole of the foreign trade of England, using its own shipping and furnishing employment to its own factories on the Continent; and for three hundred years, down to the reign of Queen Elizabeth, it was a powerful competitor with other foreigners and with native Englishmen for the possession of that trade. Foreign merchants ruled the trade of England absolutely down to the sixteenth century. In 1483 an English statute referred to the "merchant strangers of the nation of Italy, who bring and convey from the parts beyond sea great substance of wares and merchandises . . . at their pleasure; and there sell the same as well by retail as otherwise."

The manufactured goods with which the people of England were supplied by foreign merchants were largely paid for with the raw products of English farms and mines, and with the fish caught upon English coasts. Macpherson, in his *Annals of Commerce*, states that, in the fourteenth century, "England imported none of the raw materials for manufactures which are so largely imported into Great Britain to-day; while her exports consisted almost entirely of the most valuable raw materials, and of cloths in an unfinished state, which may also be classed among raw materials." The land was also drained of its precious metals. In the fifteenth century a commercial writer complained that the foreigners "bear the gold out of this land, and suck the thrift out of our hand, as the wasp sucketh honey out of the bee." Wool was a principal article of export in the thirteenth and fourteenth centuries. "Raising and spreading a story that wool would not be suffered to be exported in such a year . . . was, on account of its being an injury to trade, punished by indictment." The Flemish woolen manufacturers, who bought it largely, had attained such celebrity in the thirteenth century that an old writer declared that "all the world was clothed in English wool wrought by the Flemish weavers." Foreigners manufactured English wool and finished English woolen cloths and sold them back to England with a profit. It was this condition of affairs that gave rise to the proverb: "The stranger buys of the Englishman the fox's skin for a groat, and sells him the tail for a shilling."

While England was thus limiting her energies to a rude agriculture and to the exportation of raw products, it is recorded that the manufactures of Florence were a source of great profit to its people. "Two hundred establishments, with thirty thousand workmen, were employed in the manufacture of wool." At Bruges, in Flanders, "the merchants of seventeen kingdoms had their factories and domiciles, beside many from almost unknown lands who flocked within its walls." Bruges was a great manufacturing and commercial emporium. "While the merchant frequented the mart, the weaver was busy at his loom, in the production of silk and linen fabrics, as well as woolen cloths," and costlier fabrics.

For hundreds of years after the revival of trade and commerce on the Continent of Europe, England pursued the losing policy we have briefly sketched. Strangers manufactured for her, acted as her merchants in her large cities, and filled her ports with their ships. Neither her commerce nor her manufactures flourished;

nor did her agriculture. The last was of the most primitive and wasteful kind, and was far surpassed by that of Italy and the Netherlands. The agriculture of these countries had been greatly benefited by the attention paid to commerce and manufactures. That of Italy was worthy of comparison with the best results of the nineteenth century. "The Netherlands, too, once covered with swamps and forests, became a rich agricultural country; farms and gardens surrounded the manufactory and the mart; and the wain richly laden with the treasures of merchandise, as it slowly traversed the roads of Brabant, passed through a rich country 'where the mower filled his hand, and he that bound sheaves his bosom.'" But in England "the tillage of fields was very imperfect; producing extremely scanty crops; the implements of husbandry were rude; oxen were so badly fed that it required six of them to draw a plow, which barely turned up half an acre in a summer's day. . . . As there was so little enclosed meadow land, as the cultivation of artificial grasses and turnips was unknown, winter provender for cattle was very scarce; hence many were killed before they were fat. . . . Vegetables were scarce. The roots that now smoke on our table, cabbages, carrots, and potatoes, were unknown in England." "As late as 1547 bullocks bought for the navy weighed less than four hundred pounds." The harvests frequently failed, and great suffering followed.

It can not be said that the English people were prosperous while agriculture was almost their sole occupation. The masses certainly were not. In the thirteenth and fourteenth centuries "the purchase of a pound of candles would have almost absorbed a workman's daily wages. Few persons could have afforded to break the curfew." Clothing was so dear that ordinary linen shirts were devised by will from one generation to another. Even among the upper classes "the cloak, robe, or gown of the day was often the coverlet at night." Glass windows were practically unknown in the huts of the lower classes. "The sale of wool and woofels was the chief profit of the farmer," so little did he diversify his crops. Among the masses "the pig was the most important article of diet," and "during half the year salted meat and hard fish formed the subsistence of the greater part of the community." Iron was dear, and nearly all of it was imported. Metal vessels for domestic use were real luxuries. Hallam expresses the opinion that in the fourteenth century the middle classes of Italy were much more comfortable than those of France or England. The people of the Netherlands also at that

period possessed more of the comforts of civilization than the people of England. In the fifteenth and sixteenth centuries the houses of the working people were still miserable hovels. "There were very few chimneys even in capital towns; the fire was laid to the wall, and the smoke issued out at the roof or door or window. The houses were wattled and plastered over with clay, and all the furniture and utensils were of wood. The people slept on straw pallets, with a log of wood for a pillow." In the sixteenth century carpets were unknown in England, and the floor of the royal presence chamber of Queen Mary and Queen Elizabeth was strewn with rushes or hay.

There is abundant evidence of the fact that, down to the middle of the sixteenth century, absorbing devotion to agriculture, with corresponding neglect of other pursuits, improved neither the agriculture nor the people of England. In the five hundred years from 1075 to 1575 the population of England and Wales but little more than doubled. We can easily imagine what would be the condition of that agriculture and of that people to-day if the policy which so long made England a follower instead of a leader of nations—the policy which Mr. Atkinson commends to Pennsylvania—had been continued. Those "great beds of coal and iron" which underlie English farms, as similar beds underlie Pennsylvania farms, never would have been developed; and, lacking this development, England would be to other countries to-day what Mr. Atkinson, in his broad philanthropy, would have Pennsylvania be to England—a servant and only a servant.

BRITISH INDUSTRIES DEVELOPED BY PROTECTION.

Restrictive measures concerning the exportation of wool and the importation of woollen cloths were adopted by England early in the reign of Edward III., in the first half of the fourteenth century. Blackstone remarks of the legislation in the reign of Edward: "Much also was done, under the auspices of this magnanimous prince, for establishing our domestic manufactures, by *prohibiting* the exportation of English wool and the importation or *wear* of foreign cloth or furs, and by encouraging clothworkers from other countries to settle here." From Edward's time the protective policy is faintly marked in English history. At first, however, only the manufacture of common woollen goods was made the subject of protective legislation; the Continent still continued without restriction to

supply fine cloths, tapestries, silks, linens, laces, cutlery, iron, etc., for many years. Nor did the exportation of wool come to an end; it "became a monopoly of the king's exchequer." In the fifteenth and sixteenth centuries the legislation of England affecting the importation of foreign goods competing with those of domestic manufacture, or retarding domestic manufacturing enterprise, grew more and more restrictive. Under Edward IV., in the fifteenth century, the importation of many manufactured articles was entirely prohibited. When Queen Elizabeth was upon the throne, during the latter part of the sixteenth century, the effect of this policy, of which she was an ardent friend, was seen in the vast development of the manufacturing and commercial interests of the kingdom. Then, for the first time, England began to manifest the possession of those wonderful capabilities which have made her the first commercial and manufacturing nation of modern times.

The policy of Edward III., which gave England her start in many important branches of manufactures, was contemporaneous with the settlement in the country of some Flemish weavers. Others of their countrymen accepted the inducements to immigration which were offered by Edward, and still other skilled foreigners followed the Flemish workmen. In time, however, the large numbers of foreign artisans who had settled in England excited the jealousy of native manufacturers, and many thousand Belgians were expelled from the country in the early part of the sixteenth century by Henry VIII. A few years after the expulsion of the Belgians, summary measures were successfully resorted to by Elizabeth to rid England of the ships and merchandise of the powerful Hanseatic League, which for many years had enjoyed Parliamentary privileges amounting almost to a monopoly of English commerce. All these were, in their time, measures of *protection*, as were those enactments in previous years which had prohibited the importation of certain foreign goods; but so extreme and violent were the last two here noted, that their wisdom and justice would have been more than questioned if they had occurred in our day. English statesmanship and philanthropy first invited foreign merchants and manufacturers to cultivate intimate relations with the unskilled people of England, and then, when the lessons so greatly needed had been freely imparted, they were informed that their services were no longer required, and that their company was not wanted.

Elizabeth, however, was in one respect wiser than Henry. She did not banish from England skilled workmen of foreign birth who had

sought her shores. She encouraged the immigration of Huguenot refugees which had commenced a few years before her accession to the throne, and, partly in consequence of this encouragement, her reign, as already remarked, was a prosperous one for her people. The Huguenots brought over from France the knowledge of many of the mechanic arts of which England had previously been ignorant. "In 1560 a pair of black silk stockings, knit in England, was presented to Queen Elizabeth," as a great achievement. In the seventeenth century the accession to her population of other Huguenot refugees still further added to the manufacturing skill and developed the manufacturing resources of England.

The protective measures we have recited had encouraged the merchants of England to seek foreign markets to exchange English products for the products of other countries. At the close of the sixteenth and beginning of the seventeenth centuries, English manufactures had obtained an entrance into the world's markets. In the days of Elizabeth the annual exports of finished cloth alone reached 200,000 pieces. Employment was thus found for English shipbuilders and English sailors, as well as for English weavers. Yet England needed to take one step more to secure the continued growth of her foreign trade. Most of this trade was still conducted in foreign vessels. "Even the produce of the British colonies was brought to England in Dutch bottoms." The important step was taken in the passage of the navigation acts in Cromwell's time—about the middle of the seventeenth century. Judge Kelley says: "She legislated in favor of her own ships. The foreign article brought in English bottoms came into her ports under differential duties lower than those on the same article coming in on the same day in foreign bottoms. She thus stimulated the building of English ships, and created a great English navy." The importation of colonial products in any other than English ships was prohibited. The navigation acts of the Cromwellian protectorate were supplemented by others in the reign of Charles II., of which hereafter. All these acts were measures of protection to English trade, as much so as were the laws previously passed to encourage home manufactures and the sale of their products in foreign markets. The granting of large bounties of public money to companies of English vessel-owners, which began during the reign of Elizabeth and has been continued down to the present day, was also a most efficient means of affording encouragement and protection to the commercial interests of England.

Further details of the protection afforded by acts of Parliament to English industries are instructive. As one result of the Huguenot immigration into England, the manufacture of silk was greatly extended. "To cherish the industry, the duties on imported silks were *trebled*, and then their importation *prohibited*." In 1678 an act was passed for the encouragement of woollen manufactures, which required that "all dead bodies should be wrapped in woollen shrouds." This act remained in force until 1808. The Irish linen manufacture was established through liberal grants from William of Orange and succeeding sovereigns. The fisheries of Scotland were created by government bounties.

Blackstone, in his chapter on "offenses against public trade," states that "owling, . . . the offense of transporting wool or sheep out of this kingdom, to the detriment of its staple manufacture, . . . was forbidden at common law . . . and by many later statutes. The statute 8 Eliz., c. 3, makes the transportation of live sheep, or embarking them on board any ship, for the first offense forfeiture of goods and imprisonment for a year, and at the end of the year the left hand shall be cut off in some public market, and shall be there nailed up in the openest place; and the second offense is felony"—that is, death. "The statutes 12 Charles II., c. 3, and 7 and 8 William III., c. 28, . . . make the exportation of wool, sheep, or fuller's earth liable to pecuniary penalties, and the forfeiture of the interest of the ship and cargo by the owners, if privy, and confiscation of goods, and three years' imprisonment to the master and all the mariners;" and the statutes 4 George I. and 12 and 19 George II. "make it transportation for seven years, if the penalties be not paid." These prohibitions of the exportation of wool, sheep, and fuller's clay were not repealed until the present century. The same distinguished author, in the same chapter, records another restriction upon the freedom of trade which was enforced during the eighteenth century, and only repealed at its close:

To prevent the destruction of our home manufactures by transporting and seducing our artists to settle abroad, it is provided, by statute 5 George I., c. 27, that such as so entice or seduce them shall be fined £100 and be imprisoned three months; and for the second offense shall be fined at discretion, and be imprisoned a year; and the artificers so going into foreign countries, and not returning within six months after warning given them by the British ambassador where they reside, shall be deemed aliens, and forfeit all their land and goods, and shall be incapable of any legacy or gift. By statute 23 George II., c. 13, the seducers incur, for the first offense, a forfeiture of £500 for each

artificer contracted with to be sent abroad, and imprisonment for twelve months; and for the second, £1000, and are liable to two years' imprisonment; and, by the same statute, connected with 14 George III., c. 71, if any person exports any tools or utensils used in the silk, linen, cotton, or woollen manufactures (excepting wool cards to North America), he forfeits the same and £200, and the captain of the ship (having knowledge thereof) £100; and if any captain of a king's ship, or officer of the customs, knowingly suffers such exportation, he forfeits £100 and his employment, and is forever made incapable of bearing any public office; and every person collecting such tools or utensils in order to export the same shall, on conviction at the assizes, forfeit such tools and also £200.

Near the close of the seventeenth century, in the reign of William III., the exportation of frames or engines for knitting gloves or stockings was prohibited under heavy penalties. A hundred years later, in 1782, "a special act was passed, prohibiting the exportation of engraved copper-plates and blocks, or enticing any workmen employed in printing calicoes to go beyond the sea, under the penalty of £500 and twelve months' imprisonment."

The statutes prohibiting artificers from going abroad were not finally repealed until 1825. The prohibition of the exportation of flax machinery, we are told by E. B. Bigelow, "remained as late as 1842."

The acts of Parliament above recited were of general and universal application, and, in the language of Sir William Blackstone, were intended "to prevent the destruction of our home manufactures"—more properly, to promote their development and growth. The restrictions which the mother country saw fit to impose on her North American colonies were, however, equally as severe as those general prohibitions and penalties which have been quoted. Dr. William Elder tersely states the character of these restrictions as follows: "The colonies were held under restraint so absolute that, beyond the common domestic industries, and the most ordinary mechanical employments, no kind of manufactures was permitted. In 1750 a hatter-shop in Massachusetts was declared a nuisance by the British Parliament. In the same year an act was passed permitting the importation of pig iron from the colonies, because charcoal, then exclusively employed in smelting the ore, was well nigh exhausted in England; but forbidding the erection of tilt-hammers, slitting or rolling mills, or any establishment for the manufacture of steel." A law of Virginia, passed in 1684, to encourage textile manufactures in that province, was annulled in England. The first Lord Sheffield declared that "the *only use* of American colonies or West India

islands is the monopoly of their consumption and the carriage of their produce;" and Lord Chatham declared that "the British colonists of North America had no *right* to manufacture even a nail for a horseshoe." From 1719 to 1732 British merchants "complained in memorials to the government that the people of Massachusetts, New York, Connecticut, Rhode Island, and Maryland were setting up manufactures of woolen and linen for the use of their own families, and of flax and hemp for coarse bags and halters." McCulloch, in his *Commercial Dictionary*, admits that "it was also a leading principle in the system of colonial policy, adopted as well by England as by the other European nations, to discourage all attempts to manufacture such articles in the colonies as could be provided for them by the mother country."

The act of Parliament concerning the manufacture of iron in the colonies, already briefly alluded to, was passed in the twenty-third year of the reign of George II., A. D. 1749, and printed in pamphlet form in 1750 by Thomas Baskett, of London, "Printer to the King's Most Excellent Majesty." It enacted: "That from and after the twenty-fourth day of June, one thousand seven hundred and fifty, *no mill or other engine for slitting or rolling of iron, or any plating forge to work with a tilt-hammer, or any furnace for making steel, shall be erected, or, after such erection, continued in any of His Majesty's colonies in America; and if any person or persons shall erect, or cause to be erected, or, after such erection, continue, or cause to be continued, in any of the said colonies, any such mill, engine, forge, or furnace, every person or persons so offending shall, for every such mill, engine, forge, or furnace, forfeit the sum of two hundred pounds of lawful money of Great Britain.*" And further: "That every such mill, engine, forge, or furnace, so erected or continued, contrary to the directions of this act, shall be deemed a *common nuisance*," to be abated by "every governor, lieutenant-governor, or commander-in-chief of any of His Majesty's colonies in America, where any such mill, engine, forge, or furnace shall be erected or continued."

The Declaration of American Independence recited, among other causes of complaint against the home government, that it had cut off the trade of the colonies "with all parts of the world." How it did this is illustrated in various acts of Parliament which we shall quote.

By the navigation act of 1660 (12 Charles II.), it was provided "that certain specified articles, the produce of the colonies, should

not be exported directly from the colonies to any foreign country, but that they should first be sent to Britain and there *unladen* before they could be forwarded to their final destination." Sugar, molasses, tobacco, hides, iron, corn, and lumber were either originally or ultimately embraced within the provisions of this act, the plain intention of which was to give to England a monopoly of the purchase and sale of all colonial products. Thompson states that "in 1699 the export of wool and woolens from the colonies . . . was forbidden. In 1731 an inquiry of the Board of Trade ascertained that the colonies were making linens, woolens, iron wares, paper, hats, and leather, and even exporting hats. The carriage of these, even from one plantation or colony to another, was forbidden."

"Besides compelling the colonists to *sell* their produce exclusively in the English markets," McCulloch says, "it was next thought advisable to oblige them to *buy* such foreign articles as they might stand in need of entirely from the merchants and manufacturers of England." For this purpose it was enacted in 1663 that "no commodity of the growth, production, or manufacture of Europe shall be imported into the British plantations but such as are laden and put on board in England, Wales, or Berwick-upon-Tweed, and in English-built shipping, whereof the master and three-fourths of the crew are English."

It will be perceived that the acts of Parliament from which we have quoted were intended to benefit the manufactures of England by destroying those of the colonies, and that they aimed to secure to her "the absolute monopoly of her colonial commerce." They were successful in accomplishing the objects sought, but they formed no insignificant part of that "long train of abuses and usurpations" which led to independence.

E. B. Bigelow condenses into the following sentences the legislation of Great Britain concerning the introduction into the British Islands of cotton manufactures from India, once a threatening rival of British woolens:

In 1678 strong remonstrances were made in Parliament against the admission of Indian calicoes, chintzes, and muslins, on the ground that they were ruining the woollen trade. In 1700 an act was passed prohibiting the importation of the articles just named, under a penalty, upon the seller and buyer, of £200. In 1720 another concession was made to the demands of the woollen interest. Under the act of this year no person could wear a printed calico without the payment of £5 for the privilege, while the seller of the

article was mulcted to the extent of £20. Sixteen years later the act of 1720 was so far modified as to legalize the use of *mixed* prints, while the prohibition against using calicoes made wholly of cotton remained in full force. This state of things lasted nearly forty years longer. In 1774 Parliament passed an act sanctioning the manufacture of cotton, and making it lawful to use or wear any new fabric made wholly of that material.

An excise duty of "three pence for every yard in length, reckoning yard-wide," was, however, imposed on "the said manufactured stuffs wholly made of cotton spun in Great Britain when printed." This duty was for the benefit of the woolen interest.

The British tariff in force in 1787, the year in which the constitution of the United States was framed, was a very restrictive measure. The word "prohibited" appears in it opposite to many leading productions of other countries, including iron in hoops, rods, cast, and wrought; steel, brass, and copper manufactures; manufactures of silk; boots and shoes; gloves of leather; leather itself; hats. In the same year paper was subject to a duty of 75 per cent., and cotton manufactures, except from within the limits of the East India Company's charter, to a duty of 44 per cent.

A favorite method of encouraging British manufactures was by the payment of government bounties on exports. For instance: In 1819 (the importation of silk goods being still prohibited) an act was passed to grant an additional bounty on the exportation of certain silk manufactures of Great Britain. In 1821 an act was passed to grant bounties on the exportation of certain mixed goods of silk and mohair and mohair and worsted, the manufacture of Great Britain. In 1820 an act was passed to continue an act granting a bounty on certain British and Irish linens and reducing duties on raw linen yarns imported. A bounty on the export of British wheat was paid from 1689 to 1815.

The nature of the protection which England extended to her iron industry is briefly explained by Dr. Elder as follows: "Iron imported in foreign vessels was charged, as early as the year 1710, with a duty of £2 10s. per ton, which was raised at successive periods, till in 1819 it stood at £6 10s. in English and £7 18s. 6d. in foreign vessels. This was adequate as well as earnest protection of the domestic manufacture, for as early as seven years after the last-mentioned date England was actually producing her own iron at £3 13s. cheaper than the cheapest of her competitors in all Europe. Being thus secure against all rivalry in the home market, the duty was reduced in 1834 to £1 per ton."

An English writer, Sir Henry Parnell, in his work on *Financial Reform*, gives a summary of a parliamentary return issued in 1829, from which it appears that, in that year,

Protective duties were imposed upon every description of manufacture, of which the following are examples: Thirty per cent.—manufactures of brass, copper, lace, leather, silk, embroidery and needle-work, pencils, pens, sealing-wax, hair of goats, wool, pots of stone, varnish; twenty per cent.—japanned ware, wrought iron, manufactures of pewter, steel, and tin jewellery, baskets, boxes, buttons, haberdashery and apparel, scientific and musical instruments, matting, mattresses, cotton and woollen manufactures; fifteen per cent.—earthen and china ware, some woollen manufactures, tiles; forty per cent.—linen manufactures; fifty per cent.—empty casks; seventy-five per cent.—dressed furs; twenty-five per cent.—watches; upon many other articles there were specific duties, and upon manufactures not enumerated the rate was twenty per cent.

In order to protect agriculture, the following duties were imposed: Bacon, 28s. per cwt.; butter, 20s. per cwt.; cheese, 10s. 6d. per cwt.; hay, 24s. per load; hops, £8 11s. per cwt.; hemp seed, £2 per quarter; hemp, undressed, 4s. 6d. per cwt.; lard, 8s. per cwt.; mules and asses, 10s. 6d. each; horses, £1 each; rape and linseed oil, £39 18s. per ton; peas, 7s. 6d. per bushel; potatoes, 2s. per cwt.; seeds, £1; tallow, 3s. 2d. per cwt.; tares, 10s. per quarter; timber, £2 15s. per load; wheat, £1 5s. a quarter to 1s., according as the price rose from 61s. to 70s. a quarter; barley, 13s. 10d. to 1s., according as the price rose from 32s. to 40s. a quarter; oats, 10s. 9d. a quarter to 1s., according as the price rose from 24s. to 31s. a quarter; other grain, flour, and meal on similar scales. The importation of living animals for food, and of beef, lamb, mutton, and pork, was absolutely prohibited. The lowest rate of duty on sugar was 24s. per cwt., with higher duties upon sugar from other sources than our own colonies; tea was taxed 100 per cent. on its value; and coffee from 6d. to 1s. 3d. per pound, according to the place of its origin.

It was not until 1842 that the British government began to abandon protective duties, but many years elapsed before their general repeal was effected. Indeed, so lately have protective duties disappeared from the British tariff, that the wisdom of their repeal can not be said to have been fully tested by results. Down to 1859 protective duties were still retained on various foreign commodities entering British ports, and in the tariffs of 1851 and 1854 these duties were very prominent. A most significant feature of the tariff which was in force in 1819 is the large number of articles which were absolutely prohibited from entering British ports, or were subjected to a duty of one-half their value. The United States has never prohibited the importation of any commodity, except in time of war. An examination of British tariffs down to 1860 will well reward the reader who has been led to

believe that Great Britain has been steadily practicing free trade with all the world from a "time to which the memory of man runneth not to the contrary."

A protective duty on silks, boots and shoes, and gloves continued down to 1860; on timber down to 1866; and on sugar, for the benefit of English refiners and colonial producers, down to 1874. Even in 1876 it can scarcely be said that all protective duties have disappeared from the British tariff, for the duty on beer and spirits, which benefits English brewers and distillers, is still imposed. The protective policy is also retained in the acts of Parliament which every year grant large subsidies to English steamship companies, enabling them to carry the commerce of Great Britain to every port in the world in successful competition with other nations. These subsidies are attended with many important benefits to British trade. In 1871 Hon. William D. Kelley said of them: "England's enormous annual subsidies to steamship companies are part of an ingenious system of protection by which she hopes to maintain a monopoly of shipbuilding and the carrying trade. She thus pays part of the freight on foreign raw materials used by her manufacturers, and the fabrics and wares they export. These subsidies amounted last year, as was stated by the Chancellor of the Exchequer in his speech of April 20, 1871, when presenting to Parliament his budget for this year, to £1,225,000, or over \$6,000,000."

This is not free trade, but *protection*—protection in 1876.

The principle of protection for the manufactures of England, Scotland, and Wales is also apparent in the dealings of Great Britain with her present colonies, for her influence is steadily exerted, as it was with her American colonies in the last century, to prevent them from manufacturing for themselves. We may go further, and remark that, in seeking through commercial treaties and other less reputable instrumentalities to prevent other nations from developing their resources, the same principle of protection to her own industries is found to constitute the cornerstone of all the diplomacy of the British nation.

With such a record, and especially in view of the fact, already shown, that the products of other countries are systematically taxed for the benefit of the British exchequer, the claim that British industries flourished generations ago *in spite of protection*; that they are not now protected; and that British markets are free to all the world, is not sustained.

THE PRESENT COMMERCIAL POLICY OF GREAT BRITAIN.

Although Great Britain has not abandoned her protective *policy*, it may be assumed that, since the passage of the tariff acts of Sir Robert Peel in 1845 and 1846, and their various supplements, she has virtually abandoned protective *duties*. The causes that led to the agitation against these duties, which culminated in the repealing acts of the last thirty years, may be briefly stated. They are properly divisible into three heads.

1. Import duties on competing products had ceased to afford much protection to British manufacturers. The advantages possessed by them over the manufacturers of other countries, in cheap coal, cheap iron, cheap skilled labor, abundant capital, improved machinery, accumulated experience, and extensive workshops had made them practically unassailable by foreign competition in their own markets; while the adherence by their government to a tariff of duties nominally protective of their interests gave excuse to other nations to place effective restrictions upon British trade. The repeal of duties which no longer afforded protection might lead to the repeal by other nations of duties which *did* protect. This motive was boldly avowed in a noted petition from London merchants for a reduction of duties, which was presented to the House of Commons, May 8, 1820, wherein it was represented

That a declaration against the anti-commercial principles of our restrictive system is of the more importance at the present juncture, inasmuch as, in several instances of recent occurrence, the merchants and manufacturers of foreign countries have assailed their respective governments with applications for further protective or prohibitory duties and regulations, urging the example and authority of this country, against which they are almost exclusively directed, as a sanction for the policy of such measures. . . . That nothing would tend more to counteract the commercial hostility of foreign states than the adoption of a more enlightened and more conciliatory policy on the part of this country.

At the time this petition was presented, the superiority in capital and machinery of British manufacturers over all rivals, except in a few special branches, was everywhere conceded. This superiority was in no wise lessened in the years which elapsed before the prayer of the petitioners was answered in the repealing acts of 1845 and 1846 and their supplements. It may be added that the "hard times" in the United States and other countries in 1837 and succeeding years, which injuriously affected British exports, together

with the passage of our protective tariff act of 1842, fortuitously strengthened the demand of British manufacturers for a commercial policy that would promise to open to them the world's markets. They could stand alone; the manufacturers of other nations could not.

2. The manufacturers of Great Britain would be greatly benefited by the removal of duties on raw materials which they were compelled to obtain abroad. Some of these duties were protective of domestic interests, but the majority were not, and all of them militated against the prosperity of the powerful manufacturers, upon whose shoulders rested the commercial supremacy of all Britain.

3. The repeal or radical modification of protective duties on agricultural products, it was claimed, would have a tendency to cheapen the necessities of life to a people who were unable to produce their own food, and who were therefore compelled to make large importations annually to supplement the deficiency in their harvests. It would also have a tendency to lessen the clamor of British workingmen for an increase in their wages—a matter of considerable importance to the manufacturers. It was, therefore, legislation of the same class as that which repeals duties on the raw materials of manufactures; and, as it cheapened or tended to cheapen the cost of labor, it was eminently a measure of *protection* to the British manufacturer, and not to him a free-trade measure at all.

Naturally, the repeal or modification of these duties was resisted by the landed interest, but the unusually short grain crops in 1837, 1838, 1839, 1840, and 1841, and again in 1845, and the failure of the potato crop in 1845 and 1846 conspired with the pressure from the manufacturers in favor of cheap bread and cheap labor to abolish most of the duties and materially reduce the remainder. But the English landholders lost nothing by the repeal. They increased their rents and the price of some agricultural products, and in a little while the workingmen were no better off than they were before, as their present condition testifies.

To these three causes did the free-trade movement in Great Britain owe its inception and success. Except to the landholders, whose fears were afterwards proved to be groundless, no prominent interest was threatened with serious disturbance by the change. The government would lose the revenue from agricultural products, but it could not lose much from the repeal of hundreds of

other duties which had been as little productive of revenue as of protection. Great Britain had ceased to import the manufactured products of other countries which competed with those of her own people.

The navigation acts were greatly modified in 1849 and in subsequent years. Foreign ships were permitted without restriction to carry foreign merchandise to British ports and to receive return cargoes. Ships not of British build were permitted to be registered as British ships and bear the British flag if wholly owned by British subjects. The first concession was made to aid in the extension of British trade, and the second signified nothing, for it had been demonstrated that British-built ships were as cheap as any that could be bought.

We here pause to emphasize the true character of the fiscal revolution which has been briefly explained. It was emphatically a measure for the promotion of the foreign trade of Great Britain. Her carrying trade (always a source of large revenue to her people) and her manufacturing interests it was hoped would both be benefited by it. It did not for one moment embrace the philanthropic idea which has been so zealously claimed for it of advancing the prosperity of all nations through the establishment of a policy of unrestricted freedom of trade, which no modern nation ever has adopted or ever can adopt. It was purely a trade measure, adopted through the exigencies or supposed exigencies of the British people, and for their benefit against all the world. Upon this ground its justification should honestly be made to rest. There is no occasion in the facts—there is certainly no excuse in morals—for avoiding or obscuring the real issue. A nation has the undoubted right to do that which is best for its own interests, provided it respects the rights of other nations. Great Britain has a right to foster her industrial interests either by protective duties or without them, as she may elect, and she need not in defense of that right affect a philanthropic virtue which no nation is expected to possess.

The persistent repetition of the plea in behalf of British free trade, that it is a philanthropic policy which will benefit the universe and not Britain only, compels attention to the attitude of industrial hostility which the British nation has borne toward other nations and its own colonies and dependencies in very recent as well as in more remote years, and challenges the repetition of facts many of which otherwise had best be forgotten. This hostility has been

alike under protection and under free trade. National characteristics are not changed by acts of Parliament. If British merchants and manufacturers and statesmen have shown any philanthropy in their intercourse with other nations, where may it be found? We have shown what it was in the last century, when the American colonies were its petted favorites: let us see what it is in the nineteenth century.

The treatment which Ireland has always received from England is a subject with which every schoolboy is somewhat familiar; but not even every adult reader fully realizes that the present impoverished condition of that unhappy country is the direct result of a policy of repression and stamping out which England pursued toward the *manufactures* of Ireland in the seventeenth and eighteenth centuries. "The production of woollen cloths in Ireland was restrained in 1698, and three years later their exportation from the island, except to certain ports in England, was wholly prohibited." The Right Hon. Sir John Barnard Byles, himself an Englishman, states that "for a long course of years Ireland's manufactures were systematically discouraged and stifled, while England's were, at the same time, protected and cherished." At the beginning of the present century, January 1, 1801, when the political union of Ireland with England was formally completed, provision was made, in the Act of Union, for abrogating such measures of protection as had yet retained upon Irish soil a few important manufactures. These measures of protection were the acts of the Irish Parliament, which the Act of Union abolished. Judge Byles states the effect of the abolition of protective duties as follows: "Before the Union there were under protection Irish woollen manufactures, Irish carpet manufactures, Irish blanket manufactures, Irish silk manufactures, Irish calico manufactures, Irish flannel manufactures, and Irish stocking manufactures. *These manufactures are now smothered and extinct.*" English protected manufactures first crushed them, and English free trade, permeating every Irish town and hamlet, next prevented all hope of their recovery. In 1822, all protection having then been withdrawn from Irish manufactures, but not from *any* English manufactures, there was a famine in Ireland, and great suffering resulted. William Cobbett says "there was food enough, but no money to purchase it." Large numbers of the Irish people were without employment, through no fault of their own. In 1841 the population of Ireland was 8,199,153; in 1871, through famine

and emigration, it had fallen to 5,402,759. Famine and emigration in a land capable of supporting twenty millions of people might have been prevented if only Irish manufactures had been preserved and fostered. But England decreed their destruction, and destroyed they are. This is her philanthropy toward Ireland to-day.

The policy of the British government and people toward India has been equally philanthropic. That wonderful country once possessed an industry peculiarly its own—the manufacture of cotton into the finest of fabrics. For thousands of years it had existed and flourished. In 1700, as we have seen, the British government prohibited the importation of Indian cotton goods into the British Islands, because they would injure the domestic woolen manufacture. But the cotton manufacture was gradually domesticated on British soil, until, by the aid of labor-saving machinery, and a reduction in 1813 of the Indian duties, Manchester cottons found a market in India, and almost annihilated the native manufacture. Mr. Carey, in his just-published *Letters to the London Times*, states that the cotton manufacture was transferred from India to Great Britain by prohibiting “the export not only of machinery itself, but of all the artisans by whom machines might possibly be made. To this was added the imposition of heavy duties on the import of Indian cottons, coupled with a prohibition of duties of any kind on English cottons imported into India.” If Great Britain had been truly philanthropic, her rulers would have assisted the people of India to improve their mechanical methods, but the crushing-out process suited them better. Anglo-Indian capitalists are now endeavoring to restore the lost prestige of the Indian cotton manufacture by means of modern machinery, and slightly protective duties, but the home government and the free-traders of England give the movement no encouragement, but oppose to it all the obstacles in their power.

The successful efforts of British philanthropists to force the use of Indian-grown opium into China, to the great and permanent injury of its people, and against the wishes of their government, is well known. The rulers of China energetically endeavored to save the Chinese people from the terrible vice of opium-eating and opium-smoking, but the rulers of Great Britain declared war with China in 1840, to compel the opening of her ports to this baneful drug, and in 1842 this “opium war” ended by a treaty which granted the British demand. Later wars between Great

Britain and China have resulted in confirming the same philanthropic privilege to this day.

The philanthropic way in which Great Britain deals with Japan is thus stated by Mr. Carey in the *Letters to the London Times*, already quoted :

A dozen years since, that country concluded treaties with Great Britain, France, and other European powers, closely resembling that with Turkey, and those with other Eastern nations, by means of which they have been so largely barbarized, and so generally ruined. Unused to treaty-making, however, the Japanese authorities wisely inserted provisions by means of which it was supposed to be secured that those now made were to be replaced by others at the close of the first decade. That time arrived some four years since, and down to the last hour it was supposed that new treaties would be made. Not so, however, Britain at once asserting that there could be no "revision," except with the consent of both parties, and that, until such consent should have been obtained, the original treaty must remain in force. From that time the Japanese government has stood in the position of being compelled to submit to all the provisions of a treaty whose maintenance cannot fail to result in utter ruin ; or, on the other hand, risk being involved in war with a nation that has always in the Eastern seas more vessels of war than would be required to close at once all that great domestic commerce now carried on by means of boats and ships between the various towns and cities, islands and provinces of the empire. Here, as usual in all cases in which Britain is interested, the question is one of might, and not of right.

In 1816 Lord Brougham, in a speech in Parliament, advocating the increased exportation of British goods to the United States, declared that "it was well worth while to incur a loss upon the first exportation, in order by the glut to stifle in the cradle those rising manufactures in the United States which the war has forced into existence contrary to the natural course of things." In 1843 the *London Spectator* thus expressed the prevailing sentiment of all England : "More general considerations tend to show that the trade between the two countries, most beneficial to both, must be what is commonly called a *colonial* trade—the new-settled country importing the manufactures of the old, in exchange for its own raw produce. In all economical relations, the United States *still stand* to England in the relation of *colony* to *mother country*."

Mr. Robertson, a member of the British Parliament, declared, during the incipency of the free-trade agitation in England, exactly what free trade for the United States and other countries meant. He said : "It was idle for us to endeavor to persuade other nations to join with us in adopting the principles of what was called free

trade. Other nations knew, as well as the noble lord opposite and those who acted with him, what we meant by free trade was nothing more nor less than, by means of the great advantages we enjoyed, to get a *monopoly* of all their markets for our manufactures, and to *prevent them*, one and all, from *ever becoming manufacturing nations*."

In 1854 a British Parliamentary commission still further explained the meaning of free trade as follows: "The laboring classes generally, in the manufacturing districts of this country, and especially in the *iron and coal districts*, are very little aware of the extent to which they are often indebted for their being employed at all to the immense *losses* which their employers voluntarily incur in bad times in order to *destroy foreign competition*, and to *gain and keep possession of foreign markets*. . . The large capitals of this country are the great instruments of *warfare* against the competing capital of foreign countries, and the most essential instruments now remaining by which our *manufacturing supremacy can be maintained*."

The course of the British government and ruling classes toward this country during our civil war is another illustration of their philanthropy. A dismemberment of the Union would have promoted British trade, especially with the South; and to serve this miserable purpose a large number of the aristocracy and the trading classes of Great Britain would have rejoiced in the downfall of this great nation. How much they loved the people of the South, to whom, for the purpose we have indicated, they gave their sympathies during the war, may be inferred from a remark in an article on cotton in *The British Trade Journal* for February, 1876, as follows: "We trust, nevertheless, that under no circumstances will Bombay cease to produce more and more of the raw material every year, so that the spindles and looms of the *mother country* may ultimately be rendered to a great extent *independent of Transatlantic fibre*," that is, of Southern cotton.

The British policy of interfering with the industrial interests of other countries is well exemplified in the declared purposes and official utterances of the new British Iron Trade Association. This organization, composed of the leading ironmasters of Great Britain, was completed in December, 1875, when one of its "general objects" was declared to be "*to attend to all matters connected with foreign tariffs* . . . that may have a bearing upon the position of the iron and steel trades." Mr. G. T. Clark, the president of the

Association, at its first general meeting held at London in February last, stated it to be the duty of "those concerned in the British iron trade to keep a close watch upon commercial treaties and the tariffs of foreign states, to see that the former be acted upon, and the latter *grappled with* where not absolutely prohibitive." The exact meaning of these declarations can not be misunderstood. They mean direct interference with the legislation of other countries, that British manufacturing interests may be benefited through the destruction of the competing industries of those countries. That such interference has been quite recently attempted in the legislation of this country is plain from many circumstances which are fresh in the recollection of our readers.

The Cobden Club is an association of several hundred English noblemen, manufacturers, and others, organized in 1866, the avowed object of which is interference with the protective policy of other countries, that the introduction and sale of British goods may be facilitated. It is a leading professor of that peculiar philanthropy which we have been reluctantly compelled to notice and expose in this chapter.

Such has been and such is the commercial policy of Great Britain. It is the policy of promoting British trade and British aggrandizement by crushing out the industries of other nations. When protection served to advance this policy, Britain held fast to protection; when free trade promised to advance it more rapidly, she established free trade. Under which flag she will sail her ships and man her factories a generation hence no one knows: she may restore protective duties on some commodities within the next five years: but to the credit of modern civilization be it said she is the only professedly Christian nation that ever prosecuted a merciless industrial warfare against other nations under the hollow pretense of seeking only to strengthen the bonds of a common brotherhood and lighten the burdens of a common humanity.

THE INDUSTRIAL ADVANTAGES OF GREAT BRITAIN.

Let no man hastily predict the downfall of British industries. We have shown that, in the change in the fiscal policy of Great Britain which was inaugurated by the legislation of thirty years ago, British manufacturers gained much and surrendered nothing. Thanks to the protective policy, and to the advantages which Nature and Art had alike lavished upon their tight little island,

they could at last successfully defy even-handed competition in their own home markets; the raw materials which they needed they would now obtain cheaper than before; food for their workingmen would at least be more abundant. The new policy could not close to them any foreign markets which they already possessed, and it promised to open to them new markets. Their advantages over all other rivals were indeed many. But they were also many and important under the old policy, of which the new policy was but the legitimate outgrowth. A more particular inquiry into the exact character of the influences which had made the British Islands in 1846 the workshop of the world will show the perfect harmony of interests which linked the old policy to the new and the new to the old.

Primarily, the United Kingdom owes its commercial and manufacturing importance, in the past as in the present, to those sterling national characteristics which have made English statesmanship, courage, skill, industry, and perseverance household words in every land under the sun. The English people are a superior people in almost every sense, and they are ably seconded in all their aspirations and enterprises by the canny and ultra-loyal Scotch, and by the better class of the Irish and the Welsh. There is not to-day on the face of the globe a more compact, sturdy, active, resolute, and intelligent population than the ruling classes of the British Islands. They are the Romans of modern times. Imbued with an intensely national spirit; endowed with wonderful intellectual activity; enterprising and adventurous; intolerant of opposition, and imperious in temper, they might be expected to succeed in making other nations tributary to their greatness, and this they have done. Such a people could not always *follow* in the march of empire, as they did down almost to the days of Elizabeth. To-day England is a leader of nations. She has sometimes failed in her efforts to promote the national glory, as when her statesmen and soldiers met kindred blood in our Revolutionary struggle, but in the main she has been a conqueror. War, diplomacy, and foreign commerce have each in turn served her ambition, and she has never hesitated to use that instrumentality which would serve it the best. And she has never allowed her religion to interfere with her business!

Next to the superior national characteristics which have made England a leader of nations, it is clear that she is greatly indebted, first, to her insular position, which compelled her to become a maritime power or submit to be the plaything of bolder sailors,

and, second, to her fortunate command of great natural resources. Centuries ago her flocks of hardy sheep, which fed upon pastures unfitted for other husbandry, furnished the best wool in the world—"the precious wool" of her rude manufactures and her infant commerce. In later years her vast supplies of mineral coal gave her cheap fuel for her woolen factories and her iron furnaces. A century ago her conquest of India enabled her to transfer to British shores the profitable cotton manufacture. Accompanying these later acquisitions was a spirit of mechanical invention, the results of which were carefully guarded, and which gave to English manufacturers labor-saving machinery that added immensely to the productive power of the nation and secured for its cheap products a favorable reception in the world's markets. If we add the influence produced upon the prosperity of British trade and manufactures by the protective policy, and by the constantly accumulating capital resulting from centuries of faithful adherence to that policy; and if we add that the laboring population which this capital employs has always been paid low wages, we will have the prominent and controlling elements in securing the industrial supremacy of the English nation.

Men cast in a Roman mould; foreign commerce; wool and woolen manufactures; cheap fuel; cheap iron; the manufacture of cotton; protection to all branches of home industry, and abundant capital and cheap labor: these are the elements that have made the greatness of England in the past. If it shall appear in the future that she has to-day touched the zenith of her prosperity, the bar to her further progress will doubtless be found in general causes affecting the progress of the human race, rather than in any deterioration of English enterprise or skill, or decay in her natural resources. It is safe to assume that two of these general causes are now actively at work, namely, the increasing strength of the protective policy and the spread of republican principles in other countries. Through these influences greater intelligence, greater freedom, and greater self-reliance will be promoted, and they will lead the way to a larger development of national resources and to a diminished demand for the staple articles of English manufacture. The general use of labor-saving machinery can not much longer be restricted to the comparatively few nations which now enjoy a monopoly of its benefits, and when the inventions that think become everywhere domesticated one of England's greatest advantages will permanently be lost to her. But her immense capital,

her mammoth factories and workshops, her cheap labor, her powerful fleets, and the indomitable spirit of her people will remain, and with them will remain the material greatness of England, although her industrial domination of other nations may be lost.

American manufacturers and workingmen should not delude themselves with the thought that the "decline and fall" of the industrial power of England has commenced. Her tables of imports and exports during the past ten years tell no such tale. Her leading statesmen and journalists and political economists never hint of such decay. Her part in the Philadelphia Exhibition of 1876 shows that her manufacturers have lost none of their old-time energy and business sagacity. If her general prosperity is now under a cloud, so is that of most other countries. The present paralysis of industry is world-wide. There may be misery and wretchedness in tens of thousands of British homes; there may be silence like that of the grave in hundreds of British rolling mills and factories and workshops; Belgian iron may be freely sold in English markets; the cotton goods, the cutlery, the tinware, and a hundred other products of American manufacture may find a market on English soil: all this and much more may happen before England will cease to be a powerful commercial and manufacturing rival of other nations. Through her diplomacy she will here and there succeed in effecting commercial treaties which will enable her to maintain her present hold upon profitable markets. By means of her abundant capital she must for a long time continue to act as the world's banker, thus compelling financially weak nations to pay her tribute and buy her products. Having the lion's share of the carrying trade of the world, she will long take the lead of all other nations in effecting the world's commercial exchanges, which must thus inure to the benefit of her manufacturers. So long as she has within her own borders an abundant supply of the raw materials of staple manufactures, or is able to procure them cheaply, her colossal capital and her cheap labor and her extensive machinery may be expected to produce those manufactures as cheaply as other nations and cheaper than many of them.

The possession of superior industrial advantages is a reflection which is constantly present to the British mind. McCulloch, in his *Commercial Dictionary*, says: "We employ ourselves in those departments of manufacturing industry in which our command of coal, of capital, and of improved machinery *gives us an advantage.*" The *London Times* recently declared: "We produce many articles

which the nations of the earth require, and which *we can sell cheaper than other countries.*" More recently, speaking of the British iron trade, it remarked: "It may be safely affirmed that, having regard to natural resources, no country has yet practically exhibited equal advantages to those of Great Britain. Other countries, geographically, may possess large deposits both of iron ore and coal, but in none have they been shown to be so concentrated in space and available for utilization as in our own country. This concentration and the proximity of the deposits to the seaboard of so great a maritime country are among the *chief advantages* which we enjoy." In 1866 Mr. Gladstone, in a speech in Parliament on the budget, declared that "during the last twenty-five years British commerce "had trebled, mainly in consequence of our mineral treasures. It was important to bear in mind that it was not the quantity of our coal, but its production *at a low price* that had given us the start." Mr. Thomas Brassey, in his *Work and Wages*, says: "English travelers in the East, who have examined the European goods displayed in the bazaars of Beyrout and Damascus, will have been pleased to discover an English stamp on every bale of cotton goods. . . . It is solely by our *lower prices* that we have secured the *monopoly* of the Syrian market." Mr. G. T. Clark, president of the British Iron Trade Association, stated in his inaugural address that "the very existence of England as a power of the first class, if not as an independent power at all, depends upon her being able to hold her own in the manufacturing world, and especially in the manufacture of iron and steel. Her function for about a century has been to *undersell* other nations in the markets of the world. Her trade was created by the peculiar skill of her sons, combined with the *moderate cheapness* of their labor."

It has been a subject of frequent remark during the past few years that the natural resources of Great Britain for the manufacture of staple articles of commerce are rapidly becoming exhausted, as, for instance, her supply of coal and iron ore. We do not hesitate to express our surprise that serious importance should ever have been attached in England or elsewhere to the predictions that have been so current upon this subject. Well-informed Englishmen do not share to-day the apprehensions that were entertained three years ago by many of their countrymen. In his *Notes of a Visit to Coal and Iron Mines and Ironworks in the United States*, Mr. I. Lowthian Bell, the highest authority among English ironmasters, says: "The mineral resources of that country [the United States]

are of unquestionable extent, *but so are our own*, and they will remain so for *centuries to come*."

It has been officially ascertained that the supply of coal in England, Scotland, and Wales will be equal to all probable demands that will be made upon it for at least a hundred years to come, and beyond that period we surely need not extend our inquiries. Many circumstances tend to the conclusion that these demands will not be so great as they have been. The enhanced price of British coal in the years immediately following the termination of the Franco-Prussian war led to economy in its use, which will doubtless be continued. Various scientific innovations in the utilization of heat, such as the Siemens furnace, and in the simplification of methods, such as the Bessemer process, have also greatly contributed to lessen the demand for coal in the manufacture of iron and steel and some other products. In 1873 the proportion of the coal mined in that year in the United Kingdom which was consumed in the iron manufacture was twenty-eight per cent. Since 1872 the production of pig iron in the United Kingdom, and presumptively of other forms of iron and steel, has steadily decreased, so that, with the scientific innovations referred to, there has already resulted a considerable diminution in the demand for coal in the British iron trade. Other leading industries of Great Britain are also using less coal now than three years ago, because less actively employed. The price of coal has fallen almost to a level with that which prevailed before the rise in 1871. Again: about one-tenth of the coal mined in Great Britain is now exported to foreign countries. With vast supplies of coal either developed or in course of development in every quarter of the globe, it is a fair presumption that the British Islands will not long be called upon to send abroad so much of their coal product.

Nor need there be any fear entertained that the blast furnaces of Great Britain will ever fail to secure a supply of cheap iron ore. The native supply does not now meet all the requirements of the trade, and a million tons of foreign ore are annually imported from Algeria, Spain, and Italy, because it is very rich and can be obtained at very low prices. There are no signs of exhaustion of the native supply; it is abundant and easily obtained; and the rich foreign mines mentioned have just commenced to part with their treasures. The *London Times* has said that the concentration in Great Britain of large deposits both of iron ore and coal and the proximity of these deposits to the seaboard of so great a maritime

country are among the chief advantages which the British people enjoy. It might also have said, with equal truth, that other countries, lying very near to Britain, are ready to supply her with rich ores at low prices, and that the maritime freight charges on these ores are also low. The British iron manufacturer pays no such charges for freight on foreign ores as American iron manufacturers pay on the ores that are brought only short distances to their furnaces by rail.

The whole subject of the exhaustion of British resources appears in a light far from serious when viewed in connection with the well-known fact that the British Islands do not produce one pound of cotton and yet manufacture more cotton goods for foreign markets than all other countries. These Islands are a great *workshop*, and their ships and the ships of the world will always bring to them those raw materials which they do not themselves produce, and for which their people will exchange their manufactured goods on such terms as will yield them two profits—one on the goods sold, and the other on the raw materials to be manufactured.

Equally lacking in a clear perception of all the conditions of British industry is the prediction sometimes heard that the wages of labor in Great Britain can never again fall to so low a point as they reached before the recent rise, and that, consequently, the cost to Great Britain of her manufactured products has been permanently increased. A single fact is better than a great deal of theory, and the fact is that wages have *already* fallen in Great Britain to a point almost as low as they touched a few years ago. *Rylands' Iron Trade Circular*, printed at Birmingham, stated in its issue for the 25th of March last that the British people were "gradually coming to a more reasonable range of prices, through concessions which have been *wrung* from ironworkers and colliers." That one word "*wrung*" gives the key to the whole labor problem of Great Britain. The same paper on the 6th of May last told its readers that "the result will be either no work at all or *submit to the inevitable*." The workingmen *must* accept such wages as are offered to them, or starve. Strikes can not help them when the supply of labor exceeds the demand, as is now the case, and relentless lock-outs will enforce the masters' terms.

No: Great Britain shows few signs of industrial weakness or commercial decrepitude. Other nations, if they are true to themselves, and particularly this nation, may rival or excel her best achievements more than they now do, but she will remain their active and defiant antagonist nevertheless.

THE BRITISH WORKINGMAN AND HIS FAMILY.

We now come to consider the effect upon her own people of the industrial warfare which Great Britain has waged against other nations for almost two hundred years. Has this warfare resulted in elevating the men whose sweat has most promoted it? We know that through it the ruling classes of Great Britain have prospered: how have *the masses* been fed and clothed, and in what kind of homes have they lived and died? What have been their opportunities for rising in the world, or even for the enjoyment of an old age of peace and comfort?

It may be accepted as an axiom that that industrial policy is best for a country which best promotes the material welfare of *all* its people. That can not be a wise policy which limits the rewards of labor to the scanty supply of the necessities of life; which narrows the opportunities of employment; which nurses vice and encourages ignorance; and which banishes from the breast of the discontented laborer all hope of better days except that which is born of the thought of some day being able to leave forever the land of his birth. That can not be a wise policy which makes the industrial life of a nation a continuous warfare between employers and their workmen, instead of a peaceful blending of harmonious interests. Judged by this standard, the policy of Great Britain which has sought to crush the manufactures of other nations has not been a wise one for its own working people. It has not been fruitful of the best possible results *to them*. It has not produced the highest moral, social, and intellectual development of which that people are capable. Great Britain has subordinated the best interests of her toiling masses and the highest capabilities of the nation to her unworthy greed of present gain. She has neglected the transcendent glory of steadily advancing the standard of general prosperity at home that she might seize the glittering crown of universal trade. She has succeeded, but her success has been purchased by the degradation of British workingmen. The proof of this assertion is only too abundant.

The opening paragraph of an editorial article in the *Chicago Tribune*, for June 11, 1875, on "English Serfs," states that "there are 5,000,000 or 6,000,000 of sodden human beings in England and Scotland who are serfs and almost slaves. The agricultural laborers have no rights which the rest of the community feel obliged to respect. Practically bound to the soil, reared in the grossest

ignorance, underpaid, almost starved, they are the most unfortunate, unhappy, uncivilized set of people in Christendom. Their career begins in a hovel and ends in a poor-house." John Bright has recently declared that there are one million people who are paupers on the parish in England, and that "another million are perpetually lingering on the very verge of pauperism." Sir S. Morton Peto, in his treatise on *Taxation*, published in 1863, page 242, says: "It is an awful consideration that in England, abounding as it does with wealth and prosperity, there are nearly a *million* of human beings receiving indoor and outdoor relief as paupers in the different unions, besides the still greater number dependent upon the hand of charity. As the population of England and Wales, by the last census, was 20,205,504, it follows that nearly one-twentieth part of our people are subsisting upon charity!" Mr. Joseph Kay, an authorized representative of the University of Cambridge, England, who deals exhaustively with the condition of British workingmen in a work published in London in 1850, says:

The poor of England are more depressed, more pauperized, more numerous in comparison to the other classes, more irreligious, and very much worse educated, than the poor of any other European nation, solely excepting Russia, Turkey, South Italy, Portugal, and Spain. . . . In England and Wales more than half the poor can not read and write, while the majority of the remainder know . . . very little of the Scripture history. . . . Throughout the greater part of Western Europe and North America there is free trade in land, and the peasants can always, by exercising industry, self-denial, and prudence, make themselves proprietors; in England and Wales it is impossible for a peasant to purchase a piece of land. . . . In England and Wales the vast majority of the poorer classes are not allowed to take any part in the election of the members of Parliament. . . . In England and Wales the English church is aristocratic in its constitution, and the people of many districts are suffering from the want of a class of religious ministers who could sympathize with their wants.

By the terms "poorer classes" and "peasants" Mr. Kay means workingmen and farm laborers and their families.

Judge Byles, another eminent Englishman, confirms what Mr. Kay says of the inability of the poor man in England and Wales to obtain a piece of land: "Yeomen living on their own small properties were formerly the principal cultivators in England and Wales. With no outgoing for rent, and none for wages, . . . the well-grown, robust, and ruddy English yeoman was the most independent of mankind. Such was the English subject of Charles

the First. . . . Unhappily the race is now almost extinct: large estates and large farms have absorbed them." The yeomen described by the learned judge have become "almost extinct" because the English government has for centuries maintained a system of land tenure which could have no other result than to enable the rich lord to crush out the small proprietor.

Mr. Kay says: "The word *cottage* has ceased to mean what it once meant—a small house surrounded by its little plot of ground, which the inmate might cultivate as he pleased, for the support and gratification of his family and himself." It has *never* been the policy of the British government to assist its poorer subjects to obtain homes for themselves. It now favors free trade in the sale of the products of the labor of these poorer subjects, but free trade in land for their benefit has ceased to be even a dream: it is an impossibility. In 1844 the *London Times* declared that, "*once a peasant in England, and the man must remain a peasant forever.*"

The *Modern Domesday Book* shows that 12,000 persons own thirty of the thirty-seven million acres of land in England and Wales. About twenty persons own the half of all Scotland. Seventeen persons in England and Wales own more than 50,000 acres each, and three of these own over 100,000 acres each. "The largest acreage is that of the Duke of Northumberland, Alnwick Castle, 186,397 acres, the gross rental of which is £176,044 (\$880,220). There are no less than thirty-two landowners whose rent-roll exceeds, for each, £50,000 (\$250,000), and of these, twelve receive over £100,000 (\$500,000). The highest rent-roll is that of the Duke of Norfolk, Arundel Castle, who, from 40,176 acres, receives the enormous rental of £264,564, or \$1,322,820."

A writer in *Harper's Magazine* for August, 1874, remarks: "The most obtrusive fact in the English social system is the contrast which exists between the enormous wealth of the few and the desperate and hopeless poverty of the many." Lord Napier bore similar testimony in an address delivered a few years ago in London: "The proportion of those who possess to those who possess nothing is probably smaller in some parts of England at this moment than it ever was in any settled community, except in some of the republics of antiquity, where the business of mechanical industry was delegated to slaves."

The *London Fortnightly Review* stated a year ago that "for more than four hundred years" after the dawn of civilization in Europe, namely, from the fourteenth century down to the beginning of the

present century, it was the "*settled policy*" of British legislators that it was "*a crime for a workman to seek higher wages.*" . . . So late as 1720 an act was passed to keep down the wages of the tailors of London and Westminster. Any master who gave more than was allowed by the act was liable to a fine of £5; every workman who asked more was to be imprisoned for two months." Down to 1824 it was a punishable offense at common law as well as by statute in England and Scotland for mechanics to form societies for the purpose of peacefully endeavoring to raise their wages, and down to 1799 restrictions upon the liberty of *the masters* to raise wages voluntarily were retained in British laws. In 1762 the court at Edinburgh found "that the defenders and other journeymen tailors of Edinburgh are not entitled to an hour of recess for breakfast, that the wages of a journeyman tailor in the said city ought not to exceed one shilling per day, and that if any journeyman tailor not retained or employed shall refuse to work when requested by a master on the aforesaid terms, unless for some sufficient cause to be allowed by the magistrates, the offender shall, upon conviction, be punished in terms of law."

The following remarkable statement we take from a paper upon the industries of Scotland, contained in the Report upon our Foreign Relations of the Secretary of State of the United States for 1868.

The lot of the early miners and coal-bearers in Scotland was rendered hard enough by their having to work in the face of many dangers and difficulties, to the removal of which science had not then been applied; but their condition was made more wretched by a system of bondage or serfdom. On entering a coal-mine the workers became bound to labor therein during their whole lifetime; and in the case of sale or alienation of the ground on which a colliery was situated, the right to their services passed to the purchaser without any special grant or agreement. The sons of the collier could not follow any occupation save that of their father, and could labor only in the mine to which they were held to be attached by birth. Tramps and vagabonds, who were not sufficiently wicked to deserve hanging, and on whom prison accommodation would only be wasted, were sometimes consigned by the lords of judiciary to lifelong service in the collieries and salteries. Every man thus disposed of had riveted on his neck a collar, on which was engraved the name of the person to whom he was gifted, together with the date. The collar was intended as a check upon deserters; and constables were highly rewarded when they brought back a fugitive. A collar of the kind referred to may be seen in the Edinburgh Antiquarian Museum.

Though serfdom had a considerable time previously died out, so far as all other classes of workers were concerned, colliers and salters were not liberated until towards the close of the last century; and the custom of celebrating the

anniversary of their emancipation has not yet died out. The act which set them free was passed on the 23d of May, 1775, and was entitled "An act for altering, explaining, and amending several acts of Parliament of Scotland, respecting colliers, coal-bearers, and salters, etc."

Other facts might be cited to prove that it has always been the spirit of the English laws to hedge about with difficulties the efforts of the British laborer to better his condition. In the fourteenth century, when agriculture was regarded with more favor than manufactures, legislation was employed to prevent the sons of agricultural laborers from learning trades. We have elsewhere referred to the laws prohibiting skilled workmen from going abroad in the eighteenth century. It was not until 1871 that trades-unions were legalized in Great Britain. While these organizations can not be wholly commended, it must be remembered that they owe their origin to the *oppression of labor*, and that, but for them, the British workingman would to-day be more of a slave and less of a freeman than he is.

In his *Work and Wages*, Mr. Thomas Brassey, a loyal Englishman, remarks: "So long as the cost of production in this country exceeds the cost of production in other countries, the neutral markets of the world will no longer draw their supplies from England. The demand for labor here will accordingly diminish: the multitudes of people out of employ will be *driven*, under the pressure of *necessity*, to compete against each other for employment; wages will then be in proportion diminished, until we are once more in a position to compete." Labor being the principal element in the cost of most of the commodities which Great Britain sells abroad, the plain inference from this extract is that British workingmen have been systematically underpaid and degraded that the condition of *cheapness*, of which the London *Times* boasts, might be secured.

Judge Byles thus states the inevitable tendency of all efforts to undersell other nations in their own markets: "In the fierce struggle of *universal competition*, those whom the *climate enables* or *misery forces* or *slavery compels* to live worst and *produce cheapest* will necessarily beat out of the market and *starve* those whose wages are better. It is a struggle between the working classes of all nations which shall descend first and nearest to the condition of the *brutes*." The challenge to all the world to produce the cheapest goods may also cause a terrible struggle to preserve even the home market. The Spitalfields silk-weaver told Mr. Mayhew: "We've driven the French out of the market in umbrellas and

parasols; but the people are starving while they're driving of 'em out."

If land were free in England, Scotland, and Wales, so that a part of the population which is now dependent upon factories and rolling mills could be supported by the soil which the aristocracy withhold from cultivation, because it is required for their pleasure; and if Britain did not greedily aim to undersell other nations in their own markets, but were content to supply them only with those products which they do not themselves manufacture, it would not be necessary to beat down the wages of the British workingman. It is because the British workingman is *compelled* to become a factory or a rolling-mill hand, or a collier, *in competition with all the world*, that he is so hardly dealt with. If the way were open for him to become a small farmer; or if the owner of the factory or rolling mill or colliery were not led to reduce wages to the lowest possible limit of human endurance, that he might undersell other nations in their own markets, the condition of the British workingman would be one which all the world might envy, and England would be "Merrie England" in reality to all her people.

But England is not merry with the daily life of a contented and comfortable and well-paid working people. It is on the contrary discordant, rebellious, sullen, imbruted, and miserably poor with the weight of oppression which it has heaped upon these faithful servants of its unworthy ambition. It is a prison-pen; a debtor's prison; a great charity workhouse. John Howard, the philanthropist, went up and down all England in 1774, inquiring into and exposing the inhuman cruelties which characterized the management of English prisons at that day. His great work and the great need of that work are known to the civilized world. But the fact is susceptible of abundant proof that the condition of the workingmen of Great Britain and their families is as deplorable in our day as was that of the inmates of English jails in John Howard's time. Numerous English authorities of undoubted credit may be quoted to prove this fact.

Mr. Kay's book is filled with evidence showing that drunkenness, unchastity, brutality, Sabbath-breaking, poaching, rank ignorance, small and crowded tenements, insufficient food, diseases incident to lack of proper nourishment, and excessively filthy habits and surroundings are *universal* characteristics of the working classes of England, Scotland, and Wales—factory operatives, ironworkers, colliers, and agricultural laborers alike sharing them all. Hovels,

with one or two rooms, and without such conveniences as are required by common decency, form a *vast majority* of the homes of the working people of England and Wales. It is a common practice for the whole family to sleep in one small bedroom, with such results to health and morals as the imagination shrinks from contemplating: the reader of Mr. Kay's book passes over the narrative of these results with a shudder. "Want of chastity is the giant sin of Wales." The responsibility for the low condition of morality and the miserable character of the habitations among the working classes of England and Wales is ascribed by Mr. Kay to "the low rate of wages" they receive, to the neglect of their intellectual and moral training by the authorities, to the utter indifference of the masters to their comfort, and to the want in every breast of a cheerful hope of better days. Mr. Kay states that in Byrnamaur, a town with a population in 1850 of 5,000 souls, "nearly every family is in the employment of Mr. Bailey, the ironmaster, whose works are at Nantyglo. The town reeks with dirt; there are no lamps or effective drainage; and . . . not the slightest step has been taken to improve the mental or moral condition of the violent and vicious community. Neither church nor school has been established by those who employ the people or own the land; and the only step that has been taken for their benefit is that of establishing within a week or two of this time a police station." It is under such circumstances as these that Wales and England are enabled to make cheap iron.

Concerning the condition of the laboring classes of Scotland, an extract from the report for 1869 of the city chamberlain of Glasgow is suggestive. "By the census of 1861 more than 28,000 houses in Glasgow were found to consist of but a single apartment each, and above 32,000 of but two, so that of the whole 82,000 families comprising the city, upward of 60,000 were housed in dwellings of one and two apartments each." Hon. Edward Young, a prominent officer of the United States government, visited Scotland in 1869, and upon his return wrote and published in the *New York Independent* the following: "Having been taught to believe that in respect to education and morals the people of Scotland were far in advance of those of most other countries, it was with profound disappointment and heartfelt regret that I witnessed the painful evidences of ignorance and intemperance among the working classes of Glasgow."

Mr. John Noble, an English economical writer, testifies: "In

1848 . . . the great bulk of the people had ceased to know anything of butcher's meat, except as an occasional Sunday luxury." Professor Thorold Rogers, an eminent English writer on the social condition and history of the English people down to the present day, is of the opinion that "the cost of living in country districts has doubled within the last thirty years, and that some articles of food, once within the reach of all, are now practically unattainable by country people." In 1869 Sir Edward Sullivan, another Englishman, declared that the operatives in the manufacturing districts were not prosperous; "it is a mockery to tell them to thank God for a full stomach, when they are empty! They are *not* well off; never has starvation, pauperism, crime, discontent, been so plentiful in the manufacturing districts." This was in 1869: is their condition any better to-day?

There is a class of working people in Great Britain who should, above all others, be well fed and comfortably housed, for there is no good reason why they should not be, namely, the agricultural laborers. But they are miserably poor. A recent Parliamentary commission, appointed to inquire into the condition of the agricultural laborers, reported that "in Dorsetshire vegetables flavored with bacon fat, or bread and cheese; in Somersetshire, brown bread dipped in cider; in Cheshire, potatoes, or gruel thickened with treacle, are the commonest articles of food." An American, writing from London in 1875, says:

To the modern British rustic plenty of any kind is unknown for at least four-fifths of the year. At harvest-time, perhaps, he can eat and drink his fill, but for the rest of the year his life is spent in a daily fight against the grim giant of starvation. His ignorance of everything outside the circle of his daily pursuits is horrible. His highest conception of earthly happiness is having plenty to eat, or, still more, plenty of ale to drink. . . . If we enter his cottage we find everything clean and orderly, but very poor—only the barest necessities of life, without the smallest article of luxury. His food consists of bread without butter, potatoes, milk, bacon once or twice a week, and at rare intervals a piece of beef or mutton, and these only in quantities barely sufficient to sustain life. In the winter time, when work is scarce, even this meagre supply fails, and he is compelled to fall back upon the parish for assistance.

The London *Times* of October 27, 1874, more than confirms the truthfulness of this picture.

Judge Byles says: "The furies of want, misery, and despair scourge the emigrants from our shores." A writer in *Fraser's Magazine* (London) for January, 1848, says: "The worst horrors

of the slave-trade have been enacted in the flight of British subjects from their native shores."

The brutality which is so prominent a feature of the social life of large numbers of colliers and other British laborers is the direct product of the influences already stated—low wages, no prospect of ever owning a home of any kind, a lack of common-school education, and a lack of suitable religious training. Not even among the American Indians do we find examples of greater brutality than are found in the columns of English newspapers. *The Arcadian* recently summarized some occurrences in the Black Country as follows:

In these districts there appears to be a deep-seated and growing spirit of brutality among the operative classes which displays itself with melancholy regularity, and selects as its principal victims old men, women, and children. Knocking down with savage ferocity, biting, stoning, and kicking to death, are the special forms of "man's inhumanity to man" which find favor in this nucleus of coal-pits, iron-mines, potteries, and cotton mills. Thus, an inoffensive bystander, wishing to put an end to a quarrel at Hanley, Staffordshire, gets a large piece bitten off his ear; a peaceful citizen in Liverpool gets knocked down and kicked to death; a scoundrel at Dukinfield puts on his clogs and dances in them on a woman's head; in one day three husbands are charged with nearly kicking their wives to death with clogs at Salford; the police in many towns have been stoned, stabbed, and kicked; and at St. Helens six ruffianly colliers set upon an old man of eighty and wife, kicking the poor old woman, and, having knocked out one of the old man's eyes, fill it with lime, which they also thrust into his mouth. Even children of the tenderest years do not escape, as is seen by a full-grown man kicking and jumping on a small boy of six years at Preston. These customs seem so established that it is found necessary to invent new terms to describe them, kicking to death with clogs being called "running punce," and kicking in the mouth so as to knock the teeth down the victim's throat being assigned the playful name of "purring," as if it were a kind of kittenish amusement.

Dogs in the Black Country are frequently treated with far more tenderness and consideration than the children of the pitmen. A correspondent of the *London Daily Telegraph*, for 1874, writing from a village in the neighborhood of Sheffield, relates a painful incident of two shoeless, hungry little girls having to do without meat which they needed that a dog of the "retriever breed" might have a good dinner. The same paper has also published recently a disgusting account of a prize-fight between a dwarf man known as "Brummy" and a bulldog named "Physic," in a low sporting-den in Hanley, England. Strange as it may seem, the man brute was declared the victor.

In Great Britain it is a common sight to see women and children engaged in employments to which they are wholly unsuited. In the *London Iron* for May 29, 1875, we read the following :

The public have been frequently horrified by tales of the oppression and demoralization of young women in the nail-making districts, and now, thanks to the Chainmakers' Association, like revelations have been made, in connection with another branch of ironwork, of an evil which has been going on for a considerable period unnoticed until the local press brought it under the eye of the public. Visiting Cradley Heath, in company with a deputation of the above-named association, the special commissioner of the *Wolverhampton Daily News* entered a smithy where he found "a graceful, fair-haired girl of fifteen summers" turning out links of twisted dog-chain. The work, especially in summer, is laborious and continuous—"there is no break, no intermission for a single moment. From the anvil to the bellows, and back again, it goes on from morning to night, day after day." And the days are of eleven or twelve hours each, if not longer. The poor girl thus interviewed scarcely knew, indeed, how long she worked; but she had eighteen chains to make before she finished that day. Neither had she any idea how much she earned, for her mother took the money. There is even worse than this behind. In the summer time we are told the temperature is such that both men and women strip to the waist. Many of these women are married, and the husbands of many of them are living in comparative idleness on the labor of their universally over-worked wives. The commission and deputation visited an immense number of shops in Cradley and neighboring villages, and found in all of them girls and women of all ages working in the same unwomanly way. Some of the poor creatures were far advanced in pregnancy, and there is one pitiful sketch of a poor young woman who had but recently given birth to a child. She looked pale and emaciated, says the writer, but she was blowing her bellows and forging her links as well as her scanty strength would allow, while her baby, wrapped in some rags, lay on a heap of ashes in a corner. There is evidently something requiring instant attention here. For somebody, and not the worker, is reaping the fruit of the labor of these poor women. It was with the greatest difficulty, we are told, that any information as to their hours or the extent of their earnings could be extracted from them. All they could say was that the limit of their task was so many chains a day, and that they worked for some one; but from what could be gathered, some of the poor creatures toil unceasingly at the forge twelve or thirteen hours a day for from 6s. to 7s. a week.

In the *London Times* of Tuesday, September 28, 1875, is published a statement from Mr. Baker, inspector of factories, for the half year ending with April, 1875, which gives extracts from a remarkable report made to him by Mr. Sub-Inspector Brewer on the nail and chain district of the Black Country, from which we quote :

I am continually asked whether I can not do something to stop women's labor, especially in and around Hulesowen (where hundreds work, making the

large nails or spikes), and where it is the order of the day, and is far fitter for men than for women. And these women work night and day, and toil and slave, and for what? Not for the price that straightforward masters would give, but for any price any crafty knave of a master chooses to offer. These women work so long as they can get something to satisfy their half-starving families, while the ought-to-be bread-winner is luxuriating in some public house at his ease. Day by day I am more and more convinced that this women's labor is the bane of this place. Nor do I confine this remark to the nail and chain trade alone. It was only the other day that a young woman, addressing me, said: "I say, master, I wish you would make my man do a little more work, and me less. I married a swell, I did, and ever since I've had to keep him by working in the brickyard, and not only keep him, but find him money to drink." Nor is this state of things confined to the Black Country. At Bromsgrove I heard also of the growing custom of idle, lazy young lads looking out for skilled, industrious wives, in order to obtain an easy life. Things go on smoothly for a time, but then come children, and perhaps sickness, and the idle hand of the legitimate bread-winner has lost its craft, or a course of drunkenness has so debilitated him that he can no longer stand the fatigue and heat. While the mother toils and slaves, the children are left uncared for, to wander, shoeless and in rags, till they are old enough to blow the bellows for their father at a miserable pittance per week—to be kicked and cuffed, hear filthy, indecent, and blasphemous language, and are then sent into the shop amid men degraded by drink and gambling in time to follow the same course. Take, again, the instance of a collier's wife in this Black Country who works at chainmaking about ten hours a day, for which she is paid 8s. a week, though if she had taken her work to an honest master she might have had 12s. Out of this, before she can take any for herself, she has probably to pay for nursing her baby while she works, 2s. a week for her breezes—i. e., firing for her nail-making—and 1s. for the hire of her stall, leaving her half a crown for her subsistence.

The London *Iron*, referring to this subject, said that Lord Shaftesbury (apparently a second Howard) had "taken up the cause of the unfortunate women whose sad condition Mr. Inspector Baker's report has made public." The same paper for July 10, 1875, referred in the following language to the condition of the factory operatives in Manchester:

Previous to the successful termination of the movement for the emancipation of what were by no extravagant figure of speech denominated "white slaves," whose emancipation was as strenuously opposed by their masters as that of the negroes was by theirs, one of the most painful spectacles to be witnessed in Manchester or any of the cotton towns was that presented by the issuing from one of the large factories of its crowd of pale-faced, stunted, and crippled operatives. This, we had hoped, had been since changed for the better, but it is painful to learn from the evidence of Dr. Fergusson, who has been for fourteen years certifying surgeon at Bolton under the Factory Acts,

and who has just been examined before the Inquiry Commissioners, that much still remains to be done before the condition of the factory operative can be considered at all satisfactory. The beneficent intentions of the Legislature appear to have been thwarted on many points, and Dr. Fergusson, who has taken a deep interest in the physical and educational well-being of the working class in his district, certifies, as the result of close observation during the period named, to the fact that a steady degeneration has been going on among the factory population for many years. One cause, and effect as well, of this degeneration was, he said, to be found in the increasing number of children, many of whom were above the statutory age, presented to him to be passed, but who were physically unfit for working full time.

In the evidence taken at Wolverhampton in 1875, before the Royal Commissioner appointed to inquire into the working of the Workshop and Factory Acts, the following was elicited: That boys under ten years are permitted to work in the coal-pits, and boys under twelve years to work full time and all night in the iron trade; that large numbers of young girls and young boys not attending school work regularly in the brickyards; that the employment of women on the pit-banks is their "common industry" in Shropshire and Wigan, and that their work is "very hard—worse than nail and chain making;" and that if women were prevented from working at the collieries and in similar employments "*it would have the effect of making ironstone 7s. per ton more than now, because large wages would have to be given to the men to do the work.*" Mr. John Sparrow, of the Bilston iron works and Millfields furnaces, stated to the Commission that his business was seriously interrupted because he was prohibited from employing boys under thirteen years as *underhand puddlers*. At the first regular meeting of the new British Iron Trade Association, held at London in February last, Mr. Bleckley, of Warrington, a member, remarked that "*he considered it a hardship that children of twelve years of age were not allowed to work in the rolling mills.*" At the Woolen Trade Banquet in New York, December 14, 1870, the Hon. William E. Dodge, president of the Chamber of Commerce of the City of New York, delivered an address, in which he said:

The term, now so generally used, of "pauper labor," which our free trade papers use in such derision, has yet in it a great deal of truth. I have visited many of the large manufactories of England, and have seen evidences of poverty which I trust our laborers will never experience. I have seen in the iron mills of Wales young girls, with their heavy shoes and short woolen dresses, wheeling iron, cinder, coals, etc., at night, among the half-naked puddlers, doing the work done by men and boys in our mills, and receiving for a week's wages what we pay for a day.

Not a score of years ago it was lawful in Great Britain for children as young as seven years to work in cotton factories and at other employments, and thousands of these innocents were thus employed.

It is sometimes alleged as an apology for the destitution and wretchedness everywhere found in Great Britain that leading cities in the United States are themselves great social ulcers—nurseries of pauperism and vice. This statement is correct, but the fact should not be forgotten that a large majority of the paupers and criminals found in our large cities are *foreigners*, who are in no sense a product of our industrial policy or political institutions. They belong to a class of immigrants who are not welcome here, and are incapable of reformation and improvement. If it were possible to prevent them from coming here, the destitution and crime which now prevail in American cities would be largely reduced, and all Europe, Great Britain included, would have more paupers and more criminals than it now has, and all its own.

The vital principle of all trade monopoly is the subjection of labor. Education, religion, the comforts of home, humanity itself, it does not recognize. In the nature of things it can not. These are matters only of sentiment to the manufacturer who is intent only on seizing his neighbor's trade, and sentiment is not business. Mr. Huskisson told the British House of Commons, in his speech on the 28th of April, 1825: "If capital had not a fair remuneration here, it would seek for it in America. To give it a fair remuneration, *the price of labor must be kept down.*" The acts of the British Parliament for the protection of children and shortening the hours of labor met with very great opposition from the masters. The British workingman drinks because British manufacturers offer to him the public house as a substitute for the schoolhouse and the church, and as something better than his cheerless home. They do not as a rule pay him sufficient wages to enable him even to rent, much less to buy, a comfortable house. They never have done this, except when they could not help themselves in the period of high prices which began in 1871; and then the comparative few who were paid high wages were so intoxicated with their extraordinary fortune that they failed to reap any substantial benefits from it: like the millions of slaves emancipated from bondage during our civil war, who were so rejoiced to discover that they were free men and women that they for a time declined to work for themselves with half the energy they had formerly displayed in

the service of their masters. In neither case had there been suitable preparation for so sudden an enfranchisement. The British workingmen whose wages were increased could not at once forget the improvident habits learned in long years of hopeless toiling.

That British workingmen are capable of the highest intellectual, moral, and social development is shown in the career of those Englishmen, Scotchmen, Welshmen, and Irishmen who have escaped from the shores of their native country to become citizens of that Greater Britain this side the Atlantic, which protects its labor, rewards industry, educates its children, elevates the family, has no pensioned clergy, offers its best gifts to all alike, defends the weak, honors virtue in humble life, condemns and punishes corruption in its highest officers, and gives to every one who will work for it a home that no public house can rival in enduring attractions.

THE

INDUSTRIAL POLICY OF THE UNITED STATES.

OUTLINE OF TARIFF LEGISLATION IN THE UNITED STATES.

PROTECTION is a principle and not an expedient. If it is right, the reasons for believing in it and maintaining it should be so clear and so conclusive that its friends will never be tempted to apologize for it, nor its enemies be able to delude the unthinking with stories of its oppressive burdens. There is nothing complicated, nothing metaphysical, nothing hard to understand in the protective policy, and it should be discussed with that simplicity of statement and directness of application which it so eminently admits and so fully invites. It is a plain question of the duty of a nation to encourage the industry of its own people, in preference to the industry of an alien people. It is a question of the duty and interest of a nation to develop all its resources, rather than allow some of the most important of them to remain undeveloped. It is a question of diversified employments and unbounded possibilities for a nation capable of great achievements, rather than a limitation of its powers to such occupations as will prevent it from becoming independent and its people from going forward. This is the protective policy. It is *not* the instrument by which monopolies are to be established, but it is the foe of all monopolies, domestic and foreign, for it encourages the widest competition in productive industry. It is not the instrument by which one class of the community is to be benefited at the expense of another class, for it seeks the common weal by affording employment to all classes. It is not a tax upon one industry for the benefit of another industry, for its design is to impose taxes upon foreign producers

that domestic consumers may obtain cheaper commodities, and this is its effect. It is not a hindrance to commerce, but a help to it, for it stimulates internal commerce when it stimulates the development of resources which could have no value if not exchanged for other products, and it aids foreign commerce when it enables a country, through the competition and increased skill of its people, to produce commodities so cheaply that other countries will be induced to purchase them. It is the policy of patriotism, of progress, of civilization—a policy that defends the weak against the strong, and stands resolutely for one's own against all assailants.

The United States is a conspicuous example of the benefits which result from the protective policy, and it also furnishes in its own history an illustration of the evils which flow from the opposite policy. To a brief examination of the legislation of Congress upon the question of protection to home industry the reader is now invited.

In the early days of the Republic the principle of protection was fully recognized. All the great men who aided in securing our political independence were protectionists—Washington, Adams, Jefferson, Madison, Hamilton, Franklin, and others. The first petition presented to the First Congress, in March, 1789, before Washington's inauguration, emanated from over seven hundred mechanics and other citizens of "the town of Baltimore," who prayed that Congress would render the country "independent in fact as well as in name" by imposing protective duties on foreign manufactures. Other petitions of like character were presented from citizens of Boston, New York, Philadelphia, Charleston, and other places. Within two days after the Presidential vote was counted, Mr. Madison introduced in the House of Representatives a bill embodying the views of the petitioners. That bill became a law; it was our first protective tariff; and it was the *first act* of general legislation passed under the new constitution of the United States. As stated in its preamble, it was enacted "for the support of the government, for the discharge of the debts of the United States, and *the encouragement and protection of manufactures.*" It became a law on the Fourth day of July, 1789, (significant date,) by the signature of Washington. About two years afterwards, on December 5, 1791, Alexander Hamilton, Secretary of the Treasury, presented to Congress a plea for protection to American industry, which is yet regarded as the most statesmanlike paper that ever emanated from the Treasury Department. The recommendations

contained in that celebrated report were approved in various tariff acts without serious dissent down to 1816, when the opponents of protection gained some advantages.

Although intended to be fully protective of our infant manufactures, the early tariff acts were in fact only slightly so. Duties generally did not range above 15 per cent. The disparity between our people and those of Europe in capital and skill and other resources was too great to be overcome by the duties that were imposed. England supplied us with most of our manufactured goods, and to repress our rising industries she offered some of these goods at unremunerative prices. "An immense quantity of merchandise was introduced into the country." "English goods were sold at lower rates in our maritime cities than at Liverpool or London." For many years after the signing of the treaty of peace we were the commercial colony of Great Britain.

In addition to throwing her cheap goods upon our markets, Great Britain continued the policy she had adopted before the Revolution of imposing severe restrictions upon the exportation of machines and tools used in manufactures, and upon the emigration of her skilled workmen. In 1781, 1782, 1785, and 1795 acts were passed by the British Parliament which seriously interfered with the development of American manufactures. The following summary of their provisions is derived from Pope's *Laws of the Customs and Excise*.

(1781.) It was enacted (21 Geo. III., c. 37) that any person who packed or put on board, or caused to be brought to any place in order to be put on board any vessel, with a view to exportation, "any machine, engine, tool, press, paper, utensil, or implement, or any part thereof, which now is or hereafter may be used in the woolen, cotton, linen, or silk manufacture of this kingdom, or goods wherein wool, cotton, linen, or silk are used, or any model or plan thereof," etc., should forfeit every such machine and the goods packed therewith and £200, and suffer imprisonment for twelve months. The like penalties attached to having in custody or power, or collecting, making, applying for, or causing to be made, any such machinery, and the forfeitures were to go to the use of the informer after the expenses of prosecution were paid. The exportation, and the attempt to put on board for that purpose, of "any blocks, plates, engines, tools, or utensils used in, or which are proper for the preparing or finishing of, the calico, cotton, muslin, or linen printing manufactures, or any part thereof," were the next year (1782) prohibited under penalty of £500. The same act interdicted the transportation of tools used in the iron and steel manufactures.

(1785.) The great improvements which had been made in England in all branches of the iron manufacture, and the competition springing up in Europe

and America in the production of raw iron, doubtless prompted the act of 1785 (25 Geo. III., c. 67) to prevent, under severe penalties, the enticing of artificers or workmen in the iron and steel manufactures out of the kingdom, and the exportation of any tools used in these branches to any place beyond the seas.

(1795.) The act of Parliament of 1785, prohibiting the exportation of tools and machinery used in the iron and steel manufactures, was made perpetual by the statute 35 Geo. III., c. 38. It recapitulates the several descriptions of machines, engines, implements, utensils, and models, or parts thereof, employed in rolling, slitting, pressing, casting, boring, stamping, piercing, scoring, shading, or chasing and die-sinking iron and other metals. It included machines used in the button, glass, pottery, saddle and harness, and other manufactures, wire moulds for paper, etc.

At the beginning of the last war with Great Britain, in 1812, all duties were doubled, with the twofold purpose of increasing the revenues and stimulating manufactures. This legislation remained unaltered until 1816, and while it was in force every existing industry of the country was quickened into new life and many new industries were created. There was indeed great need of an industrial awakening. "The war of 1812 found us without manufactures and without machinery. Our people were without the means of producing clothing for their armies, or the material of war."

From 1816 to 1824 duties were much lower than during the war, and as a consequence British manufactures held almost complete possession of our markets. Again we were the commercial colony of Great Britain. Inadequate duties favored her ambition, but she had other advantages in competing with our infant manufactures besides the encouragement extended to her by our timid tariff legislation. These are indicated in the following extract from an article published in New York, in May, 1868, in *The League*, the organ of the free-traders of this country.

Factories were not extensively established until the war of 1812, and were specially protected by the tariff of 1816. This raised the price at first, and was all the encouragement that was desired. But, in a little while, another effect followed: The foreign manufacturers contrived to reduce the cost of producing their goods, by improved machinery and other means, and submitted to a reduction of their profits in order to keep as much as they could of American trade by counteracting the tariff; while the American manufacturers, who could only supply a part of the demand, . . . found their profits diminished by the rise in the cost of labor and subsistence, which was caused by the diversion of labor from its natural channels. To this was added the more abundant capital of the foreign manufacturers, enabling them to give longer credits; their wider access to established markets enabling them to accept a

lower rate of profits, and *the great advantage of being already established*, with machinery all built, trade all regulated, and in the midst of a *superabundant supply of labor, which had no competing opening, and which could therefore be had for the asking, at the lowest wages on which people could live.*

The period intervening between the close of the last war with Great Britain and the year 1824 is frequently referred to as "the era of good feeling" in our political history, but it was an era of discouragement and disaster in our industrial history. The manufactures that had been established and stimulated during the war made no progress after it closed, and many of them actually ceased to retain the vitality they possessed at its beginning. The unchecked importation of foreign goods was the main cause of the industrial depression and financial ruin which marked that gloomy period. In Bishop's *History of American Manufactures* we find the following picture of the condition of the country in 1819 and the years immediately subsequent to it:

The distress became more general and severe than had ever been known, and but little alleviation was experienced for several years to come. The banks suffered from lack of specie. Bankruptcies overtook the mercantile and shipping interests, whose merchandise lay on their hands, and whose ships could neither be employed nor sold, save at ruinous losses. Rents and the value of all real estate were enormously depreciated. Farms were mortgaged or sold at one-half and one-third their value. Factories and workshops were everywhere closed. Manufacturers were forced to abandon extensive and flourishing establishments, reared as if by magic in the last few years, and with their operatives and multitudes of handicraft workmen entered into competition with the cultivators of the soil, and swelled the products of agricultural labor, for which there was no longer a market.

The suffering among manufacturers was more severe in Rhode Island, New York, and Pennsylvania than elsewhere. The number of persons thrown out of employment since the peace was variously estimated at from forty to sixty thousand, and, with their families, the number deprived of support was computed at one hundred and sixty to two hundred and forty thousand. The cities of Philadelphia and Pittsburgh suffered extremely, and the Western country generally participated in the common distress.

In the House of Representatives, on the 11th of February, 1824, the effect of the tariff of 1816 upon the manufactures of the country was stated as follows by Mr. Tod: "The tariff of 1816 had been inadequate. Under it the newly-erected manufactures of earthenware had been the first to disappear. They and their workmen were no more talked of than if they had never existed. In the same way went the most of our glass factories, our manufactures of

white and black lead, our woollens, our hemp. Domestic iron," he said, "had lingered a while longer, and still held a feeble existence, dwindling every year, and gradually sinking under foreign importations. All the devastations and losses of the war had been nothing compared with the devastations and losses of manufacturing capital under the tariff of 1816." On the 28th of February, in the same year, James Buchanan, a member of Congress from Pennsylvania, thus alluded to the prostrated condition of the iron industry in those eastern districts of his State which were open to foreign competition: "Although that portion of Pennsylvania abounds with ore, with wood, and with water-power, yet its manufactories generally have sunk into ruin, and exist only as standing monuments of the false policy of the government. The manufacturers and their laborers have both been thrown out of employment, and the neighboring farmer is without a market." Henry Clay, in a memorable speech in the Senate in 1832, thus characterized the period between 1816 and 1824: "If I were to select any term of seven years since the adoption of the present constitution which exhibited a scene of the most widespread *dismay and desolation*, it would be exactly that term of *seven years which immediately preceded the establishment of the tariff of 1824.*"

The tariff of 1824 gave a new impetus to enterprise and prosperity. It was the first thoroughly protective tariff act passed by Congress in time of peace. In 1828 the duties on iron and steel, carpets, blankets, other woolen goods, edged tools, hemp, flax, and many other articles were still further increased. The protective policy was reaffirmed with emphasis. It is noticeable that the Legislature of New York this year passed resolutions, by an almost unanimous vote, recommending iron to the protection of Congress.

The beneficial effects of the tariffs of 1824 and 1828 are stated in the annexed extract from the speech of Mr. Clay, already quoted: "If the term of seven years were to be selected of the *greatest prosperity* which this people have enjoyed since the establishment of their present constitution, it would be exactly that period of *seven years which immediately followed the passage of the tariff of 1824.* This transformation of the condition of the country from gloom and distress to brightness and prosperity has been mainly the work of *American legislation fostering American industry*, instead of allowing it to be controlled by *foreign legislation cherishing foreign industry.*"

The tariff act of 1832 made some changes in duties, but its general purport was to reaffirm the policy of protection in the most positive terms. In discussing the bill in the House of Representatives, Mr. Crawford and Mr. Stewart, of Pennsylvania, bore additional testimony to the good results which had followed the passage of the acts of 1824 and 1828. Mr. Crawford said: "Manufactories have sprung up throughout the country, not in one town, not in one district, but everywhere, and, like the dews and rains and sunshine from heaven, stimulating everything, and furnishing food for everybody." Mr. Stewart said that the country "had risen to its present high and palmy state of prosperity" under the protective system—"a system which has vindicated its adoption by all its fruits." Mr. Davis, of Massachusetts, also said: "The act which laid the foundation of the great American policy infused the vital principle into the drooping, disheartened spirit of *all laborers*. It restored a discontented community to tranquillity, and caused peace and happiness to pervade this widespread country."

But, in 1833, influenced purely by political considerations growing out of sectional troubles, Congress exchanged the protective policy for one which provided for a gradual reduction of duties on manufactures, to continue until 1842, after which year they should be subjected to a horizontal duty of twenty per cent.

Upon the disastrous consequences of the tariff of 1833 we need not dwell. The country knows them by heart. They culminated in 1837 in one of the severest financial panics in our history, and the five years immediately following that event were indeed "hard times" for the American workingman. The reader of middle age will remember well that in those years the farmer sold his corn and apples and potatoes for twelve and a half cents a bushel, and that a cow and calf in the spring of the year would bring only seven or eight dollars. Agricultural products were rarely exchanged for cash, but were taken to the stores and exchanged for English axes, saws, broadcloths, calicoes, etc., for which exorbitant prices were charged. Domestic manufacturers had very generally put out their fires, and their foreign competitors again possessed the American market. Our importations of foreign merchandise so much increased that they amounted in 1836 to \$189,980,035, an increase of \$63,458,703 over the importations of 1834. "Capital was driven from manufactures to seek investment in agriculture and Western lands." From 1835 to 1842, according to Mr. Carey, there was absolutely no increase in the iron trade of this country.

Labor was nowhere in demand. It was a period of complete prostration and widespread disaster.

The tariff of 1842 again placed the policy of protection in the ascendant, and while it lasted business revived and the country prospered. In 1846 duties were again reduced. Notwithstanding the ameliorating effects produced by the Irish famine, the discovery of gold in California, and the Crimean war, the general effects of the tariff of this year were reactionary and pernicious. The country did not prosper, and manufactures everywhere languished.

The widely-different effects upon all the industries of the country of the tariffs of 1842 and 1846 may be inferred from their influence upon the prosperity of the iron trade. In 1842 the production of pig iron had fallen to less than 230,000 tons; in 1846 Secretary Walker estimated it to be 765,000 tons; in 1847 and 1848, the impetus given to it by the tariff of 1842 having been checked by the tariff of 1846, it increased but slightly, reaching 800,000 tons; in 1849 it fell to 650,000 tons; in 1850 the census showed a still further reduction to 564,755 tons; and it continued to decline until the 1st of January, 1853, when the whole product did not exceed 500,000 tons. The production then began to increase in consequence of the increased demand for iron for railway construction. In 1842 our imports of pig iron from Great Britain were 18,694 tons; in 1846 they had increased to only 24,187 tons; in 1848 they rose to 51,632 tons; in 1849 to 105,632 tons; in 1850, 1851, and 1852 they averaged 75,000 tons; in 1853 they rose again to 114,227 tons, and in 1854 to 160,483 tons.

Professor Francis Bowen, of Harvard College, in his *Principles of Political Economy*, published in 1855, records in the following language some of the effects of the tariff of 1846.

In 1850 and 1851 the average price of flour in our Atlantic seaports was about five dollars a barrel, a price at which the farmers of the West can not afford to export it at all, except for the purpose of relieving a glutted market by a sacrifice. Meanwhile, the sale of British manufactures in this country, to the great depression of our domestic industry, rapidly increased. Our imports of the manufactures of wool, cotton, and iron, for the year ending in June, 1851, had become forty-three per cent., and for that ending in June, 1853, one hundred and twenty-five per cent. greater than they were the year before the alteration of the tariff. To pay for these extravagant importations we were obliged to sell our agricultural products at the reduced price just mentioned, and to export an immense amount of California gold besides. . . . This is not all. Within three years after this reduction of the tariff, the price of the imported iron began to rise rapidly, and in 1852 and 1853 it

was even higher than it had been before the ruin of the home manufacture. . . . The aggregate cost of iron to American consumers, during the eight years preceding 1854, was undoubtedly greater than if the reduction of the duties through the tariff of 1846 had never taken place.

Professor Bowen also states that, "within three years after the effects of the new tariff began to be felt," 167 out of 304 blast furnaces in Pennsylvania were out of blast, being 55 per cent., "and the iron made by the remainder was 49 per cent. less than the quantity previously manufactured." "Within two years after the enactment of the new tariff" the product of the 200 establishments for the manufacture of wrought iron in Pennsylvania was reduced 33 per cent. Professor Bowen estimates that in the whole country "the new tariff threw out of employment 40,000 laborers" in the iron business alone, a large number of persons to be idle in this country thirty years ago.

A leading feature of the tariff of 1846 was the general substitution of *ad valorem* for specific duties—a policy utterly at war with the protective policy, at war with the steady employment of the people, and therefore at war with a true revenue policy. When imports are entered at low prices, duties are low, and the home manufacturer loses the protection which he then most needs: when imports are entered at high prices, duties are advanced, and the home manufacturer is bountifully protected when protection is least needed. If the first-named operation of *ad valorem* duties is experienced, and is continued long enough, there will be few home manufactures with which to compete in the second stage. Precisely this result followed the passage of the act of 1846. British manufacturers threw their goods on our markets at extremely low prices, and while the enemies of protection were pointing to these cheap goods as proof of the wisdom which had framed a purely revenue tariff, behold! many of the manufacturing establishments of the country ceased to manufacture, men everywhere were thrown out of employment, and the brief prosperity succeeding the passage of the tariff of 1842 quickly departed. Then, when domestic competition was no longer feared, because it was no longer hopeful or enterprising or powerful, the prices of foreign commodities were advanced, and the foreign manufacturer reaped a bountiful harvest. We state a painful and humiliating fact within the recollection of most of our readers.

Ad valorem duties on manufactured goods are also objectionable because they invite the foreign manufacturer to undervalue his

goods, thus defrauding the revenue and injuring the domestic manufacturer. The British government, with one exception, now levies only specific duties. For years before it abandoned protective duties its policy was the same.

With a strange fatuity, Congress adopted in 1857 still further modifications in the tariff in the interest of foreign manufacturers, and the panic of that year was one of its consequences. The years 1857, 1858, 1859, and 1860 were four of the most discouraging years in our history.

While the tariff bill of 1857 was under discussion in the House of Representatives, Mr. Granger, of New York, reviewed the tariff legislation of Congress during the preceding forty years as follows :

Since the war of 1812 we have at three different times resorted to a protective tariff to relieve us from financial distress. From 1818 to 1824, with a mere revenue tariff, the balance of trade was against us, and *during that term of six years our exports of specie exceeded our imports \$10,000,000.* This caused the protective tariff of 1824, and the effect of the change was soon felt. Confidence and activity returned, and instead of exporting specie we imported specie to a large amount. The effect was so obvious and gratifying that the still higher tariff of 1828 was enacted—the highest we ever had. Under these two protective tariffs of 1824 and 1828, up to 1834—ten years—the whole country was blessed with a prosperity perhaps never before equaled in this or any other country. In these ten years of protection, from 1824 to 1834, *we imported thirty millions of specie more than we exported, and paid off the debts of two wars—that of the Revolution and of 1812—in all, principal and interest, \$100,000,000.* Next came the descending compromise tariff of Mr. Clay, reluctantly conceded to the opponents of protection. By a sliding scale this tariff brought us down in nine years to a horizontal tariff of 20 per cent. The result was the government soon found itself out of funds and out of credit. The tariff of 1842 was arranged for protection and revenue incidentally. It justified the expectations of its most sanguine friends, but it was allowed only a brief existence. It was said in high places that the principle of protection was wrong, and in an evil hour Congress adopted the maxim, and the tariff of 1842 was repealed, and that of 1846, the present one, substituted. Sir, unless we have a radical change in our tariff laws we shall surely have another financial crash.* We must manufacture more and import less, and keep our specie at home. We have a foreign debt of nearly two hundred and fifty millions of dollars. Protection is vastly more important to us now than revenue, but we can have them both at once, if we will.

In 1861, so prostrated had the country become, in consequence of the legislation of 1846 and 1857, that a return to the policy of generous protection was rendered absolutely necessary, and this

* The change was not effected, and the crash came in that very year.

was accomplished by the passage in that year of the Morrill tariff bill. The bill, as might be erroneously inferred from its date, was not a war measure. It was reported to the House of Representatives March 12, 1860, and passed that body May 10. It passed the Senate February 27, 1861, and was approved by President Buchanan March 2. It took effect April 1. The new tariff formed the first in a series of protective enactments extending over a period of fifteen years, and which are now in force. To the wisdom that inspired and maintained these enactments do we owe the wonderful prosperity of the country during these fifteen years—prosperity achieved despite the destruction occasioned by a great civil war. Under no other policy but one of extreme protection could the country have maintained its energies during the continuance of that deplorable struggle, or so speedily repaired the desolating effects of that struggle after its close. Under no other policy could immigration have increased so rapidly as it has. Under no other policy could the country to-day enjoy the measure of bated prosperity it does. With the panic of 1873 it had nothing to do: Great Britain, France, Germany, Austria, and other countries are now suffering a prostration of their industries as severe as that which has visited this country; but in saving the country from a paralysis of *all* its industries as complete as that which followed the panics of 1837 and 1857 it has had everything to do.

INFLUENCE OF PROTECTION ON PRICES IN THE UNITED STATES.

From the review of our tariff history which has been condensed into the preceding chapter we pass to a more minute examination of the benefits which have resulted to the American people from the protective policy. We will first inquire whether protection has cheapened the prices of commodities to consumers. We affirm that it has. Unfortunately, there does not exist a complete history of the prices which have prevailed in this country since the foundation of the government. We are therefore compelled to compile a fragmentary summary of prices from such scattered sources of information as are accessible.

The wholesale price of heavy domestic sheetings ranged as follows after our cotton manufactures were protected: 1816, 30 cents a yard; 1819, 21 cents; 1826, 13 cents; 1829, 8½ cents; 1843, 6½ cents. English calicoes, made in Manchester, once sold in this country at from 25 to 40 cents a yard. The printing of American

calicoes was not successful until after the passage of the tariffs of 1816 and 1824, because not sufficiently protected. Since the latter year the prices by the package of Merrimack prints, equal to the best Manchester, have ranged as follows: 1825, 23 cents per yard; 1830, 16½ cents; 1835, 16 cents; 1840, 12 cents; 1845, 11 cents; 1850, 9½ cents; 1855, 9 cents; 1875, 8 cents. Domestic brown drillings were first made about 1828 and sold at 15½ cents a yard by the package. In 1860 the price had fallen to 7½ and 9 cents. The domestic manufacture of fine lawns was introduced under the stimulus afforded by the tariff of 1842, and they were first sold in 1847. Similar goods, imported from England in 1846, were sold at from 28 to 30 cents. Both foreign and American lawns were sold in 1847 at from 12 to 15 cents. American lawns subsequently sold as low as 9 cents a yard, and foreign lawns were driven from the market.

On the 14th of December, 1842, Samuel Lawrence, of Lowell, Mass., wrote to Horace Greeley, giving an exhibit of the prices at which Lowell cotton fabrics sold in the three months before and the three months after the passage of the tariff act of 1842, which was approved August 30. The exhibit was as follows: Drillings, before, 7¾ cents per yard; after, 7 cents; common shirtings, before, 5½ cents; after, 5 cents; heavy shirtings, before, 6½ cents; after, 5¾ cents; common sheetings, before, 6¾ cents; after, 6 cents; wide sheetings, before, 8½ cents; after, 7¾ cents; cotton flannels, before, 10 cents; after, 8½ cents.

Woolen shawls, which sold at \$12 in 1857 at retail, sold in 1875 at \$8. Good knit undershirts and drawers—peculiarly an American product—which sold for \$1.25 each in 1857, sold for 50 cents in 1875. All-wool goods for ladies' dresses never were so cheap as they are to-day. Woolen cloths for men's and boys' wear are sold to-day at one-half the prices of thirty years ago. Ready-made clothing, made of good American woollen cloth, is so cheap in late years that no workingman need complain of the price he is charged for a suit by a reputable dealer. In the manufacture of ingrain carpets we excel the English manufacturers, and we have reduced the price at least twenty-five per cent. since the time when they largely supplied our markets. A gentleman of experience in mercantile affairs contributed to the *Chicago Evening Journal* for July 12, 1875, the following statement:

Before a single cotton-mill existed in the United States, imported cotton cloth, of an inferior quality, sold for 22 cents a yard. When a protective

duty of 8 cents a yard was imposed, and cotton-mills built, the competition between the English and American manufacturers soon reduced the price of cloth to 7 cents a yard. So, too, before delaine-mills were built, imported delaines sold at 50 cents a yard, and in 1856 the competition between foreign and home manufacturers had reduced the price to 25 cents a yard, and under the present protective tariff this competition between rival interests has reduced the price of delaines to 15 cents a yard. In black alpacas the same facts are apparent. In 1857 these goods sold for from 75 cents to \$1.25 per yard. At that time all the American manufacturers imitated foreign trade-marks in order to sell their goods. The tariff of 1861 and succeeding years stimulated the manufacture of alpaca, and to-day it sells at from 25 to 45 cents a yard, the quality being fully equal to the high-priced goods of 1857. The prices of cotton goods, coarse woolen goods, boots and shoes, hats and caps, iron and steel rails, and even bar iron and salt are less to-day, in currency, than they were in gold in 1857, and it is pretty generally known that in 1857 prices were exceptionally low for partial free trade eras.

The following table of prices of standard woolen goods was furnished at the request of the New York *Tribune*, in 1870, by Mr. S. W. Fay, of Perry, Wendell, Fay & Co., commission merchants in New York, Boston, and Philadelphia. Since then there has been a steady decline in the prices of these goods under protective duties; but even in 1870, at the end of ten years of protection, prices were substantially as low in currency as they were in gold in 1860, while the wages of labor were much higher.

STANDARD WOOLENS.	Prices in gold, 1860.	Prices in currency, 1870.
Ravine mixed, all-wool doeskins, 12 to 13 ounces.....	.80 to .85	.80 to .85
Munson satinets (standard article).....	.50 to .55	.50 to .55
Staffordville satinets.....	.60 to .65	.60 to .65
Printed satinets.....	.25 to .62½	.25 to .62½
10.4 Holland blankets, 4¼ pounds.....	\$3.25	\$3.00
11.4 Holland blankets, 4½ pounds.....	4.75	6.75
"Talbot" R. scarlet flannel, ¾ (standard).....	.26	.30
"F. & C." twill scarlet flannel, ¾ (standard).....	.34	.45
Richmond Kentucky jeans (standard).....	.26	.32½
Washington Kentucky jeans (standard).....	.27	.34
Palestro Kentucky jeans.....	.14	.14½
St. Lawrence plaids.....	.21 to .22	.23½
Leicester tweeds (standard).....	.62½	.65
Waterloo blanket shawls.....	8.00	7.50
Belvidere 9.4 printed table covers.....	.87½	.92½
Mixed and plain cashmerettes.....	.50 to .55	.52½ to .60
Boys' all-wool checks.....	.55 to .60	.57 to .62
Shaw diagonal all-wool cassimeres, 10 to 11 ounces.....	.80 to .85	.75 to .80
Evans double and twist, 8 ounces, all wool.....	.75	.80
Middlesex sackings.....	\$1.10	\$1.25
Middlesex doeskins.....	1.05	1.15
Middlesex shawls.....	7.00	7.00
Washington sackings.....	1.05	1.15
Glenham sackings.....	1.05	1.10
Glenham repellants.....	1.15	1.20

The manufacture of steel was slowly developed in this country, and it is eminently a child of the protective policy. Prior to 1860 the manufacture of the best quality of American cast steel had

scarcely an existence, and in 1850 there were only five establishments in the country for the manufacture of steel of any kind. In 1861 and subsequent years the duties on steel were largely increased, and to-day the prices of all grades of steel are much lower than they were prior to 1861, and the consumption has at least quadrupled, while the home supply largely exceeds that from abroad. The cheapening effect of domestic competition on the prices of steel is shown by the following illustrations: In April, 1874, a delegation of American agents of English steel manufacturers and of American consumers of English steel appeared before the Committee on Ways and Means of the House of Representatives to urge a reduction of duties. At that time English steel of best quality was selling at Boston at 17 to 18 cents a pound in gold, and American steel of same quality at 15 and 15½ cents currency. Duties were not reduced, but a year afterward they were *increased* ten per cent., and to-day English steel is quoted at Boston at 14 to 14½ cents a pound in gold, and American steel at 14 to 15 cents currency, with actual sales below even these quotations. On the 28th of March last, William Metcalf, a Pittsburgh steel manufacturer, testified as follows before the Committee on Ways and Means: "A peculiar quality of steel is used in New England for the manufacture of all sorts of light articles. This steel is not much thicker than ordinary letter-paper. It was sold at 13, 14, and 16 cents a pound in gold a year and a half ago. Some friends had urged his firm to undertake the manufacture of that article, and they had finally done so, and the result of that competition was that the English makers had reduced the price, until they had got it down to 10¾ cents a pound in currency, at which it is now selling." The duty on steel, which built up the domestic manufacture, has therefore reduced the price of both the English and the American product to the American consumer, who ought to be and doubtless is now satisfied that his true friends are the American steel manufacturers, who, by the cheapness and excellence of their steel, are rapidly crowding their foreign competitors out of our markets.

From the "Report on Iron of the Convention of the Friends of Domestic Industry, held in the city of New York in November, 1831," we make the following extracts, showing the cheapening effects of the protective tariffs of 1824 and 1828 on iron and iron products:

The average price of bar iron in 1828 was \$118½. In that year an addition to the duty on hammered iron was made of \$4.40 per ton, and on rolled of

\$7. In the following year the price fell to \$114 $\frac{1}{2}$, and in 1830 to \$96 $\frac{1}{2}$, showing a decline in two years of \$21 $\frac{1}{2}$ per ton, in the face of the increased duty above mentioned: a decline effected exclusively by domestic competition, inasmuch as no corresponding diminution of price took place abroad, and the fall here was greatest in those markets which are inaccessible to foreign iron.

In the years 1818, 1819, and 1820 bar iron in Pittsburgh sold at from \$190 to \$200 per ton; now the price is \$100 per ton. In the same year boiler iron was \$350 per ton; now at \$140 per ton. Sheet iron was but little made in those years, and sold for \$18 per cwt.; now made in abundance, and sold at \$8 $\frac{1}{2}$ per cwt. Hoop iron, under the same circumstances, was then \$250, and is now \$120. Axes were then \$24 per dozen, and are now \$12. Scythes are now 50 per cent. lower than they were then—as are spades and shovels. Iron hoes were in those years \$9 per dozen; now a very superior article of *steel* hoes at \$4 to \$4 $\frac{1}{2}$. Socket-shovels are made at \$4 $\frac{1}{2}$ by the same individual who, a few years ago, sold them at \$12 per dozen. English vises then sold for 20 to 22 $\frac{1}{2}$ cents per lb.; now a superior article is sold at 10 to 10 $\frac{1}{2}$ cents. Braziers' rods in 1824 were imported, and cost 14 cents per lb., or \$313.60 per ton; now supplied to any amount, of $\frac{1}{4}$ to $\frac{3}{8}$ diameter, at \$130 per ton. Steam-engines have fallen in price, since 1823, one-half, and they have one-half more work on them. The engine at the Union Rolling Mill, Pittsburgh, in 1819, cost \$11,000: a much superior one, of 130-horse power, for Sligo Mill, cost in 1826 \$3,000.

"Old Sable" bar iron in the years 1818, 1826, and 1830, when the tariffs of 1816, 1824, and 1828 were in full operation, was sold in Boston as follows: In 1818 the duty was \$9 per ton, and the price, including the duty, \$104. In 1826, duty, \$18; price, including duty, \$100. In 1830, duty, \$22.40; price, including duty, \$96. In 1849, while British manufacturers were engaged in breaking down our markets, under the tariff of 1846, British iron sold for \$40 a ton, driving out of the market a better quality of American iron at \$50; but in subsequent years, when the American iron industry was almost in ruins, British iron rose to \$80 a ton.

The following memorial to Congress, signed by more than ninety officers and managers of leading railroads in all parts of the country, was presented in 1870:

Immediately before the construction of the first steel-rail manufactory in this country, foreign makers charged \$150 per ton (equal then to \$225 currency) for steel rails. As American works were built, foreign skilled labor introduced, home labor instructed, and domestic irons, clays, ganister, and spiegel (after many and expensive trials) found to produce excellent rails, the price of the foreign article was gradually lowered, until it now stands at less than \$79 per ton in gold, or \$96.38 currency. Now that several millions

of dollars have been expended in machinery, furnaces, and experiments in perfecting the process of manufacture in this country, and numbers of our own citizens are dependent upon it for support, the business is threatened with annihilation by the pressure of English and Prussian makers. We, as users of steel rails, and transporters of the food and material for American manufacturers and their numerous employés and skilled laborers, do not desire to be dependent exclusively upon the foreign supply, and therefore join in asking that, instead of the present *ad valorem* duty, a specific duty of two cents per pound be placed upon this article.

The duty was fixed at \$28 per ton, gold, and to-day Bessemer steel rails of best quality can be bought at American mills at \$60 currency. Domestic competition, induced by protective duties, has given to American railways cheaper steel rails than English manufacturers, without this competition, would ever have given them. For more than a year foreign steel rails have almost ceased to come into this country, yet in that time American rails have fallen in price \$20 a ton, solely as the result of home competition.

The manufacture of cut nails is an American invention, originating near the beginning of the present century. When it was first undertaken in this country, wrought nails, which then cost 25 cents a pound, were largely imported; hence the necessity for protection to the new industry. By the tariff act of 1824 the duty on all nails was made 5 cents per pound, at which it remained until 1833, since which year it has been reduced. Prices of cut nails have ranged as follows during the past fifty years: In 1828 the price was 7 to 8 cents per pound; in 1829 it fell to 6 and 7 cents; in 1830 to 5 and 6 cents; in 1833 to 4 and 6 cents; from 1835 to 1840 the price was from 5 to 7 cents, falling in 1840 to 5 and 6 cents; in 1842 the price fell to 3 and 4½ cents; in 1844 and 1846 it was 4 and 5 cents; in 1855 it again fell to 3 cents; in 1861 it was 3 cents. Like all other products, the price advanced during the era of war prices, but before the panic of 1873 it had again fallen to 3 cents, and on the 1st of January, 1876, the price was 2½ cents. It will be noted that, in 1830, six years after the duty was made 5 cents per pound, the price was the same as the duty; that, in 1833, the price fell below the duty; that, in 1842, it was 2 cents per pound below the duty; and that, on the 1st of last January, it was just one-half the duty of 1824, and about one-fourth the price charged for cut nails when that duty was imposed. Political economists who receive their inspiration from our industrial adversaries sometimes allege that the duty is always added to the price. The history of the manufacture of cut nails is an illustration of the fallacy of their theory.

Protection and home competition brought down the price of cut nails far below the duty, and drove out of our markets the English wrought nails with which they had for many years to compete, and which in 1828 cost from 10 to 17 cents a pound. For a long time we have exported nails to foreign countries, the value of the exports of nails and spikes in the fiscal year 1875 amounting to half a million of dollars. In 1849 a distinguished iron manufacturer in New York wrote of a shipment of American nails that "it consisted of a few casks, shipped by an American provision house, as an experiment, for coopering pork barrels in Liverpool, and it is absurd to suppose that such a trade will ever be worth a second thought." He has lived to learn that for once he was mistaken.

The history of a celebrated American manufactory of saws presents a striking example of the cheapening effects of protective duties. Prior to the Revolution, and for many years after its close, saws were not made here. All our saws came from abroad, and we paid for them just what foreigners were pleased to charge us. In 1840 an American mechanic, Henry Disston, commenced the manufacture of saws in Philadelphia in a small way. At that time English saws, with the name of the maker marked upon them, sold in our markets at prices ranging from \$15.75 to \$19 a dozen. Mr. Disston was obliged to sell his saws for less money, as his goods were unknown, while the English saws had a reputation; but after the Disston saw became known and its reputation was established the English saws were gradually driven out of our markets and prices were still further reduced to consumers. In 1876 Henry Disston & Sons are sending saws to *England*, warranted equal to the best saws made in that country, and selling them at \$10.50 a dozen, fully fifty per cent. less than the price Englishmen charged us in 1840. When Mr. Disston commenced business, inferior saws of foreign manufacture were sold in this country at \$4.50 a dozen, and he could not make saws for less than \$7 a dozen, but now Henry Disston & Sons ship common saws to South America at \$4.50. The exports of their goods in 1875 amounted to fully \$100,000. But for protection, Henry Disston and his sons never would have been in a position to compete successfully in this country with foreign makers of saws; they never would have been able to find a market in other lands in one year for \$100,000 worth of their products; this country never would have had as cheap saws as are now supplied to it; and all the benefits resulting from the employment

of the labor of the country in the manufacture of saws never would have had an existence. The Messrs. Disston make their own steel.

Before axes were made in this country, except by country blacksmiths, English axes cost our farmers and others from \$2 to \$4 each. By the tariff of 1828 a protective duty of 35 per cent. was levied upon imported axes. Under this protection the Collins Company, of Hartford, introduced labor-saving machinery, much of which was invented, patented, and constructed by themselves. In 1836 foreign and home-made axes were selling side by side, in the American market, at \$15 to \$16 per dozen, at which time foreign producers withdrew their competition, abandoning the entire market to American manufacturers. Then home rivalry and improved methods continued the decline in prices. Axes were selling, in 1838, at \$13 to \$15.25 per dozen; in 1840, at \$13 to \$14; in 1843, at \$11 to \$12; in 1845, at \$10.50 to \$11; in 1849, at \$8 to \$10. In 1876 the price of the best American axes in the market is \$9.50 per dozen in currency, and the country exports large quantities to foreign markets. English writers admit the superior excellence of American axes. The Collins Company makes its own steel, and a letter from the company now before us claims that it is "*better* than any English steel we can buy, and we have been steel consumers for fifty years. We now only make for our own consumption, and we have no disposition to cheat ourselves."

All staple articles of hardware and cutlery are cheaper and better now than formerly—cheaper, because of home competition; better, because of improved materials and improved methods of manufacture, also the result of home competition. A list of the wholesale prices at New York of fifty-seven leading articles of hardware and cutlery, prepared for us by Mr. David Williams, publisher of *The Iron Age*, shows that more than half of them are cheaper in currency in 1876 than in gold in 1860, and that, with two exceptions, the remainder are as cheap now as in 1860. If protection is a tax upon consumers, it is not perceptible in Mr. Williams's figures. Protection did much before 1860 to cheapen and improve our hardware and cutlery, and these beneficial results have since been continued under higher duties. For a long time we have exported these articles largely, even to England.

Horace Greeley quotes the following incident to show that the imposition in 1842 of higher duties on hardware than had previously been levied compelled the foreign manufacturer to lower

his price to the domestic consumer, the foreigner paying the increased duties for the privilege of securing access to our markets.

Mr. Edward C. Delavan, in a letter to *The Northern Light* of December, 1842, quoted the circular and price-list of a British hardware house in this city, intent on retaining its customers in this country in spite of the enhanced duties on their goods levied by the tariff of that year. This circular and price-list were addressed (October 26) to Messrs. Erastus Corning & Co., Albany (among others), and gave in parallel columns the prices they charged respectively before and after our protective tariff was passed: the reductions being nicely graduated to meet the increased duties,—an invoice of twenty articles, which cost £143 16s. under our old revenue tariff being put at £131 10s. under our new protective tariff; making the cost here, after paying the enhanced duty, a little less than it was under the old tariff.

We are authoritatively informed that American crockery manufacturers have already so cheapened their processes, under the stimulus of home competition, that they have not only driven English goods of the lowest grades entirely out of the market, but they have almost entirely shut out the next grade from importation, and they are successfully competing at Trenton and elsewhere with the best English manufacturers for the American demand for white stoneware, both in price and quality. The manufacture of porcelain has also been successfully established in the United States. Since its establishment, the price of porcelain door-knobs at the factory has fallen from \$12 to \$3 per thousand, and the American article is now crowding Great Britain's product out of her colonial markets, where she has had a monopoly of the supply.

In 1860, under the revenue tariff of 1857, when the duty on salt was 15 per cent., two and a half bushels of wheat were required to purchase a barrel of salt at Milwaukee; but in 1873, *before* the panic, under the present protective tariff, when salt paid a duty of 24 cents per hundred pounds, Western farmers could purchase a barrel of salt with one and a half bushels of wheat. The prices were as follows: 1860—wheat, 80 cents; salt, \$1.90; 1873—wheat, \$1.20; salt, \$1.90. A protective tariff had so increased the demand for the farmer's products that his wheat had advanced in price one-half, but it had not advanced the price of salt. In its issue of August 7, 1875, the *Chicago Tribune* quoted Saginaw, Onondaga, and Canada salt, fine, at \$1.40 per barrel, with the lowest cash price of No. 1 spring wheat at \$1.34 per bushel. One bushel of wheat could then buy almost a barrel of salt.

Lava gas-tips, made in Germany, sold in the American market a

few years ago at from \$6 to \$12 a gross. The substance of which lava gas-tips are made was then discovered in this country, and their manufacture was commenced in Massachusetts. German manufacturers at once reduced their price to \$2 a gross. But for home competition, encouraged by protection, would they ever have done this? The price to-day of both foreign and American gas-tips remains at \$2.

Prior to the passage of the tariff of 1842, starch was either free or subject to a low duty, and most of the starch used in the country was imported. In 1842 a duty of two cents a pound was imposed, and it is related by Horace Greeley that at once a leading house in New York "resumed its long-suspended manufacture of starch, called in its scattered workmen, made a good article, and put it on the market half a cent per pound *below* the price previously ruling." Thereafter this country made its own starch.

Protection not only tends to lower the prices of manufactured goods, but it tends also to increase the market value of agricultural products and the wages of labor. The following statement, illustrating the opposite effects upon prices and wages of the tariff of 1857 and the present protective tariff, was contributed to *The Inter-Ocean* of Chicago in 1874 by a woolen manufacturer in Indiana.

But to show you just how cheap you are buying woolen goods (cotton goods will make nearly the same showing), I will give a table of prices in 1860 and 1874, simply for a contrast: Choice tub wool, well washed, sold in 1860 for 25 cents per lb. Average highest wages paid for hands in 1860, \$1.50 per day. Price for 9-oz. jeans, wholesale, in 1860, 60 cents per yard. Tub wool, poorly washed, in 1874, sold for 50 cents per lb. Average highest wages paid in 1874, \$3.00 per day. Price of 9-oz. jeans, wholesale, in 1874, 50 cents per yard.

Before manufactures were fairly established in this country, supplying a home demand for agricultural products and surplus agricultural labor, and furnishing manufactured goods at low prices, the condition of American farmers and of all other laborers was one of great hardship and many privations. The following bit of personal history in the life of A. H. Wrenn, of Mount Gilead, Ohio, shows some of the results which followed a general dependence on foreign workshops less than fifty years ago, in a section of the country where domestic manufactures had not been established.

In 1829 my father's family emigrated from Alexandria, Virginia, and settled near Salem, Columbiana county, Ohio. A large portion of the

inhabitants were thrifty, hospitable Quakers. Let us take a view of the prices of articles in those days. The farmer would sell, when he could, wheat at 31 cents; corn and rye, 15 to 20 cents; potatoes and oats, 10 cents per bushel; apples and peaches he would give away; eggs, 3 cents per dozen; butter, 5 cents per pound; pork and beef, 2 cents per pound; hay, \$3 to \$4 per ton; cows, \$8 to \$10; oxen, per yoke, \$30 to \$50; good horses, \$30 to \$50; sheep averaged about \$1; wool, 20 to 25 cents per pound. The above were the usual prices for several years, except when the scarcity of some article caused higher prices. Farm and other laboring hands \$7 to \$10 per month and board; in harvest a little higher. The writer cut many an acre of wheat at 25 cents; cut and split rails at 40 cents per hundred; cut wood at 20 to 25 cents per cord. If any of us youngsters happened to be qualified to teach school in the little log-cabins, and put in our full time, we thought we were doing well to get \$12 per month; mechanics of different kinds got 50 cents to \$1 per day. We had generally to be on hand before sunrise. Money was a very scarce article those days.

Let us look at what we had to pay for articles bought from the merchants. Tea, and that not the best, \$2 to \$2.50 per pound. The writer once took three bushels of wheat and traded it for a half-pound of not very good tea. Coffee, 35 to 50 cents; pepper and spice, 60 cents; satinets, at all suitable for a decent suit of clothes, from \$2 to \$3 per yard; and those that could afford the luxury of broadcloth paid from \$5 to \$8 per yard for none of the best; salt, \$5 per barrel, shirting, 25 to 40 cents; calico, 30 to 45 cents; all dress goods in the same ratio.

The following is an extract from a speech delivered at Great Falls, New Hampshire, February 21, 1872, by Henry Wilson, afterwards Vice-President of the United States.

The first month I worked after I was twenty-one years of age, I went into the woods, drove team, cut mill-logs, wood, rose in the morning before daylight and worked hard till after dark at night, and I received for it the magnificent sum of six dollars. Each of those dollars looked as large to me as the moon looked to-night.

On the farm on which I served an apprenticeship I have seen the best men who ever put scythe in grass working for from fifty cents to four shillings a day in the longest days of summer. Yesterday I visited that farm. I asked the men who were there what they paid men in haying-time last summer, and they said from two dollars to two and a half a day. This was paid on the same ground where men worked forty years ago for from fifty cents to four shillings, and took their pay in farm products, not money. I have seen some of the brightest women go into the farm-houses and work for from fifty cents to four shillings a week, milking the cows, making butter and cheese, washing, spinning, and weaving—doing all kinds of hard work. I was told yesterday that many young women were earning in the shops a dollar a day, and that those who worked in houses were getting from two dollars and a half a week to three dollars and a half.

We are aware that it is claimed by the advocates of the policy of British trade domination that low prices in protective periods are not produced by protection—that they are due to other causes. It is to be remarked that this plea is made by the very same persons who constantly insist that prices are always *increased* under protection—that the duty is always added to the price, and that the consumer pays the duty. The two theories are not harmonious, but conflicting, and may be permitted to destroy each other. If prices are uniformly cheapened under protection, there must be a cause for it, and if that cause is not protection, who has shown that it is anything else? If prices are *not* cheapened under that policy, but increased, then the prices of Collins's axes, Disston's saws, cut nails, and Bessemer rails should have advanced after protection had encouraged the investment of capital which made their manufacture possible. But did they? Did the purchaser of cut nails at three cents a pound pay a duty of five cents a pound in addition to a fair price for the nails? Does the purchaser of American steel rails at \$60 a ton pay a higher price for them than when the English rail-maker had entire control of our market? The duty on steel rails is now \$28 a ton, equal to \$32 currency. If this duty were wholly repealed, is it within the bounds of probability that English rail-makers would supply our railroads with steel rails at \$28 a ton in currency? The duty on silks averages fifty per cent. of their foreign value. Instead of the price of silk goods having been increased by the amount of the duty, it is a fact that they never were so cheap in this country as they are to-day, and that their use was never so general as now.

It is a fair method of estimating the value of any policy to consider the probable effect of its abandonment, or, still better, the conditions which preceded its adoption. During the second war with Great Britain the price of steel rose to 75 cents a pound, because we were helplessly dependent on other nations for our supply. Remove the duty on English stoneware to-day, and the domestic article would be driven out of the market, with an ultimate increase in the price of imported ware certain to follow. If we had never encouraged our iron industry, could the whole country have had as cheap iron for the building of its railroads, its iron ships, its iron bridges, its thousand other purposes as it now has? If the duty were to be removed from the linseed oil of Russia and India, how long would the flax industry of the West endure? The fate of the flax-fibre manufacturers in Iowa and other Western States, a few years ago,

is an answer to our question. The duty was taken off jute butts, a competing product, in 1872, and of ninety mills in the West for manufacturing tow every one stopped.

Home competition with foreign manufacturers is always a cheapening agency, although this competition may not always be the result of protection. England has had a monopoly, until recently, of our borax trade, and the price has ruled at 35 cents a pound, but as soon as it was found that borax could be produced in Nevada, the English monopolists put down the price to 15 cents.

We have cited the manufacture of cut nails and Mr. Greeley's illustration of the foreign hardware manufacturer as conspicuous examples of the fallacy of the theory that the duty is added to the price. We will be pardoned for citing a further example. In a speech in the House of Representatives, on the 4th of March, 1828, Mr. Mallary, of Vermont, in alluding to the duty of nine cents a pound which was then levied on cheese, remarked that the average price of cheese in the market was not over 7 cents, and added that, if the duty of nine cents was a tax on the consumer, he was, "in equity and good conscience, entitled to two cents for every pound he ate."

There is just at hand, from the other side of the Atlantic, further proof of the fallacy of the theory that the price is enhanced the amount of the duty. At a meeting of the Manchester Chamber of Commerce, held about the 1st of February, 1876, "the recent and rapid growth of the cotton manufacture of India" was considered, and the Indian tax of five per cent. on British cottons was severely condemned. We quote from the proceedings as published in the *London Times*. "Mr. J. A. Bremner also supported the resolution, and especially commended the action of the chamber with respect to the cotton import duties. He said that the £750,000 raised by means of these duties in India *fell upon 80,000 employers and work people in Lancashire, its average incidence being at the rate of £10 per head.*"

If the duty is always added to the price, and if the consumer pays the duty, why is it that the *foreign manufacturer* is always so solicitous to have the duty removed?

Protective duties have never permanently increased the cost of any commodity to the American consumer, and seldom have they increased it for even a brief time. Their usual effect is to so stimulate competition and the improvement of processes of manufacture that prices fall to a lower point than prevails when foreigners exclusively supply our markets.

If protective duties increase prices, as alleged, then revenue duties or no duties at all should reduce them; but when has the withdrawal of protection from a struggling industry ever benefited the consumer by permanently giving him lower prices? The protective tariffs of 1824 and 1828 gradually reduced the price of English bar iron in New York from \$120 a ton in 1825 to \$75 in 1833. In the latter year the compromise tariff was enacted, which provided for a gradual reduction of duties, and in 1836 and 1837 the price rose to \$105; in 1838 it was \$97.50; in 1839, \$95; in 1840, \$82.50. In 1842 protective duties were restored, and in that year and the two following years the highest price of English bar iron in New York was \$65. In 1845, after the election of a low-tariff Congress and President, the price rose to \$85, and stood at \$80 when the tariff of 1846 was enacted. In 1847 it was \$77.50. In 1848 and 1849 a desperate effort was made to break down our iron manufactures, by reducing prices, and when this purpose was in great part accomplished the price again rose to \$75 and \$80 in 1853 and 1854.

It is clearly the tendency of protection to decrease prices, and of the denial of protection to increase them, as has been shown. But if protection did not affect prices either way, exercising no influence upon them whatever, it is certainly true of it that it fosters the development of the national resources, and thus provides employment for our own people. It supplies a market for the skilled labor of our countrymen and a market for the farmer's produce. It gives the home market to the home producer, preferring to foster his industry rather than that of the foreign producer. In accomplishing these patriotic and manly purposes, protection largely adds to the national wealth and increases the prosperity of all classes and their ability to buy at any price.

THE INFLUENCE OF PROTECTION ON AMERICAN EXPORTS.

A signal benefit which the American people have derived from the protective policy is the increase in the exports of agricultural products and manufactured goods. Precisely the opposite tendency is ascribed to protection by its opponents. The facts are accessible: what are the facts?

First, of our exports in general. We present below a table which we have compiled from the *Monthly Report* for April, 1875, of the Bureau of Statistics of the Treasury Department, showing the total results of our export trade during each of the twenty-six years

which ended with June 30, 1874. The first thirteen years, from 1849 to 1861, were under a partial free-trade policy (the low tariffs of 1846 and 1857), and the last thirteen years, from 1862 to 1874, were under the present protective policy, which dates from 1861. The figures for 1861, 1862, 1863, 1864, and 1865 are exclusive of the exports from Southern ports. In this table all shipments of specie are excluded.

General Domestic Exports in Twenty-six Years.

LOW DUTY PERIOD.				PROTECTIVE PERIOD.			
Fiscal Years	Raw or Crude Products.	Partially Manufactured.	Manufactured.	Fiscal Years	Raw or Crude Products.	Partially Manufactured.	Manufactured.
1849..	\$85,853,726	\$28,106,978	\$17,749,377	1862..	\$75,456,352	\$67,664,631	\$38,903,885
1850..	90,607,712	21,668,384	22,624,137	1863..	99,249,116	88,276,256	62,366,064
1851..	128,408,208	22,524,815	27,687,115	1864..	75,463,144	85,176,267	58,922,226
1852..	106,980,864	21,977,876	25,972,407	1865..	81,601,107	91,649,548	85,883,408
1853..	130,672,592	28,833,385	30,343,185	1866..	337,572,897	77,644,663	52,823,343
1854..	128,452,625	48,216,776	37,315,835	1867..	252,959,905	67,416,036	63,225,175
1855..	117,884,310	35,165,696	39,701,129	1868..	226,686,087	80,229,222	63,649,429
1856..	171,523,494	53,551,701	41,362,856	1869..	222,615,504	87,414,017	61,015,628
1857..	186,265,094	49,052,887	43,588,732	1870..	305,371,539	87,372,543	62,264,259
1858..	169,967,814	39,108,683	42,274,536	1871..	301,048,092	103,548,993	73,518,207
1859..	197,099,732	34,708,626	46,583,722	1872..	283,941,261	124,099,942	68,380,275
1860..	224,413,148	39,901,791	51,927,484	1873..	340,495,286	151,084,296	83,647,435
1861..	104,722,026	50,542,437	49,635,153	1874..	384,547,951	158,656,238	90,135,179
Tot'ls	\$1,842,851,345	\$473,380,035	\$476,765,668	Tot'ls	\$2,987,208,241	\$1,270,214,652	\$864,734,513
Ann'l av.	\$141,757,796	\$36,413,849	\$36,674,282	Ann'l av.	\$229,785,249	\$97,708,819	\$66,518,039

The total exports for the first period were \$2,792,997,048, and for the second period, \$5,122,157,406, showing an increase in exports of nearly 85 per cent. in the second period over the first. The increase in population in the second period did not probably exceed 35 per cent. It was just 22.6 per cent. in the decade 1860-70. We have thus an increase in our exports, after making due allowance for increase in population, of nearly 50 per cent. in the second period over the first. The great waste of productive power and the serious interruption to commerce, caused by the war in the second period, may fairly be regarded as a sufficient offset to the fact that the exports in the second period are stated in currency values, except from the Pacific coast, which are in gold values. Protection, therefore, has increased our exports since 1861, notwithstanding the disturbing influences of a great war, and despite the high prices for labor and all materials and products which that war created.

Coming now to our agricultural exports, included in the foregoing table, we find, by reference to elaborate tables, prepared by Mr.

David H. Mason from the Commerce and Navigation Reports of the National government, that they have been greater under the present protective policy than under the previous policy of partial free trade. Without entering into needless details, we compile from Mr. Mason's tables a statement of the exports of three leading agricultural staples, wheat, wheat flour, and Indian corn, in thirteen years under partial free trade and in thirteen years under protection.

Agricultural Exports in Twenty-six Years.

LOW DUTY PERIOD.				PROTECTIVE PERIOD.			
Fiscal Years	Bushels Wheat.	Barrels Flour.	Bushels Corn.	Fiscal Years	Bushels Wheat.	Barrels Flour.	Bushels Corn.
1849.	1,527,534	2,108,013	13,257,369	1862.	37,289,572	4,882,033	18,904,898
1850.	698,661	1,385,445	6,595,092	1863.	36,169,414	4,390,055	16,119,476
1851.	1,026,725	2,202,335	3,425,811	1864.	23,681,712	3,557,347	4,696,684
1852.	2,694,540	2,799,339	2,627,075	1865.	9,937,152	2,604,542	2,812,726
1853.	3,890,141	2,920,918	2,274,969	1866.	5,579,103	2,185,050	13,516,651
1854.	8,036,665	4,022,386	7,768,816	1867.	6,146,411	1,300,106	14,889,823
1855.	798,884	1,204,540	7,807,585	1868.	15,940,899	2,076,423	11,147,490
1856.	8,154,877	3,510,626	10,292,280	1869.	17,657,836	2,471,873	7,047,197
1857.	14,570,331	3,712,053	7,505,318	1870.	36,584,115	3,463,333	1,392,115
1858.	8,926,196	3,512,169	4,766,145	1871.	34,304,906	3,655,841	9,826,309
1859.	3,002,016	2,431,824	1,719,998	1872.	26,423,080	2,514,535	34,491,650
1860.	4,155,153	2,611,596	3,314,155	1873.	39,204,285	2,562,086	38,541,930
1861.	31,238,057	4,825,756	10,678,244	1874.	71,039,928	4,694,094	34,434,606
Tot'ls	88,629,780	36,745,003	82,033,737	Tot'ls	359,849,413	39,713,318	207,221,555
Ann'l av.	6,817,676	2,826,539	6,310,287	Ann'l av.	27,680,724	3,054,871	15,940,120

After making due allowance for the increase in population, we find by the above figures that the increased exportation of these agricultural staples in the thirteen years ending with 1874 is most marked and suggestive. Cavil can only be silent when such incontrovertible facts are presented. If protection produces such results as these, American farmers assuredly have no reason to desire the substitution for it of a less friendly policy. We would not ignore the fact that the farmer's home market is always his best market: but, as he annually relies upon foreign markets to take a portion of his surplus crops, he should know that protection opposes no obstacles to his wishes. It should be remembered, too, that the wheat and corn and other farm products which are sold at home or shipped abroad have cost the farmer less labor in their production and transportation during the last fifteen years of protection than in preceding years, for he has had the use of improved machinery and of a wide-reaching railway system, both of which have been largely created by the protective policy. Protection stimulates labor-saving inventions, and, by building up manufactures and developing the

resources of the country, it encourages the construction of railways, and cheapens the cost of railway material, and consequently of railway transportation. Not only is less labor required to produce and market a given crop in late years than was formerly required, but the money cost of producing and marketing that crop is reduced by the use of improved machinery and by the extension of railway facilities, so that the ability of the American farmer to compete in foreign markets with foreign farmers is greatly increased. And this is the real secret of the increased exportation of American breadstuffs and provisions in late years.

It is frequently alleged that foreign countries will not buy our agricultural products if we do not buy their manufactured goods. But this is a serious mistake, as has been amply demonstrated by experience. To illustrate: In the fiscal year 1872 we imported iron and steel and manufactures thereof aggregating \$55,540,188 in value, and we exported 26,423,080 bushels of wheat, valued at \$38,915,060, or \$1.47 per bushel. In the fiscal year 1874 we imported iron and steel and manufactures thereof aggregating \$33,793,546 in value, and we exported 71,039,928 bushels of wheat, valued at \$101,421,459, or \$1.42 per bushel. In 1872 the value of our imports of iron and steel was almost seventeen millions of dollars in excess of the value of our exports of wheat; whereas, in 1874 the value of our exports of wheat more than trebled the value of our imports of iron and steel. The reader will see at a glance that our agricultural exports do not depend at all upon our willingness to take foreign manufactures in exchange for them. Foreign countries will buy our breadstuffs and provisions because they must have them or because they are cheap. When the harvest is good in England, for instance, our exports of food products to that country will always decrease; when the harvest is poor, will England, in her extremity, higggle about the quantity of iron and steel we are willing to take from her? She never has done this.

As already stated, our exports were seriously interrupted by the war. Manufactured goods formed no exception to this rule. Our cotton trade was literally almost destroyed, and we are only beginning to recover it. In the fiscal year 1860 our exports of cotton manufactures reached a total of \$10,934,796. In 1864 they had fallen to \$1,456,901. In 1872 the exports were \$2,304,330; in 1873, \$2,947,528; in 1874, \$3,095,840; in 1875, \$4,990,695. In the fiscal year ended June 30, 1876, they far exceeded in value the shipments of the preceding year. Similarly gratifying results are shown in the

growth of our export iron trade, which, if we except the extraordinary demand for fire-arms during the Franco-German war, has more than doubled within the past six years. In the year which ended December 31, 1875, our exports of iron and steel and their manufactures *exceeded* our imports of these commodities, the exact figures being: exports, \$20,417,635; imports, \$15,273,315. Our exports of leather and its manufactures have increased from a total of \$673,331 in 1870 to \$7,324,796 in 1875. By reference to our table of general exports it will be seen that the exports of partially-manufactured and manufactured products in the period beginning with the war greatly exceeded, severally as well as collectively, the exports of like products in the corresponding period before the war. The total exports in the second period were \$2,134,949,165, against \$950,145,703 in the first period, an increase of 125 per cent., the increase in population having been, as already shown, not more than 35 per cent. Protection, therefore, has increased, and is still increasing, our exports of manufactured products. It has steadily tended to diminish the cost of these products to home consumers, and the policy that does this must necessarily encourage foreign consumers to buy also in our markets. In saying this, however, we do not claim for the American people the possession of the ability to export *all* of the products of their manufacturing skill and enterprise. Various influences, to be mentioned hereafter, will indefinitely postpone the creation of so comprehensive an export trade as England and some other countries, under precisely opposite conditions, have long enjoyed.

Any inquiry into the influence of protection in stimulating American exports would not be complete which should omit to mention the *character* of our exports of manufactured commodities. Nor can this character be clearly set forth in a few sentences. To say that certain American manufactured products have been excellent in quality and cheap in price, else they could not have found purchasers abroad, would but poorly specify their merits. The whole truth can only be stated by declaring that they have won their way in foreign countries by virtue of their *superior* adaptability to the purposes for which they were designed. If they had not been *better* than similar products made elsewhere, they could not have been sold in competition with them; but many of them have been both cheaper and better. A few illustrations will show that the superiority of many of our wares and fabrics is entitled to more prominence than it has generally received.

In 1838 the Baldwin Locomotive Works, of Philadelphia, exported three engines, their first shipment to a foreign country, and up to February 1, 1876, they had exported in all 389 engines, valued at \$5,005,964. The increase in the number of engines annually sent abroad by this celebrated manufactory has been quite marked since 1869, when twelve foreign engines were built, followed in 1870 by fifteen, in 1871 by nineteen, in 1872 by forty-five, and in 1873 by ninety-six. The reaction in the construction of railroads in all countries commenced in the year last named, and in 1874 the number of engines built upon foreign orders fell to fifty-eight, and in 1875 to eighteen. An increase in foreign orders for delivery in 1876 has, however, occurred, amounting up to May 1st to forty engines. Of these, fifteen were shipped in January last. Of the twenty-five yet to be shipped, one very fine first-class freight engine, named after the oldest son of the Emperor of Brazil, is on exhibition at Machinery Hall, in the International Exhibition. This is the export record of one manufactory of American locomotives: other establishments have also in late years shipped railway engines to foreign countries. The value of the total exports of locomotives in the last five calendar years is as follows: 1871, \$820,943; 1872, \$774,296; 1873, \$1,109,482; 1874, \$1,145,669; 1875, \$761,718. A majority of the locomotives in use on Canadian railways were made in this country. American locomotives are in general use on most South American railways, and on the Continent of Europe, especially in Russia, they are in high favor. The secret of the popularity abroad of these locomotives consists in the superior style of their construction, and the effect of this superiority is seen in their ability to do a greater amount of work than foreign locomotives. Mr. Fairlie, an eminent English engineer, recently remarked: "You may take your best English locomotive with its maximum train, and the American will go before it; drawing it and its train, and one-half more besides." The London *Engineer* declared a few years ago that "the locomotive-engines used in the United States cost less money and do more work than English locomotives."

A notable proof of the headway we are gaining in the exportation of finished products is furnished by recent shipments of iron bridges to the Dominion of Canada by the Phoenixville Bridge Works of Pennsylvania, of which Clarke, Reeves & Co. are proprietors. This firm has sold eight or ten bridges to the Great Western Railway of Canada during the past year, and within a recent period it has sold from thirty to forty bridges to the Grand

Trunk Railway of Canada; one bridge to a county in Canada, to be erected over the Thames river; seventeen spans to the Inter-colonial Railway of Canada, recently completed, each span measuring 210 feet in length; and nine spans to the Montreal and Ottawa Railway, varying from 50 to 200 feet in length. These bridges were sold upon British territory, in fair competition with British makers of iron bridges, and they were paid for mainly with British money, and in one instance by the Dominion government itself. Why were Clarke, Reeves & Co. enabled to make these sales? Because they could make a better bridge than their English rivals, and sell it for less money than these rivals could sell an inferior bridge. The same firm has also sold many bridges to South America during the past few years. Its total shipments to all foreign countries in the Western Hemisphere in 1873, 1874, and 1875 aggregated six thousand tons. We are without statistics from other American bridge companies, but are informed that two of them, the Baltimore of Baltimore, and the Keystone of Pittsburgh, have sent many iron bridges out of the country.

It is a well-known fact that European railway cars do not compare favorably with those of American manufacture in elegance, lightness, or durability. It is, therefore, not surprising that the exportation of passenger and freight cars should have become a prominent feature of our export trade. In the fiscal year 1874 we shipped to foreign countries 1,083 cars, valued at \$1,151,898. In the fiscal year 1875 we shipped 394 cars, valued at \$510,861, and in the succeeding six months, which ended with December 31, 1875, we shipped 283 cars, valued at \$323,220. These cars were sent to Mexico, South America, England, Germany, Canada, Australia, the West Indies, Turkey, and other countries. The Pullman palace car amazes Europeans by its completeness and elegance. Our street passenger cars are largely exported, and furnish the model for many of the street cars constructed in Europe. Street railways are themselves an American invention.

Our agricultural implements have long distanced all competition in foreign markets, and our exports thereof are steadily on the increase. In the calendar year 1871 they amounted to \$1,020,820; in 1872 to \$1,765,078; in 1873 to \$2,513,982; in 1874 to \$3,146,493; and in 1875 to \$2,440,802. We send them to all countries, but most largely to Germany and to England. The London *Colliery Guardian* for May 25, 1875, admitted the superiority of American agricultural implements in the following emphatic manner:

It happens that we are in the thick of the agricultural implement season, and there is now pushing itself into notoriety a mowing-machine which possesses merits unexampled even by previous American mowers, and which upon difficult ground *altogether distances the great majority of English mowers*. All this is known in the iron and steel districts. It likewise comes about, unhappily, that it is not alone in mowers that certain United States implement makers are just now sending into this country *tools worthy of great praise*, and which must, for the most prosaic of all reasons, win for themselves an advanced position in the road to fame, in which *they are destined to pass the goods of some English houses*. We confess to something like discomfort, because we have recently seen ordinary hay-forks and digging-forks of American make exhibited side by side with best British products of the same class in the show-rooms and shops of some of the most extensive implement warehousemen in the kingdom, and because we have heard from one of them that he had ordered direct from the Transatlantic factory one hundred dozen in a single line. "Why should I not?" he inquired; "the American article is better than the best of the same class made in England by thirty-five per cent. It is fifteen per cent. cheaper, and it is twenty per cent. superior in quality." A thorough examination, even to the breaking of one of the forks, has satisfied us as to the accuracy of the last part of this startling statement, and the comparative prices of the English and the American houses confirmed the former part. The steel of which the forks were produced was of a higher quality than the metal put into the English forks, and *the whole finish of the American product greatly surpassed that of the English*. We have no doubt but that the recent troubles of the United States manufacturers have made them willing to sell their goods at as low a figure as is at all compatible with a profit; but that can not account for the whole fifteen per cent. difference; nor will it account for the greater difference in quality. In respect of the United States our implement makers have to look about them. Not only are their own goods shut out of that market by a prohibitive duty, but our own free-trade policy and the manufacturing skill of the Americans have combined to make Transatlantic products severely and increasingly competitive with our own in the show-rooms of middlemen who sell within a few miles of our home factories.

American platform and other scales are exported in large quantities to foreign countries; so are American fire-engines, stationary engines, carriages, and stoves. American sewing-machines are known and used in every civilized country. During the past five years the annual value of our exports of sewing-machines has averaged two millions of dollars. American fire-arms are so superior in style and general excellence that they find a market in every country. All the leading European countries are large purchasers of them. During the fiscal year 1875 England purchased American muskets, pistols, rifles, and sporting-guns amounting in value to \$2,419,513. Our total exports of these articles in the last

four calendar years (since the close of the Franco-Prussian war, during which the demand was extraordinary) has been as follows: 1872, \$1,165,424; 1873, \$1,548,227; 1874, \$3,613,430; 1875, \$5,184,576.

American hardware and cutlery have been introduced into all markets, and with remarkable success. Even England, our principal competitor in the manufacture of these products, has been forced to acknowledge the superior excellence of many of our tools and "Yankee notions." We quote a few extracts from English journals which show how frankly this superiority is admitted. *Rylands' Iron Trade Circular*, printed at Birmingham, remarked as follows in July, 1875:

If the Americans make such tools as our workmen prefer, by all means let them make them and send them to us. We can not always compel a man to use a clumsy article, when he can have a handy one at the same price. We have personally examined these tools, and we have no hesitation in saying that they are much superior, by combining lightness with strength; and no doubt a laboring man could, by using these tools, do a far larger amount of work in a given time than he would by using the old-fashioned one that our manufacturers have so long persisted in forcing upon the market. We have now and then brought these American tools under the notice of some of our best and oldest makers; but every time we do this we are met with the assertion that they are so full of orders for their regular patterns that they have neither time nor inclination to produce others. They are ready to admit the superior excellence of what the American makers produce, but there the matter ends.

The London *Ironmonger*, an accepted exponent of the English hardware trade, published the following early in the year 1875:

The Ironmonger has, from time to time, drawn attention to the success with which hardwares manufactured in the United States have competed with some of the British firms in certain foreign markets hitherto supplied almost exclusively from this side, at the same time that United States products have been finding their way into our own country. The reports to hand from the different hardware districts still show that there is little or no revival in the demand for iron and hardware products required in Canada. Thither it is well known the United States manufacturers continue to send the goods they make at rates much under those wanted by the English manufacturers. But this is not all. Some of the manufactured goods sent across the lakes into the Dominion are said to be more handy than the English patterns. Some time ago we reported that the United States iron and hardware manufacturers were pushing their advantage in Australia and in New Zealand. In those markets, likewise, American enterprise is still disagreeably apparent. The

worst of it is that not a few of the American goods are declared, as to quality, to surpass our own. As to the Antipodean markets, all that we have here said is borne out by a communication which has been received by a firm of Birmingham merchants from their agent in Melbourne. He writes as follows: "You will notice our indent runs more on American ironmongery than formerly. Their goods are far superior to English-made, and latterly they have been much cheaper. There is no comparison in the profits they pay us, and they give universal satisfaction. Smallwares, locks, tools, etc., indeed, all sorts of American-made goods are now being sold in the market; and when once used, seen, or sold, the user or buyer will never again look at English-made articles of the same class."

The same paper also published in 1875 an interesting account of an incident which occurred at Nottingham on May 10th. The Right Hon. Mr. Gladstone, late Prime Minister of Great Britain, like the lamented Horace Greeley, is celebrated as an expert in the handling of an axe, and on the occasion referred to he cut down in the presence of a large company a huge tree which "cumbered the ground." This was done with an American axe, selected for the purpose in preference to an English axe. The company present apparently knew not which to admire the most, the dexterity of Mr. Gladstone or the excellence of the axe. We read that Mr. Gladstone was presented on the spot with a "beautiful specimen of the American felling-axe." Upon all of which *The Ironmonger* moralizes as follows:

Last month, in our article upon "Trade at Home and Abroad," we remarked upon the excellence of certain of the edge-tools of the United States. When we wrote that we had personal knowledge of merchants' warehouses in our own country in which such products of the United States are shown—shown, moreover, within sound of the anvils on which good English axes are forged, and almost within sound of the whirl of the stones upon which they are ground. Further, we knew then, as we know now, that English hardware merchants have received from first-class foreign customers instructions to fellow at English factories best felling-axes produced in the States; but that an effort to do this was altogether unsuccessful. The American product is nowhere doing us so much mischief as at the Antipodes, where, because of its thoroughly trustworthy character, a tool that may be bought at perhaps from 6s. to 7s. in New York realizes in barter from 18s. to 20s. It is no joke for an emigrant upon going into the bush to stake his all upon the edge of an axe; he is therefore ready to pay a good price for a tool upon which he may implicitly rely. Such a tool his experience has satisfied him is supplied from the States, and such a tool his experience equally satisfies him is not always forthcoming—indeed, weight for weight is seldom forthcoming—from British edge-tool factories.

The British Trade Journal, published at London, contained an article in its issue for April 1, 1876, on the British edge-tool trade, in which it was admitted that "the United States is an indifferent market for edge-tools, protection having enabled her manufacturers to compete only too successfully with our own. Some articles, such as hay-forks, for instance, the Americans send into our own market, where they already sell to an appreciable extent." The *London Times* published the following dispatch from Birmingham, June 7, 1875:

Business in the hardware trades continues fairly steady, notwithstanding the shock of recent heavy failures and the severity of foreign competition. The latter appears to be increasing under the favor of the high prices ruling in this country, and the conditions of production abroad are in many cases so much more favorable than here that foreign manufacturers are able to *under-sell us even in the home market*. From the United States large quantities of mowing-machines and other implements, nuts, bolts, etc., are being sold here at prices *considerably under* those of corresponding goods of English make, and even Spain is now successfully competing with Staffordshire hinge-makers in their own district. Belgium is importing here railway spikes, iron-foundry, dog-chains, etc., and excellent Prussian wire is offered at from 10 to 20 per cent. under Staffordshire and Lancashire prices.

The same paper published the following paragraph late in the summer of 1875:

Our Wolverhampton correspondent writes last night: "English edge-tool makers are fully aware of the success with which certain of their business rivals in America have supplanted them in many of our home and foreign markets. So large, however, is the demand at present for good edge-tools of almost every description that there are few edge-tool firms in the United Kingdom who have not plenty of orders upon their books. The English article is not, therefore, out of use, but there is a perceptible increase in the favor in which handy and thoroughly excellent tools are held, both at home and abroad; and this is being encouraged by the growing facilities for manipulating steel, both shear and cast. Sensible of this, certain American firms are pushing their opportunity, and American forks, shovels, and axes are to be had wherever edge-tools are offered in this country."

The *London Engineer* for May 26, 1876, published the following:

English shippers of iron and steel goods hear from their foreign agents of the growing activity of American competitors in markets which we once thought were all our own. The most recent intelligence on this point which we have received is, that the United States manufacturers, not content with ousting British makers of edge-tools, and similar products of steel and iron, almost wholly from the Antipodean markets, are now getting a footing at the

Cape, and are quite as successful in our own West Indian possessions. Salesmen write that the goods are preferred to those from England, and that the terms of sale offered by American manufacturers make dealings in American goods a source of greater profit than the dealings in the products of British houses. At the preference here and there shown for the products of England's competitors, English manufacturers do not express great astonishment. By the wider use of machinery, Transatlantic manufacturers are able to attain a uniformity and a finish seldom noticeable in the same class of goods produced almost solely by hand in England. . . . We are in a position to state that there are employers who are now going out to the States seeking machinery in use there, with a view of setting it up in this country.

We have made some progress in exporting tinware, the quantity exported in the fiscal year 1875 aggregating \$60,964 in value, of which England, from which country we receive our supply of tin, took \$1,589. A Birmingham correspondent of the London *Engineer* made the following statement about a year ago :

In the tinplate department of the industry of this district competition has sprung up from an unexpected quarter. For a long time past one of the best customers of the British maker for tin and terne plates has been the United States of America. At one time we were sending to that country great consignments of tinplate goods in varied shapes and of different values; lately the Americans have learned themselves to use up the tinplates, and now we have them shipping tinplate wares to this country, made from the tinplates which we have supplied them. The United States manufacturer displays an amount of ingenuity in invention which is but seldom seen in England, and the handicraftsmen in the New World, unlike these of the Old, are ready to adapt themselves to a new pattern as soon as it can be shown that it is at all probable to be a success. The American tinplate goods that are now being offered in Birmingham and South Staffordshire are described as simply marvelous both as to the price of the articles and the ingenuity displayed in their construction. Surely there is something very wrong in this country when the Americans, after buying our tinplates and paying heavier wages for the manufacture of the article, are able to offer it here at prices much under those at which we can produce it.

All these extracts are in strange contrast with the following argument against our protective policy which formed part of an article in the London *Times* just fifteen years ago, when the Morrill tariff bill was under discussion :

The duties imposed by this bill are not only immoderately high, but they are levied upon imports of the first necessity. . . . It has now become perfectly known that protection in these matters is only another name for suicide; and when a state establishes a prohibitory tariff it is itself the

sufferer from its own ordinances. If the backwoodsmen of America are to be deprived of *good axes*, and settlers of cheap clothing, the penalty will be paid by them. . . . If the people of the United States should refuse to purchase in our markets what it is for their own interest to buy, and if they should decide upon manufacturing for themselves the articles which we could send them at a less price and of a better quality, they, and they only, will be the losers.

And they are also in strange and even ludicrous contrast with the following complaint from the same *Times* of April 13, 1876, forming part of an article which piteously beseeches the United States to reduce its present tariff for the benefit of English traders. Speaking of that tariff, it says:

Its first aspect is one most unfavorable to an English trader, who sees himself debarred from a large and profitable market. And no doubt that aspect is often dwelt upon by our cotton, woolen, and iron manufacturers in these stagnant times. But even to us this tariff has its consolations, for so long as it exists we may be well sure that the United States will *never do us any harm* in any of the other markets of the world that are more free to us. There has been a talk of United States cotton goods competing with our own in Manchester, but while this tariff exists serious competition there, or anywhere else, is an impossibility. The United States will never supply the rest of the world steadily and widely with *anything except raw produce* under such a fiscal system, and by-and-by the country may find themselves seriously impeded even in that. For the main result of a blind exclusion such as this tariff reveals is to raise the cost of everything in the country that maintains the tariff; food, clothing, every article of manufacture becomes gradually very dear, and so weighs on the producing powers of native industries as to *shut them out from the rest of the world* as effectually as foreigners are excluded from home.

The *Times* is not consistent with itself. Its statements of fact prove its mere theories to be deceptive and fallacious. Whistling to keep one's courage up while going through the woods is a boy's act which the *Times* but imitates when, in the presence of a thousand evidences of American ability to compete with British trade in foreign markets, and even in British markets, it refuses to believe the evidence of its own senses and affects to be brave while not concealing its alarm.

And yet the inconsistencies of the *Times* may be excused when we may not excuse the lack of patriotic faith and insight in Professor Francis Wayland, a free-trade teacher of our own country, who said in his *Political Economy*, edition of 1842, page 140, that "we pay a heavy duty on cutlery in this country, while *not a thousandth part* of the cutlery used is made here. It would be vastly cheaper to pay

a bounty sufficient to raise all the cutlery made in this country to its present prices, and it would be, for aught I see, as good for the cutler." Nor may we excuse the remark of similar tenor by Mr. Edward Atkinson of Boston, who explained the creed of free trade before a committee of Congress in 1872 in the following words: "Other nations buy their goods of England; and we may as well do it too, and not enrich a set of monopolists and a few men who live at the expense of others. It were better for us to pension off every man now engaged in the manufacture of steel in this country than to impose the duties we now do on that article." To-day Dr. Wayland's "cutler" supplies the world with superior American products made from American steel, and Mr. Atkinson's "monopolists" supply this cutler and others with the best of steel at lower prices than England ever charged them.

In preceding references the list of American manufactured exports has not been exhausted. Cut nails and spikes, the Westinghouse air-brake, chilled car-wheels, twist drills, wood-working and various other labor-saving machines, wooden ware in endless variety, clocks and watches, pumps and hydraulic machinery, steam excavating machines, Hoe's printing-presses, cabinet organs, and manufactures of India-rubber are products of American ingenuity which are now regularly exported, and many similar products might be added and still the list would not be exhausted.

Encouraging as is the present condition of our exports of manufactures, this branch of our foreign commerce is susceptible of much greater enlargement; and now that all the conditions of its growth are so favorable, it is fairly to be presumed that further progress will not be delayed. We need to imitate more vigorously than we have yet done the example of our foreign rivals in seeking foreign purchasers. The Belgian iron and steel manufacturers have just sent their agents into the various South American States to solicit their trade. We need to become better *merchants* than we are; to go from home more and rely upon the home market less. Is there any good reason, for instance, why we should not sell our cut nails to all the world? If the late severe shock to our general prosperity should compel our manufacturers and merchants to go abroad for customers whose favors they have not heretofore sought, and if, through a continuance of the protective policy, we can obtain more complete possession of the home markets than we now have, the country will soon retrieve its losses, and our industrial future will be rendered more secure.

HOW PROTECTION TENDS TO INCREASE OUR EXPORTS OF MANUFACTURED GOODS.

The first effect of protection is to give diversified employment to our people at good wages, and thus the first essential condition necessary to the production of manufactured goods, either for home or foreign consumption, is secured. Being thus employed, the influence of the common school and of republican institutions produces intelligent workmen; the prospect of some day becoming employers of others produces ambitious workmen; and all these influences combined afford a constant incentive to achieve the best possible mechanical results. The American mechanic is always striving how to *better* his condition: the European mechanic, denied the compensation and the opportunities of his Transatlantic brother, is always considering how he can *keep* his position. He makes but little effort to improve his mechanical methods. If we now add the spirit of competition between employers which protection always excites, and which high wages always compel, we have all the elements necessary to foster the naturally inventive genius of our people, from which come labor-saving machinery, improvements in old methods, novel designs, a simplification of means to ends, and excellence of finish. Labor-saving machinery cheapens the cost of production and usually improves the character of the product: joined to the other mechanical accomplishments mentioned, both cheapness and excellence are certainly secured. Possession of the home market is the first result of these achievements, and afterwards the foreign market is entered in competition with the products of mere hand labor and antiquated machinery—this hand labor and antiquated machinery being direct consequences of low wages and a low state of society. Thus do many of our manufactured products find a market abroad. The *London Times* a few years ago comprehensively stated in the following words the philosophy of the increase in this class of American exports:

The Americans succeed in supplanting us by novelty of construction and excellency of make. *They do not attempt to undersell us in the mere matter of price.* Our goods may still be the cheapest, but they are no longer the best, and in the country where an axe, for instance, is an indispensable instrument, *the best article is the cheapest, whatever it may cost.* Settlers and emigrants soon find this out, and they have found it out to the prejudice of Birmingham trade.

Our progress in manufactures and in the exportation of their products has been greatly promoted, too, by our admirable patent

system: no nation protects its inventors as ours does. Our patent laws are part of our protective system: we do not have free trade in patents. But without protection to home industry the inventive genius of our countrymen would never have been developed as it has been. We have before us the annual report of the Commissioner of Patents for 1875, in which we find that the whole number of patents issued since the inauguration of the present protective policy in 1861, fifteen years ago, is more than five times as large as the whole number issued during the preceding fifteen years, which were years of partial free trade. The exact figures are as follows: from 1846 to 1860, inclusive, 29,168; from 1861 to 1875, inclusive, 155,191. The highest number reached in any year prior to 1861 was 4,819; whereas, there were nine years after 1861 during which the number issued each year exceeded 12,000.

In 1873 Mr. J. P. Harriss-Gastrell, one of the secretaries of the British Legation at Washington, presented to Parliament by authority a report of more than five hundred printed pages concerning the cotton, woolen, and other textile industries of the United States. In this report, which is a model of courtesy, fairness, and patient research, the author makes the following remarks, which are *apropos* to this branch of our subject:

I can not close this report without recording the fact that, in every important branch of industry referred to in the course of the previous pages, the American manufacturers seem to be ever gaining on their competitors of the Old World, by availing themselves to the utmost of every advantage of improved process or labor-saving machinery which American or other invention may offer. There can be little doubt that the celerity with which all such advantages are thought out, and then introduced into general use, is *owing to the constant pressure of high rates of wages*, and the comparatively certain protection of capital invested in inventions.

Neither can I close it without observing how favorably the great industries of the United States would probably compare with the best organized of the competing industries of Europe. The past history and present development of the textile industries is an earnest of a prolific future. Whether or not a reduced cost of living shall ever be attained, one can not doubt that, under sound conditions of production, American industry will not only supply its home market in most articles, but *will also become a formidable competitor in foreign markets in many articles.*

Another reason why protection tends to increase our exports of manufactured products is found in the superior development of our every-day life, resulting from many causes, but largely from the possession of material comforts. This development is inconsistent

with the toleration of clumsy, inefficient, or dishonest fabrics, and hence it is a characteristic feature of American manufactured products that they are skillfully, tastefully, and honestly made. The American wants the *best* of everything; the European is content with old styles, coarse materials, and often with mere cheapness without regard to quality. The American mechanic, alike with the American merchant and professional man, will not wear wooden shoes or coarse brogans, because he can afford good leather shoes; he will not wear corduroy pantaloons or check shirts, because he can afford to wear pantaloons made of good woollen cloth and white muslin or linen shirts; he will not wear a coat made of shoddy, or use a tool that will not "carry an edge" or perform its work well. He is *above* all these expedients and inventions of a lower industrial plane than that upon which he moves. He will not use these things, and he does not make them. American manufactured products sent abroad are therefore all that they are represented to be, and they are represented to be the best that can be made. The people of China and Japan, South America, and other countries have been so often deceived by British manufacturers, who have studied cheapness rather than excellence, especially in manufacturing for foreign markets, that American goods have grown in their favor because they are honestly made and are of superior quality.

That we do not do injustice to our British rivals in making this statement, we present below a few brief extracts from English authorities concerning the integrity and quality of some leading English staples. Under the title of "commercial morality," the *London Iron* for October 16, 1875, published the following:

In preaching before the late meeting of the Social Science Congress, the Vicar of Brighton enlarged on the increasing deterioration of English trading morality, quoting trenchant passages from Cowper and Tennyson on the subject. At the same time he appeared to be not over-confident of the effect of his homily, for it is to be observed that he only pleaded for a moderate degree of respect for the concise command in the Decalogue, contenting himself with asking for a more perfect honesty in trade, and the upholding of a more recognized standard of commercial righteousness. Mr. Ruskin, more outspoken, in his *Fors Clavigera* for the current month, protests that he lives in the midst of a nation of thieves and murderers, that "everybody around him is trying to rob everybody else, and that not bravely and strongly, but in the most cowardly and loathsome ways of lying trade," and that Englishman is now merely another word for blackleg and swindler.

Mr. Ruskin's judgment may have been too severe, but we recall

the fact that Mr. Carlyle expressed similar views in a letter to Sir J. Whitworth, in January, 1874.

Shoddy and mungo—the former the product of woollen rags of inferior quality, and the latter the product of woollen rags of finer quality—are both of English origin. They have been made in English factories for more than half a century, and it is a matter of record that Mr. Ferrand, a member of Parliament, repeatedly complained in the House of Commons that the cloth which the Yorkshire manufacturers sold to be converted into cheap clothing for the laboring classes “after a few weeks’ wear fell into holes and devil’s dust.”

The adulteration of cotton goods with clay and flour sizing, so as to add to their weight, has long been practiced in England. The *Weekly Dispatch*, said to be the oldest of the London weekly journals, commented on this subject as follows not long ago:

For a long time now it has been the custom to load our (the British) gray and bleached cotton goods with clay and paste. This adulteration or “finishing” has been practiced so extensively that *even the best Manchester long cloths will throw out a cloud of fine white dust if beaten sharply*. An apparently stout piece of long cloth will, under these circumstances, partially turn into mud on its first immersion in the washtub, and the thin, flimsy remnant wears out in an incredibly short time. Of course, this is not the sort of “shoddy” Americans cross the Atlantic to purchase, particularly as in their home factories good and honest material is now produced. Let us trust that our Manchester manufacturers will take timely warning, sacrifice a portion of their profits, produce genuine articles, redeem the reputation of their wares, and thus, by maintaining the prosperity of Lancashire commerce, save England from a national calamity.

The London *Iron* for October 30, 1875, contained the following:

At the late meeting of the Trades’ Union Congress it was resolved to appeal to Parliament for protection to the factory operatives against the deleterious effects produced by weaving unduly-sized cotton yarns; the adulteration of Manchester goods with paste and clay has for some time shut a large portion of the East against them; and by-and-by, perhaps, the cotton lords may think it worth while to test the truth of the axiom that honesty is the best policy by trying both ways as the Scotchman did, and giving honesty a turn.

Late in the year 1875 shipments of American cotton print cloths and calicoes were made to Manchester, and the goods thus sent were sold at a small profit. Other shipments have since been made. These goods found a market in England solely because of their superior quality. We do not entertain the opinion that England

will ever take many of our cotton fabrics, but these shipments are significant of the low stage of commercial morality which has been reached at Manchester. The London *Daily News* thus announced the beginning of the trade in American cotton goods:

Manchester is importing calicoes and long cloths of American manufacture. For some time past it has been known that American ladies traveling in Europe uniformly send to their own country for supplies, for the reason that they found the American fabrics much better in quality and appearance than the European manufacture. The first shipment that has ever been made in the ordinary course of business has just reached this country.

But England has paid a stronger tribute to the excellence of our cotton fabrics than by merely importing them. It has counterfeited the trade-marks of our cotton manufacturers, affixing them to its own inferior goods destined for the markets of India and China. A correspondent of the New York *Evening Post*, writing from Manchester, England, June 1, 1875, and signing himself "An American Merchant," makes the subjoined important statement on the subject:

Goods shipped from this market have been taking the place of the American products, and not only is the imitation cloth called the "American drill" well known and largely dealt in, but it has been ascertained that favorite American stamps and brands have often been affixed to English goods, with the intention of deceiving the buyer in Bombay, Calcutta, or Shanghai.

But besides the brands having been dishonestly copied, these goods have been dishonestly made! Little by little the quantity of sizing used has been increased, until the proportion has become no less than 30, 35, and even more than 40 per cent. of the weight of the piece. Hence the frequent complaints of mildew on the voyage to the East, and the denunciations of "size" by underwriters and chambers of commerce, until shippers and manufacturers have been compelled to be more cautious.

Meantime large quantities of goods thus dishonestly made have been shipped to foreign ports, and their true character having been discovered, the goods remain on hand unsold. In certain markets, it is well known by the trade, large quantities of these wretched fabrics are stored up to-day, which can not be sold except at heavy loss, in some instances can not be sold at all; the buyers will not touch them. What the buyers want is value for their money; cotton, not size. Disgusted with these imitation fabrics, they are asking again for the American goods.

Rev. Dr. Newman, a distinguished American divine of Washington City, while in England a year or two ago went to Manchester and saw drillings intended for China being stamped with an American trade-mark.

The quality of the iron which Great Britain furnishes to the rest of the world, either in manufactured or unmanufactured form, is properly a subject of reference in this connection, when the causes which have led to an increase in our export trade are under consideration. As still further illustrative, therefore, of the proposition that the decline of British commercial morality is contributing to the growth of American exports, we reproduce below from English sources of information evidence conclusively showing that British iron is sometimes as dishonestly made as Manchester cottons. In 1873 the *London Iron*, in describing the means employed to reduce the cost of British iron ships, remarked as follows:

Plates through which a foot clad in a stout boot might be kicked with ease were considered good enough to stand between man and eternity. Metal so rotten that it broke in pieces when carelessly dropped on a hard surface was employed in the construction of vessels destined to be manned by Englishmen—by husbands and fathers. All considerations but the single one of economy were sacrificed by the unscrupulous few to whom the lives of their fellow-men weighed but little against a heavy balance at their bankers. This fertile cause of disaster was doubly dangerous on account of its treachery. Ships fulfilled the requirements of surveyors, and were classed according to their outward appearance, while their real rottenness remained concealed. Hence a dire catalogue of catastrophes, one of which, at least, has secured a dark page in history.

In the same year Mr. Rundle delivered an address before the British Institution of Naval Architects, in which he said:

If I am informed rightly, the iron at present used for shipbuilding is really getting by degrees worse and worse. Why it is I do not know, and it would not be fair, perhaps, to ask a shipbuilder any question on that subject, because it is one which he is only interested in in a secondary manner. It has been my fortune for many years to see not only new ships which have been built, but wrecked vessels, and I have seen some wrecked iron vessels that you would fancy were built of glass instead of iron—they were broken in that manner that they more resembled plates of glass than plates of iron.

The address of Mr. Rundle led to a discussion, during which Mr. Luke said:

I quite understand what Mr. Rundle means by glass plates. I have seen plates which, if you let them fall, would break like glass. Inferior iron plates, when fractured, star like bad and brittle armor plates when fired at. With reference to the quality of iron, it can be made now quite as good as it was formerly. We are getting iron at the Admiralty as good as ever it was made, and perhaps better. Iron can be made now for merchant ships just as good as it was when the *Richard Cobden* was built, if the price is paid for it. It is

simply a question of price. There is so much competition now in the mercantile shipping world that a *shipbuilder can scarcely live if he is obliged to put in the iron which he knows, in his own conscience, should be put into a ship.* The ship-owner goes to the cheapest market, and then depends upon the insurance. If the ship is lost the insurance will pay him for it.

Fortunately for humanity, but too late to save the credit of British builders of iron ships, Mr. Samuel Plimsoll, a member of the British Parliament, has succeeded, after years of earnest effort, in securing the passage of a law which makes it more difficult than heretofore to send to sea ships made of rotten iron. American iron ships now ply regularly between English and American ports, and plow the Pacific Ocean in search of the trade of Asia, but no journalist or naval architect or legislator has ever had occasion to arraign their builders for using poor iron in their construction. No American-built iron vessel has ever been lost at sea. The excellent workmanship exhibited in our magnificent iron vessels, contrasted with the bad reputation established for British vessels, must result ere long in giving to our shipbuilders many orders for foreign countries.

The London *Engineer* for January 31, 1868, admitted that the bad character of the Belgian and English rails had concurred with the protective policy of Russia in excluding them from that country. "For the exclusion of the foreign rails," says the *Engineer*, "they have a very valid cause, viz., the very bad quality of the rails supplied of late years, not only by the Belgian, but also by the English makers. Some of the rails supplied by the best-known makers in Wales have been the veriest rubbish marketable. The price may be blamed, £7 2s. 6d. per ton, delivered in Cronstadt; but still it is no credit to our English name, and has led to a general cry: 'No more English rails.'"

In *Rylands' Iron Trade Circular*, published at Birmingham, England, we find, under date of August 7, 1875, the following statement concerning the quality of English iron rails sent to an important English colony. The few rails which our own country has sent to Canada, Cuba, and South America have given satisfaction to their purchasers, but see how England deals with her confiding colonists!

We regret to observe that the complaints from colonial and other markets as to the quality of English-made goods are on the increase. Hitherto they have been confined virtually to Manchester fabrics and cotton textiles, but they appear to be extending now, at all events in Australia, to English iron. The following summary of a discussion of the Sydney Legislative Assembly,

as reported in the *Sydney Morning Herald* of the 27th May, will show the opinion entertained there of a great deal of the railway iron shipped from this country to New South Wales. Mr. Hoskins animadverted upon the very bad quality of railway iron which, in large quantity, had been imported to this colony. It had been a loss to the colony of a very large sum of money. Mr. W. Forster regretted that so important a subject as that now touched upon by the honorable member for the Tumut should be introduced on a motion for an adjournment. There unfortunately could be no doubt whatever that a large quantity of inferior railway iron had been imported on the order for government, but it did not at all follow that the agent-general had been to blame. . . . Mr. Parkes desired honorable members to bear in mind that the late government were in no respect to blame for the inferior quality of iron which had been sent out. That government had sent home proper specifications as to the railway iron required, which had not been duly attended to. Mr. Macintosh thought that the government would do well to send for such iron as should be required under some more satisfactory and stringent arrangements. . . . Mr. Davies considered that the time had fully come when something should be done as regarded the office of agent-general of the colony. The sending of this bad railway iron would cost the country hundreds of thousands of pounds; and the iron was found to be so bad that, even when we went to the expense of straightening it, it could not possibly be made to last more than two years. Mr. Buchanan censured the want of care which had deputed a man to pass iron that was now shown to be utterly worthless. . . . Mr. Meyer considered that the railway iron required for the colony should be obtained under the condition that it should be subjected to specific tests when it arrived here. It could then be tested and fully paid for only when it was found to be in accordance with specifications.

The cumulative influences which have contributed to the increase in our export trade in manufactured products are, therefore: (1) diversified employment, which only protection gives; (2) high wages, common schools, and republican institutions, which produce intelligent, hopeful, and ambitious workmen; (3) competition between employers; (4) labor-saving inventions, and ingenious, tasteful, and novel conceptions; (5) an admirable patent system; (6) superior workmanship and honest work, the result of an elevated social, business, and industrial culture—itsself the result of material comforts which high wages always command.

But we can not export *all* of our manufactured products, and we frankly admit that we can not. In all cases where natural resources, mechanical advantages, and common honesty are equal in two countries, that country which pays the lowest wages and possesses the cheapest and most abundant capital will surely distance its competitor in the supply of foreign markets. England,

for instance, either possesses or can cheaply obtain from her immediate neighbors all the materials that are possessed by this country for the manufacture of pig iron, bar iron, and rails of iron and steel: it has greater capital, equal skill, and as good machinery: as a rule its labor is paid much lower wages than are paid to American labor: the cost for freight in bringing the raw materials together or in transporting the finished product to the seaboard is much less than with us: consequently we can not export pig iron, bar iron, and rails to other countries in competition with England and Wales, save under exceptional and circumscribed conditions. Mr. I. Lowthian Bell declared a year ago, in his *American Notes*, that, "with labor on anything like equal terms, it is a physical impossibility that iron can be made more cheaply in the United States than it can in England." And *Rylands' Iron Trade Circular*, of Birmingham, in an article complaining of our tariff, printed April 29, 1876, made the following admissions: "*The American ironmasters are capable enough in producing iron, and that in great quantities, but as labor enters so largely into the cost of production, and every article being so dear in the States, iron can not be made so cheaply there as it can be in the older countries of Europe.* When bars are selling here at what may be called a reasonable price, they can be sent over to New York and sold for less money than the American article. But this is prevented by the present heavy tariff." Other leading American industries, such as our woolen industry, our silk industry, and our pottery industry, bear the same relation to like industries abroad that our iron industry does to that of England. Hence we not only can not export those products in the manufacture of which we possess no advantages over other countries, but patriotism and wise statesmanship require that they be protected from foreign competition in our own markets.

But if we can export certain manufactured products, such as hardware, machinery, leather, etc., in competition with all other countries, why protect *these* articles by high duties? We answer: Why kill the goose that lays the golden egg? If protection has wrought results so beneficial to our country, why abandon it in the case stated? But there is a better reason for maintaining the protective policy without yielding so much of it as a hair's breadth. The assaults of free trade are always concealed and treacherous. If one or two or half a dozen industries be surrendered to its sophistries, even although for the time they could retain their vigor, an attack upon the whole line of protected industries would be cer-

tain to follow. With the Trojan horse once inside the gates, the whole city would be taken. With industries destroyed which could only exist with protection; with closed factories and workshops standing as monuments of national folly; with the country robbed of its general prosperity and the home market largely curtailed, how could those other industries, which protection has benefited the most, long remain prosperous? The home market is the most valuable of all markets, and no industry, be it ever so favored, can afford to lose it. Furthermore: protection for even our most firmly established industries is needed to prevent the possible unloading upon our markets of the surplus products of other countries. England, for instance, manufactures many articles which she sells largely to her colonies and to other non-manufacturing countries at profitable prices; but a surplus of these articles may be left on her hands, which, rather than not sell at all, she can well afford to sell to the people of this country, if permitted, at less than their actual cost. Protection against such competition as this is wise and necessary. No man in business—no workingman at his bench or anvil—should be subjected to the risk of such an assault upon his capital or labor.

THE WAGES OF LABOR IN THE UNITED STATES.

Advocates of a free-trade policy are fond of asserting that high wages in the United States possess no greater purchasing power than low wages do in European countries, and that, therefore, the American workingman is no better off than his European brother. It is even asserted that wages are no higher in the United States than in England. As no proof of the correctness of these assertions is ever presented, it may be assumed that free-traders themselves have sufficiently refuted them when they illogically claim that the only obstacle which now prevents this country from manufacturing its products as cheaply as all Europe is the high rate of wages, which they say ought to be reduced to the European standard!

But we are not disposed thus briefly to dismiss this question. It is one in which American workingmen have a constant interest, and they may thank us for presenting the information which follows.

In Dr. Edward Young's *Labor in Europe and America*, a work of marvelous industry and research, just published by our government, we find elaborate tables, derived from the highest authorities, which show the wages and the cost of living in all countries, and

from these the reader can reach but one conclusion, namely, that the American workingman buys more with his wages and lives better than any other workingman under the sun. From Dr. Young's book we turn to Thomas Brassey's *Work and Wages*, an English book of the highest character, published in 1872, in which we find that this honest Englishman admits the great superiority of the condition of the American workingman, a superiority which he does not hesitate to attribute to protection. We quote a few passages from Mr. Brassey's book.

When the Grand Trunk Railway was being constructed in Canada, Mr. Brassey sent out, at his own expense, a great number of operatives from this country. Men were engaged in Lancashire and Cheshire; and, on landing in Canada, received forty per cent. more for doing the same work than they had been previously earning in England. The cost of the works was about thirty per cent. dearer. The wages of laborers were 3s. 6d. a day at the commencement of the works, and rose to 6s. a day ere they were completed. Masons, whose wages when in England were 5s. a day, and who were taken out to Canada at the expense of the contractors, earned 7s. 6d. a day in the colony; although the cost of living was not greater in Canada than in England; but the supply of their labor in England was abundant, while in Canada skilled artisans were comparatively rare.—*Page 35.*

Canada is not a part of the United States, but wages in that country, especially at the time of which Mr. Brassey speaks, have always been influenced by the rates prevailing in the United States, and for a perfectly obvious reason. We quote further:

In New England there are powerful combinations among the artisans, but none among the agricultural laborers, yet, as compared with the same class in England, the condition of the common laborer is, of all others, the most improved by emigration to America.—*Page 55.*

In a country in which the erroneous policy of protection is still adopted by the government, the price of labor, from the increased demand for it, will advance, as might be expected, in a still more rapid ratio than in a country in which a free-trade policy is adopted. The closing of the home markets in Russia to foreign trade is producing a sensible effect on wages and the cost of living. I quote the following from Mr. Mitchell: "It is fortunate that such an amelioration of the condition of the people is taking place."—*Page 60.*

To the artisan the high rates of wages in the United States present irresistible attractions. It must therefore be assumed that the stream of emigration, which has already attained such vast dimensions, would be increased in volume if a larger number of operatives had accumulated sufficient savings to enable them to pay the expense of removing themselves and their families to the opposite shores of the Atlantic.—*Page 208.*

Mr. Brassey quotes the evidence of Hon. Abram S. Hewitt before the Trades Union Commissioners of Great Britain as follows: "He told them that the wage for puddling in Pittsburgh was from 21s. to 27s. per ton, as compared with 8s. 6d. in England, there being, notwithstanding the great increase in the cost of provisions in the United States, no corresponding difference in the cost of living."

Mr. Brassey admits, on page 201 and elsewhere, that the high wages paid in the United States have had the effect of raising wages in England, and Mr. I. Lowthian Bell does not hesitate to say, in his *American Notes*, that "the great inducements which the American ironmasters held out to emigration from this country have produced a sensible effect upon the cost of labor with us." If wages in this country, as our free-traders allege, do not purchase more of the comforts of life and in every way enable our workingmen to live better than workingmen in European countries do, why should wages in England have been raised as a result of the American example? If English workingmen (claimed to be the best paid in Europe) were so much better rewarded for their labor than American workingmen, how could our low standard of rewards have possessed any attractions for them, or exercised any ameliorating influence upon their condition?

We next open a couple of blue-covered volumes, published by authority of the British government, in which we find strong testimony from British sources of information corroborative of the view that the purchasing power of wages in this country is much greater than in England. These volumes are composed of detailed reports from Her Majesty's diplomatic and consular agents abroad respecting the condition of the industrial classes and the purchasing power of money in foreign countries in the years 1871 and 1872. We will make liberal extracts from these volumes.

Mr. Hemans, the British consul at Buffalo, quotes the evidence of a German immigrant, who thus summed up the advantages which he had obtained by emigration to America.

I am ever so much better off. My earnings in Germany, as a plasterer, would be barely 3s. a day, while here they are from 11s. to 12s. My eldest boy, who is just sixteen, makes his 4s. a day already—more than I could have done myself at home—and pays me something for his board. Even my youngest of thirteen earns 8s. a week, while he learns a trade. In Germany neither of the two would bring home a sixpence. In short, if I were there, I should, with my large family, be little better than a pauper; while here I

have saved enough already to purchase a comfortable cottage, and I have something in the savings bank still.

"It is worth noting," observes Mr. Hemans, "that in this, as in every similar case which has come within my own personal knowledge, the laborer's cottage has been purchased with savings laid by since 1860."

Wages were exceptionally high in England in 1871 and 1872 and in the two subsequent years, but what English writer has boasted that in those years English workingmen were able from their savings to buy themselves homes, as Mr. Hemans testifies the workingmen of Buffalo were able to do?

Mr. Kortright, the British consul at Philadelphia, states the comparative condition of a Philadelphia and a British mechanic by citing the wages of each and the actual cost of living of the two men and their families. He reaches the conclusions which follow:

It would seem, taking as a basis, for example, the living of a carpenter, wife, and three children, that a respectable Philadelphia mechanic, comfortably subsists on £2 13s. 3d. per week, whereas a British mechanic of similar grade would not spend more than £1 11s. 10d. per week, with equal family, showing a difference in favor of the British mechanic of nearly 70 per cent. What, then, is the difference in wages? The Philadelphia mechanic earns £3 6s. 7d. per week; the British mechanic, £1 16s. to £2 2s. per week, thus showing a difference of about 60 per cent. in favor of the wages in Philadelphia. Deducting the cost of living from the wages of each mechanic, it leaves the Philadelphia mechanic better off by 3s. per week than the British. . . . In summing up this question of the relative purchase power of money in the two countries—a most difficult problem to solve with anything like accuracy—it is to be borne in mind that the respectable mechanic in Philadelphia can obtain, as a rule, continuous employment, an advantage he has over his less fortunate British comrade. His normal status is better. He is better housed, better fed, and equally well clothed, at a far greater expense, it is true. Owing to the admirable system of public schools in the State he has every facility for educating his children at the public expense.

Mr. Donohue, the British consul at Baltimore, bears the following testimony:

Farm laborers are generally in demand in most parts of the State, and a young, able-bodied man landing in this State can soon save enough from his wages to enable him to push on to the Western States, where, with steadiness and perseverance, there is no reason why he should not in a very few years materially improve his position. . . . With reference to diet, meat is consumed in much larger quantities by the artisan class in this country than in England. They get better wages, and can afford to consume meat at, at least, two meals a day. . . . This is one of the healthiest cities in the United

States, and a respectable artisan can soon save enough to be in a position to either build a house for himself and family, or to purchase one, paying a certain proportion of the purchase money every year. . . . A respectable artisan coming to the United States and bringing up his family here has every chance, with the excellent free education he can bestow upon his children, of seeing them rise to positions they never would attain in England, and, as a general thing, a steady and sober mechanic will have a better position and more money to spend on comforts than he would have in a like position at home.

Mr. Archibald, the British consul-general at New York, makes a very full and interesting report, from which we quote as follows :

The value of intelligent labor has never been so much appreciated in the United States as during the past twelve years. A completion of railroad facilities linking the new States of the Northwest to the Eastern seaboard ; a rapid development of the agricultural resources of these States by the vast crowd of immigrants brought over in the Transatlantic steamships, which, in return, convey into their holds the cereal and other agricultural products of the labor which they have borne to these shores ; a protective tariff stimulating, for the past ten years, the home industries of the older States ; the social condition and political institutions of the country, promising advantages to the immigrant and to his children, not so fully enjoyed in their native lands, have all combined in presenting inducements to the working classes of Europe, of which they have not been slow to avail themselves, as is shown by the statistics of immigration. . . . There is probably no country in the world which, outside of the immigration port, offers equal advantages to the operative or farm laborer.

In speaking of New York City separately, Mr. Archibald is not impressed with its advantages as a home for immigrant mechanics, but advises them to "go West," where they will fare better. To which we add that no American of intelligence regards New York as a haven of rest for the poor man.

Upon the subject of immigration, Mr. Archibald states that, "deducting the women and children, it is found that about *forty-six per cent.* of the immigrants are either skilled workmen or laborers ; nearly ten per cent. consist of merchants and tradesmen. With regard to age, only twenty-five per cent. [of the whole number of immigrants] are under fifteen years, and less than fifteen per cent. are over forty years ; leaving sixty per cent. who are *in the prime of life.*" These facts show conclusively that the immigrants who come to this country are not generally of a class who could not support themselves at home if there were work for them to do, or if a fair compensation were paid for a fair day's work. They come here

because they know that their labor will bring them more substantial and compensating rewards than in their own country. This truth finds a fresh illustration in a statement made by Mr. Franklin Allen, the secretary of the Silk Association of America, in his annual report, submitted April 26, 1876, as follows :

A marked feature of the increased activity in the silk trade at Paterson during the past year has been the immigration of a number of so-called master silk-weavers from France and England. These men individually own several looms, which in many instances they have brought with them. They carry on the weaving at their homes, one or more rooms being fitted up for this purpose. As business increases, they employ so-called journeymen weavers, who in turn will become master weavers and loom owners, and thus build up a valuable, though independent, auxiliary to the great factories.

Would these men have come here, at a time when the country had not fully recovered from the effects of our great panic, if they could not by so doing have bettered their condition? Another question : Would they have come here if protection had not built up the American silk industry in which they find employment?

An American traveler in Norway records his experience in that interesting country in a paper published in *Scribner's Monthly* for January, 1876, in which he says :

Though with a good soil, plenty of land, rich mines, fisheries, a fair commerce, and a government as free as ours, the Norwegians are pressing towards America. At the present rate of emigration the country bids fair to be almost depopulated in two or three centuries, as there are less than two million inhabitants, and the young men and women do not stay at home. I asked a returned Norwegian farmer, who was to fall heir to ten thousand acres, why he liked America better than home. He said he got more meat, could eat at a separate table, get far better wages, and, in fact, was more of a man in America than at home.

It is sometimes claimed that, while wages in this country have increased since the commencement of the present protective period in 1861, the cost of living has more than kept pace with such increase. A reference to indisputable facts will show the incorrectness of this claim. There exists in that model Commonwealth, Massachusetts, a Bureau of Statistics of Labor, which is authorized and maintained by the State, and which annually collects and publishes a volume of statistical and other information relative to the condition of the people of Massachusetts—their employments, the houses in which they live, the food they eat, the wages they receive and save, etc. The annual reports of this Bureau are of great

value, and have received the highest encomiums for their thoroughness and trustworthiness. The report for February, 1874, is before us, and upon pages 256 and 257 we find tables showing the wages paid in 1861 and 1873 in two representative manufactories in the city of Lawrence, one a cotton mill employing 5,000 persons, and the other a woollen mill employing 1,800 persons; and upon pages 258 and 259 we find tables showing the cost in 1861 and 1873 of groceries, provisions, and articles of clothing purchased by these mill operatives. A summary of the leading facts established by these tables is as follows:

Average percentage of increase in wages by the hour.....	76.9
Average percentage of increase in wages by the week.....	67.6
Average percentage of increase in prices of groceries and provisions.....	43.0
Average percentage of increase in shirtings, sheetings, tickings, prints, satinets, and boots.....	29.1
Average percentage of increase in anthracite coal.....	40.9
Average percentage of increase in men's board.....	66.7
Average percentage of increase in women's board.....	50.0

In the year 1861 the operatives worked sixty-six hours in a week; in 1873 they worked sixty-two and a half hours. These were the results to the operatives, in two large Massachusetts mills, of the advance in wages and cost of living during the fourteen years beginning with 1861 and ending with the year of our great panic. They do not indicate that those operatives were injured by the course of wages and prices in these fourteen years, but exactly the reverse. The experience of workingmen and working women everywhere in our country will bear witness to similar results. During the dozen years immediately preceding the panic more families secured for themselves homes, more mortgages were paid off, more churches were built, more charities were established, and more money was deposited in savings banks than in twice two dozen years of the previous history of the country.

The mention of savings banks suggests the very general practice among American mechanics of depositing a part of their earnings in these institutions. In England but little use is made of savings banks by workingmen. Mr. John Noble, the English economist, in his work on *National Finance*, published in London in 1875, remarks of a large class of his countrymen: "To speak of saving to a man whose wages are insufficient to provide the decencies of life is a mockery." But there exists in England a fearfully-suggestive substitute for savings banks—*burial clubs*, in which the names of

men, women, and children are entered for a small sum weekly or monthly that provision may be made for a decent burial when they die. Too often the life of a person "in the club" is sacrificed, by lack of proper attention or by more criminal means, that the father or mother or some other relative or guardian may obtain the burial allowance, which may greatly exceed the burial expenses. When the person thus helped out of the world is entered in more than one club, the profits on the investment are considerable.

If wages have declined in this country since the panic, so has the cost of living. But wages have not declined so much since 1873 as is often supposed. On the 23d of November, 1875, the Springfield (Mass.) *Republican* published elaborate tables, showing that up to that date the average wages in New England for ten leading classes of labor were still *fifty-two per cent. above* the average wages paid in 1860. The classes mentioned were: Railroad employees, 35 per cent.; cotton, 50; woolen, 65; paper, 55; buttons, 55; cigars, 50; whips, 44; domestics, 65; iron and wood, 64; day labor, 40; average, 52. Perhaps the workmen employed in the manufacture of iron in Pennsylvania have been obliged since the panic to submit to a greater reduction of wages than any other class of workingmen in the country, for the reason that the iron industry was more prostrated than any other industry; and yet even they are receiving much higher wages to-day than they did in 1860. Mr. William E. S. Baker, secretary of the Eastern Ironmasters' Association,—a gentleman of high character and accurate knowledge, has recently published a table showing the average cost per ton of anthracite pig iron from 1860 to 1876, and the average cost per ton of bar iron for the same period. From this table we learn that the cost of furnace labor to the ton of pig iron was \$1.87 in 1860 and \$2.54 in March, 1876; and that the cost of labor to the ton of finished bar iron was \$10.90 in 1860 and \$15.74 in March, 1876.

To show that wages have been better maintained in this country since the panic than in England, where the present business prostration is fully as great as with us, we quote a statement by the English correspondent of the Pittsburgh *American Manufacturer* in his letter dated April 1, 1876, as follows:

It is with much surprise I see by the *Manufacturer* of the 16th of March that, at a meeting of your puddlers held on the 11th, it was resolved still to demand the \$4.75 per ton. Our men are not in their own interest so foolish. . . . The highest-paid district in all England at this moment is South Staffordshire, where the price per ton for puddling to-day is 9s. 6d., which is

1s. 3d. per ton in advance of the North of England; and 9s. 6d., as you will note, is scarcely *half the money* for which your puddlers are going.

The Leicestershire miners, whose wages were advanced a few months back, have now received notice for a 20 per cent. reduction. This will amount to about seven pence per ton on coal getting, which the men allege will make the getting price *lower than in 1871*.

By reference to the English iron-trade journals, we learn that the wages of the South Staffordshire ironworkers were reduced seven and a half per cent. in April. A report of the condition of the Scotch iron trade at the middle of April contains the following significant statement:

There is every probability that the miners' wages will again be reduced all over the West of Scotland. In various parts of Ayrshire notices have been given of a reduction, and the same course has been followed by a number of employers in Lanarkshire. The amount of the proposed reduction is not generally stated, but it is expected to be in some cases 6d. and in others 1s. per day. This will bring the miners' wages down to 3s. 6d. or 4s. a day, and great complaints are being made by the men on account of the proposed reduction, their allegation being that they can hardly manage to live on the wages they have been making for months. It is not anticipated, however, that the miners will consider themselves *in a position to offer any resistance*.

The following extracts are from *London Iron* for June 10, 1876:

After a struggle of five weeks *against a reduction of 25 per cent.*, the Atherton colliers, numbering over 1,000, terminated the strike on Saturday last, having resumed work on Messrs. Fletcher, Burrows and Co.'s terms. . . . A considerable number of the miners in the Dunfermline district are about *emigrating*, and many of them have left for Glasgow and Liverpool, from which ports they are about to sail. Lochgelly, Lumphinnans, Lochore, and the Blair-Adam districts have to some extent been relieved of their surplus hands.

The *London Colliery Guardian* for June 9, 1876, contains some reports concerning the condition of the workmen in South Wales and Monmouthshire, which we quote:

Newport, Thursday, June 8.—Not for many years has Whitsun been such a dreary period to thousands of the workpeople as this year. They have had little or no money to spend, and the result is a serious decline in the business of all classes of tradesmen. So long as the present depression in the iron and coal trades lasts there will be a continuance of this cheerless state of things, and there are no indications so far of an improvement setting in. . . . The Conciliation Board will shortly hold a meeting to determine the basis

of wages for the next six months, and the general impression prevails that further reductions will have to be carried out.

Swansea, Thursday, June 8.—The large and important works of the Landore Iron and Steel Company, which, when in full swing, give employ to between 1,500 and 2,000 hands, are still entirely closed, and the whole locality presents a gloomy and desolate aspect. . . . In addition to this total cessation of operations at one of our principal works, the whole of the tinplate manufactories are this week at a standstill, agreeably to the decision of the Masters' Association to cease working every third week. . . . Hundreds of able and willing hands are standing idle about the corners of streets; others accept the most menial employ for the sake of their wives and families, and not a few accept the parish "labor test," and break stones at some eighteen pence per day.

The protective policy of the United States has always aimed to advance the welfare of its working people. Protection has benefited them because it has diversified their employments, increased the rewards of their labor, cheapened the cost of the necessities of life, stimulated enterprise, developed the national resources, expanded commerce between the States and with other countries, prevented the evil of direct taxation, and elevated the whole tone of our national life. The industrial policy of Great Britain, whether controlled by protective or free-trade influences, has always aimed to advance the interests of her ruling classes, and has never sought the elevation of her working people. It is the glory of the United States that she has not adopted an industrial policy that would degrade all labor, and it is the shame of Great Britain that her labor has been systematically degraded that her aristocracy might prosper.

We dismiss the subject which has been considered in this chapter with the remark that, high as are wages in this country, and abundant and accessible to all as usually are the comforts of life, our people have yet to learn the value of judicious economy in personal expenditures, which is happily a far different matter from that bitter economy which has been forced upon the people of Europe. In the exercise of a proper restraint in household management, in dress, and in the indulgence of all aspirations to live as well as those who have become wealthy, American workingmen must yet find the true secret of continued prosperity and the true remedy for all the evils of financial depression.

HISTORICAL SKETCH OF THE AMERICAN IRON TRADE.

IRONMAKING IN THE SEVENTEENTH CENTURY.

THE manufacture of iron was one of the first industries to receive attention after the English settlements on this continent were commenced. The first permanent English settlement was at Jamestown, Virginia, in 1607, under the auspices of the London Company. Three years later, in 1610, as we learn from *Bishop's History of American Manufactures*, from which we shall frequently quote, Sir Thomas Gates, one of its members, testified in London that in Virginia there were various minerals, especially "iron oare," which had been tested in England and found to produce as good iron as any in the world. In 1619 the company sent to the colony a large number of settlers, including some who were skilled in iron-making, "to set up three iron works." This enterprise appears to have been at once undertaken. The location of the ironworks is stated to have been on Falling creek, a branch of the James river, and not far from Jamestown. Whether there were built three separate "works," or more, or less, history does not inform us. In 1621, three of the master workmen having died, the company sent over Mr. John Berkeley and his son Maurice to take their place, together with twenty other experienced workmen. On the 22d of March, 1622, the whole company of ironworkers, with few exceptions, were cut off by the Indians in a general massacre of the settlers, and the ironworks destroyed. The business of making iron in Virginia thus came to an untimely end, and was not revived in a healthy or notable form for almost a century.

That iron was actually made on Falling creek seems certain. Beverly, in his *History of Virginia*, states that, in 1620, there had been set up "an iron-work at Falling creek, in Jamestown river, where they made proof of good iron ore, and brought the whole work so near a perfection that they writ word to the company in

London that they did not doubt but to finish the work and have plentiful provision of iron for them by the next Easter," that is, early in 1621. In the latter year the Berkeleys undoubtedly did more than "make proof" of the ore, for Beverly, in referring to the massacre in 1622, says: "The iron proved reasonably good," but the fatal visitation came "before they got into the body of the mine." The ore used is described as having been "brown" in color—brown hematite. The date when the first iron was made in Virginia is variously given by different writers, some fixing it in 1619, and others in 1620, 1621, and 1622. As there was no great skill or extensive preparation required to erect the "works," which were of primitive character, there seems to be no good reason to place the date of the important event later than 1620, when the "proof" was made, although the complete fruition of the enterprise may not have been reached until the year of the massacre, 1622.

The next attempt to make iron in the colonies was in the province of Massachusetts Bay. In 1632, after this colony had been established, mention is made by a historian of the time of the existence of iron ore within the limits of New England, and in 1637 the General Court of Massachusetts granted to Abraham Shaw one-half the benefit of any "coles or yron stone w^{ch} shall bee found in any comon ground w^{ch} is in the countrye's disposing." Bog ore had been found at Lynn and elsewhere, and in 1643 specimens of it were taken to London in the hope that a company might be formed for the manufacture of iron. This hope was realized in the formation of the "Company of Undertakers for the Ironworks." Alonzo Lewis, in his *History of Lynn*, which we have examined, says that, in 1643, "Mr. John Winthrop, Jr., came from England with workmen, and stock to the amount of one thousand pounds, for commencing the work. A foundry was erected on the western bank of Saugus river. . . . The village at the foundry was called Hammersmith by some of the workmen who came from a place of that name in England." Lynn is upon the Saugus river, and it embraced Hammersmith. Mr. Lewis further states that, in 1644 and subsequently, the General Court granted special privileges to the company. On November 13, 1644, it was allowed three years "for y^e perfecting of their worke, and furnishing of y^e country with all kinds of barr iron." The citizens were granted liberty to take stock in the enterprise, "if they would complete the finery and forge, as well as the furnace, which is already set up." The company was granted three square miles of land at each of

six places it might occupy in the prosecution of its business. On the 14th of May, 1645, the General Court passed an order, declaring that "the iron worke is very successful, (both in y^e richness of y^e ore and y^e goodness of y^e iron,)" and that between £1,200 and £1,500 had already been disbursed, "with which y^e furnace is built . . . and some tuns of sowe iron cast . . . in readiness for y^e forge." On the 14th of October of the same year the company was granted still further privileges by the General Court, in the form of a charter, on the condition "that the inhabitants of this jurisdiction be furnished with barr iron of all sorts for their use not exceeding twenty pounds p tunne," and that the grants of land already made should be used "for the building and setting up of six forges, or furnaces, and not bloomaryes only." The grant was confirmed to the company of the free use of all materials "for making or moulding any manner of gunnes, potts, and all other cast-iron ware." On the 6th of May, 1646, Mr. Leader, the general agent of the company, purchased "some of the country's gunnes to melt over at the foundery." On August 4, 1648, Governor Winthrop wrote from Boston to his son, who had removed to Pequod, Connecticut, that "the iron-work goeth on with more hope. It yields now about 7 tons per week." On September 30th he writes again: "The furnace runs 8 tons per week, and their bar iron is as good as Spanish." The manufacture of iron at Lynn seems to have prospered for a time. The "foundery" was undoubtedly kept busy casting cannon, cannon-balls, pots, and other hollow-ware. Edward Johnson, a historian of the period, in describing Lynn in 1651, says: "There is also an iron mill in constant use;" and Mr. Lewis states that, prior to 1671, "the iron-works for several years were carried on with vigor, and furnished most of the iron used in the colony." After 1671 they passed under a cloud.

It appears that the "Company of Undertakers for the Ironworks" also "set up" a forge at Braintree, probably in 1648, as Mr. Lewis states that a grant of land appropriated for ironworks "to be set up" at Braintree was surveyed on the 11th of January of that year. The forge was built soon after, and was in operation as late as 1675. Bishop states that the next attempt to manufacture iron in the colony was made at Raynham (now Taunton) in 1652, where a forge was erected by two enterprising brothers named Leonard. Lewis speaks of this enterprise as "Leonards' celebrated iron works." Rev. Dr. Fobes, a historian of Raynham, writing in 1793, says that

the Leonards built "the first forge in America," and that it continued in operation for eighty years. Bishop seems to agree with this statement. He says that previous undertakings "probably embraced nothing more than simple blast furnaces for the production of crude iron, and a variety of coarse castings directly from the fused metal." We think that Lynn also had its forge, and prior to that of Raynham. The colony badly needed bar iron, and it must be remembered that Lynn set out to supply that want, and that Governor Winthrop wrote in 1648 of the Lynn ironworks that "their bar iron is as good as Spanish." Other iron enterprises in Massachusetts followed those of Lynn, Braintree, and Raynham. In 1677 one of these "works" was destroyed by the Indians. About the same year iron was made at Topsfield, near Ipswich, and in 1680 its manufacture was commenced at Boxford. At the close of the century many ironworks had been established in the colony, which for a hundred years after its settlement was the chief seat of the iron manufacture on this continent.

After Massachusetts, the English settlement at New Haven seems to be entitled to the honor of having next made iron in New England. John Winthrop, Jr., who had removed from Lynn to Pequod, (New London,) Connecticut, in 1645, obtained from the Assembly in 1651 a grant of certain privileges to enable him to "adventure" in the manufacture of iron; but he does not seem to have embarked in the business. On the 30th of May, 1655, according to Bishop, it was ordered by the Assembly of New Haven "that if an iron worke goe on within any part of this jurisdiction the persons and estates constantly and onely employed in that worke shall be free from paying rates." In the following year Captain Thomas Clarke appears to have put in operation an "iron worke" at New Haven, and in 1669 he seems to have been still engaged in the same enterprise, for in that year the General Court of Connecticut continued the exemption already noted for another seven years, "for encouragement of the said worke in supplying the country with good iron and well wrought according to art." This seems to have been the only ironworks actually established in Connecticut during the seventeenth century.

Rhode Island made iron soon after its settlement in 1636—certainly at Pawtucket and elsewhere as early as 1675, when the forge at Pawtucket, erected by Joseph Jenks, Jr., was destroyed by the Indians, together with other ironworks and infant enterprises. Many forges and furnaces were erected in this colony in

the seventeenth century, bog ore being used, all or nearly all of them being located on the border of Bristol county, Massachusetts.

We have already mentioned the casting of guns, pots, and other hollow-ware. The bog ore of New England was well adapted to this purpose. Mr. Lewis states that the first article cast in New England was a small iron pot at Lynn, probably in 1644. Joseph Jenks, the founder at the Lynn "iron foundry," who cast the pot, was also a blacksmith, and subsequently, about 1647, engaged at Lynn in the manufacture of improved scythes of his own invention, and other edged tools. Lynn was as famous in its early history for its manufactures of iron as it now is for its manufacture of shoes. Other manufactures of finished iron products at various places throughout New England speedily followed that of scythes at Lynn.

Before proceeding further it is proper that we inquire into the structure and use of the ironworks "set up" at this early period in Virginia and New England.

In the disastrous attempt to make iron on Falling creek, in Virginia, a bloomary fire and forge or a blast furnace may have been used—to make "proof" of the "iron oare": the reader can take his choice of the probabilities, for history appears to be entirely silent on the subject. Concerning the more successful attempt at Lynn, Massachusetts, we have more light. There was unquestionably a furnace at that place as early as 1644. Mr. Lewis, quoting from old records, speaks of a "foundry," but this term was commonly applied a few hundred years ago to furnaces, from which castings were directly made, and its use by Mr. Lewis only corroborates other testimony we have given that there was a blast furnace at Lynn in 1644. There may also have been an "air furnace," or foundry, for melting "sowes" and old "gunnes." We have already stated our reasons for believing that there was a forge at Lynn as early as 1648, but whether it was supplied with iron from the furnace or from a bloomary fire is uncertain. Colonel Alexander Spottswood, of Virginia, stated to Colonel Byrd, in 1732, that "they ran altogether upon bloomeries in New England and Pennsylvania till his example had made them attempt greater workes"—that is, "a regular furnace" for making pig iron. Soon after Lynn first made iron there were numerous bloomaries established in New England, and it is entirely within the bounds of probability that, as a rule, the bar iron of New England during the seventeenth century, and even to a later period, was made from these bloomaries, and that the furnaces were occupied almost entirely in

making castings. This theory is perfectly consistent with the remark of Colonel Spottswood. The furnaces of New England may not have made pig iron as a regular product prior to the erection of his furnace, about 1715.

New Jersey was early prominent in the manufacture of iron, and at a later day in the supply of iron ore to its neighbors. At one time, near the close of the last century, it could boast about seventy-five bloomeries, besides other iron enterprises. Bishop says that the earliest ironworks in New Jersey "of which we have any account" were located at Shrewsbury, in Monmouth county, a town settled by immigrants from Connecticut in 1664. The iron ore of New Jersey had been discovered by the Dutch prior to this year. The date of the erection of the ironworks at Shrewsbury is not known, but it was probably subsequent to 1664. A grant of lands for mining purposes was made to Colonel Morris, the owner, October 25, 1676. In 1682 it is mentioned that "a smelting furnace and forge were already set up" in New Jersey, and Bishop thinks the works of Colonel Morris were referred to. Henry Leonard, one of the first ironworkers at Lynn, removed to Shrewsbury soon after 1664, "and is said to have set up one of the first forges in the province." If he set up a forge at all, we think it extremely probable that it preceded or formed the nucleus of Colonel Morris's works. Several bloomery forges were erected in Sussex and Morris counties about 1685 by immigrants from Old and New England, to smelt the Morris county ores. The ore for these forges was carried many miles "in leathern bags on pack-horses, and the iron was conveyed back in the same way over the Orange mountains to Newark."

The foregoing embraces all that needs to be said of the colonial iron manufacture in the seventeenth century.

IRONMAKING IN THE EIGHTEENTH CENTURY.

In 1702 Lambert Despard and others built "a smelting furnace" at the outlet of Mattakeeset pond, in the town of Pembroke, in Plymouth county, Massachusetts. In 1710 the celebrated Drinkwater ironworks were established at Abington, in the same county. In 1730 a forge was erected at Plympton, also in the same county. The first slitting-mill in the colonies, for slitting nail rods, is said by a recent writer to have been erected at Milton, in Norfolk county, Massachusetts, as early as 1710. In 1722 there was a "bloomery forge or ironworks" at Bridgewater, in Plymouth

county. In 1731 the number of slitting-mills in the colony had not been increased, but in 1750 there were four in operation; also "a plating-forge with a tilt-hammer and one steel furnace." In 1732 there were in Massachusetts "several forges for making bar iron, and some furnaces for cast iron or hollow-ware, and one slitting-mill, and a manufacture for nails." At the same time there were in all New England "six furnaces for hollow-ware and nineteen forgeries or bloomeries for bar iron."

Toward the middle of the century the iron manufacture of Massachusetts was extended westward, where brown hematite ore of good quality was obtained, the smelting of which continues in six furnaces in Berkshire county to this day. A furnace was built at Lenox, in this county, as early as 1765, the stack of which was exceptionally high for that day—28 feet. This furnace made pig iron in 1766. It is still running, the present stack having been built in 1837. A furnace was built in Worcester county previous to 1773, and a few years later there were several forges in the same county; also in 1793 several manufactories of edged tools. Toward the close of the century the manufacture of iron was also greatly extended in the eastern part of the State. A furnace was erected at Amesbury about 1790, and a bloomery forge at Boxboro. There was also a furnace at Wareham. Bishop says that "the two counties of Plymouth and Bristol had in operation in 1798 fourteen blast and six air furnaces, twenty forges and seven rolling and slitting mills, in addition to a number of trip-hammers and a great number of nail and smith shops." The furnaces and bloomeries which smelted bog ores, taken from the ponds of Eastern Massachusetts, in the infancy of the colony, have long been abandoned.

In 1735 Samuel Waldo erected a furnace and foundry on the Patuxet river, in Rhode Island, which were afterwards known as Hope furnace. They are said to have been the most important ironworks in the State during the eighteenth century. Cannon and other castings were made here during and after the Revolution. About the same time three other furnaces were erected at Cumberland, but they seem to have been abandoned before the Revolution. Before 1800 a slitting-mill had been erected on one of the branches of Providence river, a slitting and rolling mill at Pawtucket Falls, and other iron-manufacturing establishments in various parts of the State. The furnaces and bloomeries have long disappeared.

Connecticut made rapid strides in the manufacture of iron in the last century. In 1728 Joseph Higby, of Simsbury, obtained from

the Legislature a patent for manufacturing steel, probably German steel. About 1732 the since-celebrated brown hematite ore of Litchfield county was developed, now known as "the Salisbury district," and in 1734 a furnace was built at Lime Rock; possibly also a bloomery. Pig iron and castings are said to have been made here in 1736. In 1762 a blast furnace was built at Salisbury, which was rebuilt in 1770. During the Revolution it cast cannon and shot in large quantities. At Lakeville was another furnace. At Lakeville and Falls Village were two refining forges, with ten fires; at Furnace Village the Mount Riga furnace was built in 1800; in the town of Canaan a forge and slitting-mill were built after the Revolution, "and furnaces probably much earlier;" at Colebrook a forge and other ironworks "were erected either before or during the war," but were burned down in 1789; several furnaces were built on the Housatonic river soon after 1761; at New Milford there were seven forges before 1800. All these works were in Litchfield county, which contained at the close of the last century fifty forges and three slitting-mills, besides several furnaces. In 1800 nails were largely manufactured in this county.

At Bradford, in New Haven county, "a small iron-mill" was established as early as 1741, and in the same year a furnace was erected in the southern part of the State. Several bloomeries were in existence about 1775 on the streams flowing into Long Island sound, using principally bog ores. At Killingworth a steel furnace and a bloomery were erected previous to 1750. In 1761 the Rev. Jared Elliott was successful in producing steel in the bloomery from the black magnetic iron sand found on the coast. For this discovery he was awarded a medal in 1764 by the London Society of Arts. But the use of this sand never became general, although sand of exactly similar character is now smelted into iron, of a quality suitable for making steel, at Moisie, on the St. Lawrence river. In other parts of Connecticut ironworks were also established during the last century. Except ten furnaces in Litchfield county, all of which now make charcoal pig iron, the forges and furnaces of Connecticut have long ago disappeared.

The commencement of the iron manufacture in New Hampshire appears to date from about 1750, when several bloomeries were in existence, using bog ores. In 1791 mention is made of ironworks at Exeter. At Furnace Village, in 1795, the magnetic ore of Winchester was first smelted. Some bloomery forges, running upon bog ore, were in existence in the eastern part of the State about the

period of the Revolution. But there is not in operation to-day in the whole State a furnace or forge or rolling-mill, except the rolling-mill at Nashua.

Maine had a few bloomary forges in York county, and possibly elsewhere within her borders, during the Revolution and for some years later; but she has never had but one blast furnace, that at Katahdin, built in 1845, and now running. The forges long ago disappeared.

The iron manufacture was commenced in Vermont about the middle of the eighteenth century. Large deposits of magnetic and hematite ores had been found in its southern and western parts. In Rutland county an ore mine was opened in 1785, and in 1794 there were fourteen forges, three furnaces, and a slitting-mill in the county. At Pittsford there is now in active operation a charcoal furnace, the nucleus of which was one of these forges, built in 1791. In other counties there were seven forges in 1794, and before 1800 other forges and a slitting-mill were added; possibly some furnaces. Most of the furnaces and bloomaries ever erected in this State have been abandoned. Of the two bloomaries in operation in 1876, that at Fairhaven was built in 1796.

The following description of the mode in which nails were made in New England and other sections of the country in the last century is from a speech in Congress in 1789 by Fisher Ames:

It had become usual for the country people to erect small forges in their chimney-corners, and in the winter evenings, when little other work could be done, great quantities of nails were made even by children. These people took the rod iron of the merchant and returned him nails, and in consequence of this easy mode of barter the manufacture was prodigiously great.

The rule of the Dutch in New York continued until 1664, and it appears that during this period no ironworks of any kind were established in that colony, although the Holland Company encouraged the discovery of iron mines, and iron ore actually was discovered previous to 1653. After the territory passed into the hands of the English in 1664, a long time elapsed before any efforts were made to manufacture iron. A Parliamentary report, quoted very fully by Timothy Pitkin, in his *Statistical View*, states that there were no iron manufactures in New York as late as 1731. Bishop quotes Governor Cosby as stating in 1734 that "as yet no iron work is set up in this province." The same writer is of the opinion that the first ironworks in New York were "set up" as early as 1740 by

Philip Livingston on the Ancram creek, in Columbia county, only a few miles distant from the already-developed iron-ore deposits of Litchfield county, in Connecticut. The "works" embraced only a bloomary forge, the ore for which was obtained from the "ore hill" in Salisbury, Connecticut, about twelve miles distant. Scrivenor, in his *History of the Iron Trade*, states that in 1733 New York exported 11 cwt. and 3 qrs. of bar iron to England. In 1743 it exported 81 tons, 4 cwt., 2 qrs., and 17 lbs. of pig iron to England. But much of the iron thus exported may have been made in Connecticut or New Jersey. In 1750 Governor Clinton reported that at Wawayanda, in Orange county, there was "a plating-forge with a tilt-hammer," built four or five years before, but not then in use. "There was no rolling or slitting mill or steel furnace at that time in the province," and this forge was said to be the only one of its kind. In 1750 iron ore was found "at the south end of Sterling mountain," and in 1751 a blast furnace was built in Orange county. In 1752 a forge was built near the furnace, for forging anchors. A second furnace was built in 1777, and a second forge some time earlier. At Fort Montgomery, in the same county, a furnace was erected as early as 1756, but abandoned in 1777. In 1776 stoves for the government were cast at this furnace. In the same year the first steel made in the province was produced "in the German manner" at the works at Sterling.

Many furnaces and forges for smelting the rich ores of Sterling mountain and other ores in the vicinity were erected before the close of the eighteenth century. In 1756 two furnaces and several bloomaries in Cortland county, in the interior of the province, were reported to have been abandoned and not to have "been worked for several years." Forges were also erected a few miles north of that at Ancrim, but abandoned prior to 1800. In 1765 "a finery and great hammer for refining the Sterling pig iron into bars" are mentioned, but the location of the works is not stated. At Amenia, in Dutchess county, "a furnace and foundry were in operation during the Revolution . . . at which steel and castings were made for the use of the army."

Bishop states that the now-celebrated Champlain iron district of New York was not developed until after the Revolution, and he refers the erection of "the first iron works" in the district to 1801. Lesley, in his *Iron Manufacturer's Guide*, does not assign the erection of the oldest forge in the Champlain district to an earlier date than the year 1800. Nails were extensively manufactured at

Albany in 1787, and other iron enterprises than those noted were in existence in the State prior to 1800; but during the whole of the eighteenth century New York was relatively less prominent in the iron manufacture than it has been in this century.

There were many bloomaries erected in New Jersey during the eighteenth century, and others were built soon after its close. Lesley enumerates a large number of these primitive ironworks, most of them in Morris and adjoining counties. Magnetic ores were used in the northern part of the State, and bog ores in the southern. Professor T. Sterry Hunt, in a recent paper in *Harper's Magazine*, describes as follows the New Jersey bloomary, which was identical, we suppose, with the New England bloomary or forge of an earlier date.

The German bloomary furnace found its way to America, and was employed in New Jersey and Pennsylvania at least as early as 1725. This furnace had the great advantage that its construction required but little skill and little outlay. A small water-fall for the blast and the hammer, a rude hearth with a chimney, and a supply of charcoal and ore, enabled the iron-worker to obtain, as occasion required, a few hundred pounds of iron in a day's time in a condition fitted for the use of the blacksmith, after which his primitive forge remained idle until there was a farther demand. To this day such furnaces are found in the mountains of North Carolina, and furnish the bar iron required for the wants of the rural population. . . . Still more worthy of note is it that this primitive bloomary furnace, discarded in Europe, has been improved by American ingenuity, enlarged, fitted with a hot blast, water tuyeres, and other modern appliances, so that in the hands of skilled workmen in Northern New York it affords for certain ores an economical mode of making a superior malleable iron. . . . A large part of this product is consumed at Pittsburgh for the manufacture of cutlery steel of excellent quality.

The first blast furnace in New Jersey of which Bishop takes note has already been mentioned—that at Shrewsbury. He next mentions the furnace at Oxford, Warren county, built in 1742. It is said to be the oldest furnace now standing in the United States. It has, however, been converted from a charcoal to an anthracite furnace. A furnace was built "on the Morris county side of the Pequannock" previous to 1770, but abandoned two years later. Franklin furnace, in Sussex county, built in 1770, has been succeeded by one of the largest anthracite furnaces in the country—67 feet high and 23 feet wide at the bosh. The Hibernia furnace, in Burlington county, was built about 1769, and in 1776 was reported to be the only furnace in the province that was in blast. During the

Revolution this furnace and a furnace at Mount Hope were employed in casting shot and other supplies for the army. Union furnace, in Hunterdon county, was built prior to the Revolution, but abandoned in 1778. "Steel was made at Trenton during the Revolution." At Andover a blast furnace and forge were erected before the war, and in 1778 Congress took possession of them, the owners being royalists. A rolling and slitting mill was built at Boonton, Morris county, about 1790, and a rolling-mill at Dover, in the same county, in 1792. In 1800 there were in the county three rolling and slitting mills, two furnaces, "and about forty forges with two to four fires each." Furnaces were erected at Hamburg and Newton, in Sussex county, which have long been abandoned.

In the southern part of New Jersey several furnaces were built to smelt the bog ores of that section. Of these, Batsto furnace was built about 1766, and cast cannon-shot and bomb-shells for the Continental army. Sheet iron was made at Mount Holly in 1775, some of which was used to make camp-kettles. A nail manufactory was in operation at Burlington in 1797. In 1784 New Jersey had eight furnaces and seventy-nine forges. Most of the forges made iron directly from the ore. Of the numerous charcoal furnaces which once dotted Northern New Jersey and Southern New York, but one now remains which still uses charcoal—Greenwood furnace, in Orange county, New York, built in 1813. In 1876 there is but one bloomery in New Jersey that manufactures iron from the ore.

Pennsylvania was one of the last of the colonies to develop its iron resources. The Swedes, who were its first settlers, holding exclusive possession of its territory from about 1640 to 1680, made no iron within the limits of the "New Sweden." But William Penn, who sailed up the Delaware in the *Welcome* in 1682, had been familiar with the business of ironmaking in England. Samuel Smiles, in his *Industrial Biography*, says: "William Penn, the courtier Quaker, had iron-furnaces at Hawkhurst and other places in Sussex." It was, therefore, but natural that he should encourage the manufacture of iron in his province. In a letter written in 1683 he mentions "minerals of copper and iron in divers places." In other letters he expresses the wish that "the iron mine in the neighborhood of Schuylkill" may be developed. Penn died in 1718, and in the preceding year the first iron was made in Pennsylvania. The event is described in one of Jonathan Dickinson's letters, written in 1717, and quoted by Mrs. James in her *Memorial of Thomas Potts, Junior*. "This last summer one Thomas Rutter,

a smith, who lived not far from Germantown, hath removed farther up in the country, and of his own strength has set up on making iron. Such it proves to be, as is highly set by all the smiths here, who say that the best of Swede's iron doth not exceed it; and we have heard of others that are going on with the iron works."

In Day's *Historical Collections* mention is made of Samuel Nutt, who built a forge called Coventry, in the northern part of Chester county, which "went into operation about the year 1720," and made "the first iron" manufactured in Pennsylvania. Bishop says: "A forge is mentioned in March, 1719-20, at Manatawny, then in Philadelphia, but now in Berks or Montgomery county." The same writer also refers to a letter written by Dickinson in July, 1718, stating that "the expectations from the ironworks forty miles up Schuylkill are very great." Nutt's forge is located by Day in Chester county, on the opposite side of the Schuylkill from Montgomery county, and no authority claims that it was erected before 1720. His first purchase of land at Coventry (800 acres) appears to have been made in October, 1718; whereas, Mrs. James states that Rutter opened "the old mines at Colebrookdale" in 1714. Elsewhere she states that he removed in 1714 from Germantown "forty miles up the Schuylkill, . . . in order to work the iron mines of the Manatawny region." The following obituary notice in the *Pennsylvania Gazette*, published at Philadelphia, dated March 5 to March 13, 1729-30, ought to be conclusive proof of the priority of Thomas Rutter's enterprise: "March 13. On Sunday night last died here Thomas Rutter, Sen., of a short illness. He was the first that erected an ironwork in Pennsylvania."

Where was this first "ironwork?" If on the Manatawny creek, on what part of the creek? Mrs. James expresses the opinion that the "ironwork" was Pine forge, and that it was situated "five miles above Pottstown, and more than four miles below Colebrookdale furnace." Pool forge, three miles from Pottstown, on the Manatawny, was attacked by the Indians in 1728, who were repulsed.

Mrs. James says that Thomas Rutter "erected both furnaces and forges for the making of iron" on the Manatawny. She "is inclined to think" that the first furnace was established by Rutter on the banks of the Schuylkill, near the Pottstown bridge. She says of Samuel Nutt, that, on French creek, in Coventry township, Chester county, he built both furnaces and forges before his death in 1737.

In 1728 there were four furnaces in blast in the province, one of which was Colebrookdale, on the Manatawny. Another was within

the present limits of Lancaster county. Bishop says "the first iron-works in the county is supposed to have been built by a person named Kurtz, in 1726; the enterprising family of Grubbs commenced operations in 1728." Warwick furnace, on French creek, was built in 1737; Redding furnace, also on French creek, in 1736-7; Mount Pleasant, on Perkiomen creek, thirteen miles above Pottstown, in 1738; Cornwall, in Lebanon county, by Peter Grubb, in 1742; Colebrook, in the same county, in 1745; Elizabeth, in Lancaster county, in 1756. Many other furnaces were built in Eastern and Southeastern Pennsylvania prior to the Revolution, and many forges and bloomeries. Most of the bar iron made in those days in Pennsylvania was hammered at the forges out of blooms made from pig iron. The Pennsylvania furnaces were also employed in making castings, including stoves. The stove which Franklin invented was first cast at Warwick furnace about 1742.

Valley forge, in Chester county, has historic associations which no American can ever forget. This forge seems to have been erected some time prior to 1757 by Stephen Evans, who sold it in that year to John Potts. Its original name was Mount Joy. The iron used at Valley forge was made at Warwick furnace.

The first rolling and slitting mill in Pennsylvania was built in Thornbury township, Chester county, in 1746, by John Taylor. In 1750 there was a plating forge with a tilt-hammer in Byberry township, Philadelphia county, and two steel furnaces within the city limits, one of which (Paschal's) was built in 1747. The manufacture of iron in the Lehigh district received an early start, but full particulars are wanting. There was a furnace at Durham, in Bucks county, as early as 1743, and a forge at Easton in 1778, named Chelsea. Maria forge, in Carbon county, was built in 1753. About 1789 there were fourteen furnaces in operation in Pennsylvania and thirty-four forges.

The first blast furnace in the Juniata Valley was Bedford furnace, built as early as 1785 on the site of the present town of Orbisonia, in Huntingdon county, by the Bedford Company, composed of Edward Ridgley, Thomas Cromwell, and George Ashman. It made from eight to ten tons of pig iron a week, which was about the average product of all the furnaces of that day. A few years later Melinda furnace was erected on Lughwick creek, near Orbisonia. A forge was built on the same creek by the Bedford Company about a mile and a half from their furnace, which supplied the neighborhood with horse-shoe iron, wagon tire, harrow teeth,

etc. Large stoves, among other articles, were cast at Bedford furnace. In the exhibit of the American Society of Civil Engineers at the Philadelphia Exhibition may be found a stove-plate cast at this furnace in 1789. The first American bar iron ever taken to Pittsburgh is said to have been made at the Bedford forge. There was then no wagon road to Pittsburgh. "In the forge the pig iron of the furnace was hammered out into bars about six or eight feet long, and these were bent into the shape of the letter **U** and turned over the backs of horses and thus transported over the Alleghenies to Pittsburgh." Huntingdon furnace, in Franklin township, was built in 1796, by George Anshutz and John Gloninger; and Barree forge, between Spruce Creek and Petersburg, was built about 1794, by Edward Bartholomew and Greenberry Dorsey. It is stated that the first forge in Centre county was built about 1790 by a noted ironmaster of that day, General Philip Benner. The Centre furnace, nine miles southwest of Bellefonte, was also built in 1790.

"The first furnace west of the Alleghenies is said to have been built by Turnbull & Marmie, of Philadelphia, on Jacob's creek, between Fayette and Westmoreland counties, fifteen miles above its entrance into the Youghiogheny river. It was first blown in November 1, 1790, and produced a superior quality of metal both for castings and bar iron, some of it having been tried the same day in a forge which the proprietors had erected at the place." This statement is by Bishop. He does not give the name of the furnace. Union furnace, on Dunbar creek, fourteen miles east of Brownsville, was built in 1792-3 by Colonel Isaac Meason and others. Fairchance furnace and forge, seven miles south of Uniontown, were built in 1794 by F. H. Oliphant. Mount Vernon furnace, on Jacob's creek, fifteen miles east of its mouth, was built in 1801 by Colonel Meason. From 1790 to 1800 it is stated that twenty-one furnaces were built in Pennsylvania. One of these was located within about three miles of Pittsburgh, near the present suburb of Shady Side. The first nail factory west of the Alleghenies was built at Brownsville, before 1800, by Jacob Bowman, at which wrought nails, made by hand, were produced.

The first steel works in Pennsylvania are said by Mrs. James to have been erected on French creek, in Chester county, prior to 1734, by Samuel Nutt. They were known as the Vincent steel works.

On the 24th of September, 1717, says Mrs. James, Sir William Keith, Governor of Pennsylvania, "wrote to the Board of Trade

in London that he had found great plenty of iron ore in Pennsylvania." At that time Delaware was embraced within the limits of Penn's province. Bishop quotes Oldmixon as mentioning in 1708 a deposit of iron ore called "iron hill" in New Castle county, (in Delaware,) between Brandywine and Christiana; and Bishop himself says that "Sir William Keith had iron works in that county, erected previous to 1730, and probably during his administration from 1717 to 1726." Tradition says that this enterprise consisted of a furnace which was located on Christiana creek. Sussex county, in the southern part of the State, contained many charcoal furnaces and forges near the close of the last century, for smelting and refining the rich bog ore found within its limits, but all these disappeared about 1830. There is not to-day a furnace or forge in the State.

In his *Report on the Manufacture of Iron*, addressed to the Governor of Maryland, Alexander gives 1715 as the "epoch of furnaces in Maryland, Virginia, and Pennsylvania." Scrivenor says that in 1718 Maryland exported to England 3 tons and 7 cwts. of bar iron, upon which the mother country levied a duty of £6 19s. 1d. In 1719 the Legislature of Maryland passed an act "authorizing 100 acres of land to be laid off to any who would set up furnaces and forges in the province." Other inducements were offered to those who would engage in the manufacture of iron. Official reports show that in 1749 and again in 1756 there were eight furnaces and nine forges in Maryland, and that on the 21st of December, 1761, there were eight furnaces, making about 2,500 tons of pig iron annually, and ten forges, capable of making about 600 tons of bar iron.

The first ironworks in Maryland were undoubtedly erected in the northeastern part of the State. Principio furnace and Russell's forge, in Cecil county, were certainly among the first, if they were not the very first, of these enterprises. The forge was in operation previous to 1722. This forge, afterwards known as Principio forge, was situated at the head of Chesapeake bay, and the pig iron from Principio furnace and from furnaces in Virginia was converted by it into bar iron. Bush furnace, a furnace called Onion's, and Northampton furnace were erected previous to 1760. On Jones's falls, near Baltimore, was the Mount Royal forge; on a branch of Gwinn's falls stood the furnace and forge of the Baltimore Company; on the Patapsco, near Elkridge Landing, was Elkridge furnace and a rolling and slitting mill; at a locality not now known was York furnace; in Anne Arundel county were the Patuxent furnace and forge. In Frederick county were several other iron

enterprises, including two furnaces built about 1765 and soon abandoned. Catoctin furnace, northwest of Fredericktown, was built in 1774. About 1775 the Johnsons built a slitting and rolling mill and a forge on Bush creek; Johnson furnace, near the mouth of the Monocacy; and Bloomsbury forge, on a branch of the same stream. Fielderea furnace, three miles south of Fredericktown, was abandoned after the first blast was made. In Washington county, near the Potomac river, was Green Spring furnace, erected in 1770. Soon afterward Licking creek forge was erected. About 1770 Samuel and Daniel Hughes built Mount Etna furnace and Antietam forge, near Hagerstown. At the furnace cannon were cast during the Revolution.

The foregoing details are mainly gathered from Mr. Alexander's report. Bishop mentions several additional furnaces and other iron establishments in Maryland which were built during the last century, some of them in Alleghany county; and both writers refer to still other iron enterprises which were originated soon after its close.

The manufacture of iron in Virginia was virtually suspended for almost a century after the disastrous experiment on Falling creek. We have quoted Alexander as authority for the belief that furnaces were built in Virginia about 1715. Bishop alludes to a journal left by Colonel William Byrd, containing an account of his visit, in 1732, to the iron mines and furnaces of Colonel Alexander Spottswood, on the Rappahannock river, in Spottsylvania county. Colonel Byrd learned from Colonel Spottswood that he was "the first in North America who had erected a regular furnace," but the date of its erection is not given. Bishop, however, fixes it before 1724, and says it "was possibly built some years before." We have no record of shipments abroad of Virginia iron prior to 1728-9. Colonel Spottswood informed Colonel Byrd that at the time of his visit there were four furnaces in Virginia, but no forge. His principal furnace was located at Fredericksburg, the ore being obtained thirteen miles away. "He had also a very complete air furnace with two fires, recently erected for smelting sow metal for foundry work, situated at Massaponny, on the Rappahannock, . . . to which the metal was carted from the smelting furnace." At this air furnace there were cast "backs for chimneys, andirons, fenders, plates for hearths, pots, skillets, mortars, rollers for gardeners, boxes for cart wheels, etc., which, one with another, could be delivered at people's doors at 20s. a ton." The Fredericksburg furnace was operated for many years. Bishop says:

"The supply of water often failed and put out the furnace." On the opposite side of the Rappahannock from Fredericksburg, twelve miles distant, on a branch of the Potomac, was a furnace known as "England's ironworks," so named after the chief manager.

In the Valley of Virginia many furnaces and forges were erected prior to the Revolution. Zane's furnace and forge on Cedar creek, in Frederick county, are said to have been the oldest ironworks in the valley; Pine forge, in Shenandoah county, was built in 1725; in Augusta county a forge was built in 1757 on Mossy creek; on the same creek a furnace was built in 1760; Isabella furnace, in Page county, was also built in 1760. Union forge, in Augusta county, and Gibraltar forge and Buffalo forge, in Rockbridge county, were built about 1800. A furnace in Rockingham county and Moore's furnace in Rockbridge county were built at an earlier day.

A furnace was built in Loudon county and a forge in Carroll county before 1800. In the southwestern part of the State several furnaces were erected about 1800. At Lynchburg, formerly Lynch's Ferry, were several furnaces in the last century. During the Revolution Virginia was not so prominent as some of her sister colonies in the manufacture of iron, but after the peace it made fair progress.

North Carolina is entitled to the honor of first giving to Europeans the knowledge that iron ore existed within the limits of the present United States. The discovery was made by the expedition under Sir Walter Raleigh in 1585. No attempt, however, appears to have been made to develop the iron resources of North Carolina until the last century. Scrivenor says that in 1728-9 there were imported to England from "Carolina" 1 ton and 1 cwt. of pig iron, and in 1734 2 qrs. and 12 lbs. of bar iron. Shipments of pig and bar iron were made in subsequent years down to the Revolution. "John Wilcox was the proprietor of a furnace and iron works on Deep Run in the beginning of the war. There were also iron works in Guilford county, probably on the same stream." A furnace and forge were also built before the war on Buffalo creek, in Cleveland county. Prior to 1800 there were in operation in Lincoln county four forges, two bloomeries, and two furnaces. One of the furnaces, Vesuvius, built in 1780, was in operation down to 1873. Of other iron enterprises in North Carolina in the last century we condense from Lesley the following information: Six miles northeast of Danbury a bloomery was built in 1780; another, ten miles southwest, in 1796, and one, nineteen miles west, in 1791. In Surry county, near the Yadkin, ironworks were erected a few

years after the Revolution, probably by Moravians from Pennsylvania, who had settled in the county as early as 1753. On the same stream, in Wilkes county, a forge was also built near the same time. A furnace and forge were also erected in Rockingham county. In Burke county were two bloomaries and two forges before the close of the last century.

In 1876 it is probable that there is not a blast furnace nor a forge nor a rolling-mill nor a steel works in operation in all South Carolina. Yet this State made iron in considerable quantities during the Revolution and subsequently; and there are now standing eight furnace stacks in proximity to ore beds and hard-wood forests in York, Union, and Spartanburg counties. Just prior to our late civil war four of these furnaces were in operation; also a rolling-mill in Spartanburg county, and a bloomary each in York and Union counties. In the northwestern part of South Carolina, including the counties above mentioned, are the magnetic ores of the State, and here, according to Dr. Ramsay, quoted by Bishop, the first ironworks were erected by Mr. Buffington in 1773, but were destroyed by the Tories during the war. Several forges and furnaces were erected after the peace, the principal of which were the *Æra* and *Etna* furnaces and forges in York county. The *Æra* was built in 1787 and the *Etna* in 1788.

The first iron enterprise in Kentucky is said by Lesley to have been the charcoal furnace erected by government troops in 1791 on Slate creek, a branch of Licking river, in Bath county, then Bourbon. "A large number of furnaces and forges were built within a few years after in Estill, Edmondton, Greenup, and other counties in Eastern Kentucky, which have been long abandoned."

The first settlers of Tennessee erected ironworks within its limits before it became a territory. A bloomary forge was built in 1790, at Emeryville, eight miles southeast from Washington College. At Elizabethtown, on Doe river, in Carter county, the bloomary of Messrs. Carter & Co. was built in 1795. A bloomary was also erected on Camp creek, in Greene county, in 1797. Wagner's bloomary, on Roane's creek, in Johnson county, is said to have been built in 1795. Two bloomaries in Jefferson county; the Mossy creek forge, ten miles north, and Dumping forge, five miles west, of Dandridge, were built about the same year. About the same time, if not earlier, Mr. David Ross, the proprietor of ironworks in Campbell county, Virginia, erected a large furnace and forge at the junction of the north fork of the Holston with the main stream

near the Virginia line. A bloomary was also set up, at this time, below the mouth of the Watauga, and another thirty miles above Knoxville. A furnace was once built in Polk county. Bishop states an interesting fact in the following words: "Boats of 25 tons burden could ascend to Ross's iron works, nearly 1,000 miles above the mouth of the Tennessee, and about 280 above Nashville. At Long Island, a short distance above, on the Holston, where the first permanent settlement in Tennessee was made in 1775, boats were built to transport iron and castings made in considerable quantities at these works, with other produce, to the lower settlements and New Orleans."

Nashville was founded in 1780, and a few years later iron ore was discovered about thirty miles south of the future city. Between 1790 and 1795 a charcoal furnace was erected on the iron fork of Barton's creek, in Dickson county, seven miles west of Charlotte. This furnace was rebuilt in 1825, and was in operation in 1875.

We have been unable to learn of ironworks having been established in any other States of the Union prior to the beginning of the present century. With the possible exception of Georgia, all the thirteen colonies made iron before the Revolution.

EXPORTS OF COLONIAL IRON.

The reader of the foregoing details of the growth of the iron industry of this country during the seventeenth and eighteenth centuries will be impressed with the extent and variety of this industry. The colonists, with true English enterprise and resolution, had made great progress in supplying themselves with iron and iron products. As early as 1718 they had even commenced to export iron to the mother country, and every year thereafter down to the beginning of the Revolutionary struggle their iron export trade steadily grew in importance, notwithstanding many embarrassments originating with the mother country herself. They were not permitted to export their iron to any country but Great Britain, and not to Ireland until 1765. In 1750 an act of Parliament took effect which prohibited the erection in the colonies of slitting or rolling mills, plating forges, or steel furnaces. We present below a table, compiled from Scrivenor's *History of the Iron Trade*, showing the quantity of colonial iron exported to England from 1718 to 1776, inclusive. The colonies which made

the shipments were New England, New York, Pennsylvania, Maryland, Virginia, and the Carolinas.

Years.	Pig Iron.				Bar Iron.				Years.	Pig Iron.				Bar Iron.			
	Tons.	cwt.	gr.	lbs.	Tons.	cwt.	gr.	lbs.		Tons.	cwt.	gr.	lbs.	Tons.	cwt.	gr.	lbs.
1718	.....	...	...	...	3	7	0	0	1751	3,210	11	1	0	5	4	2	9
1728-9	1,132	2	3	4	.....	...	...	...	1752	2,980	1	3	2	81	7	0	26
1730	1,725	14	3	7	.....	...	...	...	1753	2,737	19	3	27	247	19	3	11
1730-1	2,250	5	3	14	.....	...	...	...	1754	3,244	17	1	23	270	15	1	4
1731-2	2,332	14	3	15	.....	...	...	...	1755	3,441	2	3	8	389	18	3	20
1732-3	2,404	17	1	12	.....	...	...	...	1761	2,766	2	3	12	39	1	0	0
1733	.....	...	...	...	11	3	0	0	1762	1,766	16	0	2	122	12	2	14
1733-4	2,197	10	1	14	.....	...	...	...	1763	2,566	8	0	25	310	19	3	2
1734	.....	...	...	...	2	12	.....	.....	1764	2,554	8	3	21	1,059	18	0	10
1734-5	2,561	14	3	11	.....	...	...	...	1765	3,264	8	1	22	1,078	15	0	16
1735	.....	...	...	...	55	6	3	21	1766	2,887	5	1	15	1,257	14	3	9
1739	2,417	16	2	4	.....	...	...	...	1767	3,313	2	1	19	1,325	19	0	18
1740	2,275	7	1	0	5	4	1	21	1768	2,953	0	2	14	1,989	11	0	6
1741	3,457	9	0	18	5	0	0	0	1769	3,401	12	2	2	1,779	13	1	23
1742	2,075	0	0	23	.....	...	...	...	1770	4,232	18	1	18	1,716	8	0	21
1743	2,985	9	2	8	.....	...	...	...	1771	5,303	6	3	13	2,222	4	3	24
1744	1,861	16	1	22	57	0	0	0	1772	3,724	19	2	25	965	15	0	23
1745	2,274	5	1	17	4	5	2	14	1773	2,937	13	0	2	837	15	0	6
1746	1,861	2	3	13	196	18	0	12	1774	3,431	12	2	19	639	0	0	23
1747	2,156	15	3	16	82	11	2	11	1775	2,996	0	2	24	916	5	2	11
1748	2,155	15	2	23	4	0	0	0	1776	316	1	2	8	28	0	0	0
1750	2,924	0	0	20	5	17	3	0									

In addition to the foregoing, there were exported to Scotland 264 tons of pig iron and 11 tons of bar iron in ten years, from 1739 to 1749, and 229 tons of pig iron in six years, from 1750 to 1756. In the year 1770, according to Timothy Pitkin, the following quantities of iron were exported to all countries, including England, which is given above separately: Pig iron, 6,017 tons, valued at \$145,628; bar iron, 2,463 tons, valued at \$178,891; castings, 2 tons, valued at \$158; and wrought iron, 8 tons, valued at \$810. These are all the particulars that are obtainable of our colonial export iron trade.

From 1776 to 1791 there is no record of any shipments abroad of American iron, although doubtless some iron was shipped in each year after the peace. The present government of the country was not established until 1789, and down to that period each colony controlled its own commercial exchanges. The reader will find full details of our exports of iron and steel from 1791 to 1876 tabulated in the latter part of this report.

IRONMAKING IN THE NINETEENTH CENTURY.

According to an article in the *Youngstown Tribune*, the manufacture of iron in Ohio was commenced soon after the opening of the present century. In 1803 a small charcoal furnace was erected on Yellow creek, about one mile from its mouth, in Poland township,

in Mahoning county, then Trumbull. The pioneer ironmaster was Daniel Heaton. The furnace was small and produced from two to three tons per day, principally in the form of pots, kettles, and small hardware. It was not a financial success, and only ran about three years. In 1806 James Heaton built a stack on Mosquito creek, in the village of Niles, located where the splendid union school building now stands. This furnace was in operation down to 1854. In 1806 David Montgomery built a second stack on Yellow creek, about half a mile from its mouth. In 1808 he associated with him Robert Alexander, David Clendennin, and Captain John Struthers, who, under the firm name of Montgomery, Clendennin & Co., operated the furnace with success down to 1812, at which time every able-bodied man about the place was drafted and marched to the frontier. The furnace was never blown in again. Colonel Charles Whittlesey, of Cleveland, states that in 1809 James Heaton built a refining forge at Niles, for the manufacture of bar iron with charcoal from the pig of the Yellow creek furnace. This forge produced the first hammered bars in the State.

The beginning of the iron industry in the vicinity of Cleveland probably dates from 1825, when Arcole furnace was built in Madison township, in the present county of Lake, by Root & Wheeler; Concord furnace, in the same county, by Fields & Stickney; Railroad furnace, in Geauga county, by Thorndike & Drury. Several other furnaces were soon afterward erected in Lake, Geauga, Ashtabula, Cuyahoga, Loraine, and Huron counties. A furnace called Vermilion, between Sandusky and Cleveland, on the lake, may have been built before 1825.

Various authorities agree in the statement that the first furnace in the southern part of Ohio was the Brush creek furnace, erected in 1812 in Adams county. Two other furnaces were built in this county in 1816. These three furnaces were abandoned about 1826, when the Hanging Rock region was developed. Union furnace in Lawrence county was built in that year; Hecla in 1833; Etna in 1832; Buckhorn in 1833; Mount Vernon in 1833; Lawrence in 1834; Lagrange in 1836; Franklin furnace in Scioto county in 1827; Junior in 1832; Clinton in 1832; Bloom in 1832. The first iron smelted in the Hanging Rock region was by Richard Deering, in a cupola, in 1815. In 1875 there were in existence in the district thirty-four furnaces which were built to use charcoal, but it is exceedingly probable that in a very few years most of these will be converted to the use of bituminous coal and coke, as

has already been done with other charcoal furnaces in the same section.

About 1816 Aaron Norton built a furnace at Middlebury, near Akron, in Summit county, Ohio, and in 1819 Asaph Whittlesey built a forge on the Little Cuyahoga, near Middlebury. A furnace at Tallmadge in the same county was built about the same time. Moses Dillon built a furnace and forge on Licking river in Muskingum county, near Zanesville, about 1816, possibly earlier. Mary Ann furnace, ten miles northeast of Newark, in Licking county, was built about 1816.

The development of the Hanging Rock iron region of Kentucky was commenced in Greenup county, as we have already stated, late in the last century. It was continued during the early years of the present century, and subsequently. A majority of all the furnaces of the State are still in that section. The Steam furnace, four miles from Greenupsburg, was first built in 1817, according to Lesley, and Argolite furnace, ten miles south of Greenupsburg, in 1818. Pactolus furnace was built near Argolite furnace soon after 1818. Camp Branch or Farewell furnace was built about 1818, fourteen miles from Greenupsburg, and abandoned soon afterward. The most activity in the building of furnaces in the Hanging Rock region of Kentucky was displayed after 1826, when the development of the same region in Ohio began. Several large furnaces have recently been built in Kentucky to use bituminous coal and coke, and others to use charcoal. In the whole State there are, in 1876, twenty-three furnaces and ten rolling-mills. Louisville is an important iron centre in 1876.

The iron industry of Pittsburgh, now the most important iron centre in the country, did not have an existence in the last century, although a blast furnace was built within a few miles of the town before its close, as already stated. The first iron foundry in Pittsburgh was established in 1803 by Joseph McClurg. In 1812 it was converted by him into a cannon foundry. In 1807 there were four nail factories, one of which made 100 tons of cut and hammered nails annually. In 1810 about 200 tons of cut and wrought nails were made in Pittsburgh. When the first steamboat on the Ohio river, the "New Orleans," was built at Pittsburgh in 1811, her engine, boiler, and all her machinery were built by native mechanics. In 1813 there were two foundries in Pittsburgh (McClurg's and Beelen's); one steel "furnace," owned by Tuper & McKowan, and one rolling-mill, erected in 1811 and 1812, owned by C. Cowan.

Cowan's rolling-mill was the first in Pittsburgh, and was known as the Pittsburgh rolling-mill. The second was the Union rolling-mill, built in 1819, and accidentally blown up and permanently dismantled in 1829. It is stated that in this mill was done the first puddling in America. The following rolling-mills were in operation in Pittsburgh in 1826: Sligo mill was erected where it now stands by Robert T. Stewart and John Lyon in 1825, but was partly burned down that year. The Juniata ironworks were owned by Dr. Peter Shoenberger, and were erected in 1824. Grant's Hill works were erected in 1821 by William B. Hays and David Adams. The Union rolling-mill, located east of Kensington, (Pipetown,) was the largest and most extensive of the kind in the western country. It was built in 1819, and owned by Messrs. Baldwin, Robinson, McNickle & Beltzhoover. The Dowlais works, in Kensington, were erected by Mr. Lewis in 1825. At Penn street and Cecil's alley stood the Pittsburgh rolling-mill, established by C. Cowan in 1812, and in 1826 owned by R. Bowen. On Pine creek was the mill of M. B. Belknap, operated by both steam and water power. In 1825 there were "eight air foundries and a cupola furnace" in Pittsburgh. Pig metal for the supply of these foundries and the rolling-mills was obtained from blast furnaces in the neighboring counties, but much of it was brought from the Juniata valley, which also supplied the mills with most of their blooms. The pig iron and blooms were hauled over the Allegheny mountains on sleds to Johnstown in the winter season, and taken down the Conemaugh, Kiskiminetas, and Allegheny rivers to Pittsburgh with the spring freshets. In 1829 Pittsburgh contained eight rolling-mills, using 6,000 tons of blooms, chiefly from the Juniata valley, and 1,500 tons of pig metal. In 1830 the iron rolled was 9,282 tons. It is stated that in 1830 one hundred steam-engines were built. In 1831 there were two steel "furnaces," and cast iron began to be used for pillars, the caps and sills of windows, etc. In 1836 there were nine rolling-mills in operation, and eighteen foundries, engine-factories, and machine-shops.

There were no blast furnaces in Pittsburgh and Allegheny county eighteen years ago, but now there are eleven, and a new stack is in course of erection. There are thirty-two rolling-mills in Pittsburgh and Allegheny county in 1876, four of which make steel as well as iron. There are nine other establishments which make only steel.

Bishop states that the number of furnaces in Pennsylvania in 1805 was sixteen, and of forges, thirty-seven. Of the latter, eleven were west of the Alleghenies. We presume his allusion is to *active*

establishments. The number of ironworks erected in the State in the ten years ending with 1830 was forty-nine, of which thirty were forges and rolling-mills, and seventeen were blast furnaces. A rolling-mill was commenced in 1816 and put in operation in 1817 on Redstone creek, about midway between Connellsville and Brownsville, at a place called Middletown, Fayette county, Pennsylvania. The property belonged to Isaac Meason, Sr., of Dunbar furnace.

In 1810 there were in Massachusetts thirteen rolling and slitting mills, in which about 3,500 tons of bar iron, chiefly Russian, were rolled or slit. The manufacture of cut nails had become a prominent industry in this year. In 1830 about 1,500,000 pounds of cut nails, equivalent to 15,000 kegs, were exported to foreign countries. In 1832, owing largely to the completion of the Morris canal, the counties of Sussex, Warren, Morris, and Bergen in New Jersey contained fifteen furnaces and eighty-seven forge fires in operation.

Down to 1838 all the blast furnaces in the United States, with the exception of a very few coke furnaces, used charcoal for fuel. In that year pig iron was made at Mauch Chunk from anthracite coal. As this event marks the beginning of a new era in the history of ironmaking in this country, we present below a complete account of the first steps that were taken to use the new fuel in blast furnaces.

In 1840 Jesse B. Quinby testified, in the suit of Farr & Kunzi *versus* The Schuylkill Navigation Company, that he used anthracite coal at Harford furnace in Maryland, mixed with one-half charcoal, in 1815. He believed himself to be the first person in the United States to use anthracite coal in smelting iron. In 1827 unsuccessful experiments in smelting iron ore with anthracite coal from Rhode Island were made at one of the small blast furnaces in Kingston, Plymouth county, Massachusetts. Walter R. Johnson, in his *Notes on the Use of Anthracite*, says that, "among the earliest attempts to use anthracite for smelting iron may be mentioned that of certain members of the Lehigh Coal and Navigation Company, who, in the year 1820,* erected near Mauch Chunk a furnace intended for that purpose. This first attempt on the Lehigh resulted in nearly the same manner as did a similar trial at Vizille [about 1827], on the borders of France and Switzerland, where it was attempted to use anthracite either alone or in connection with other fuel. This last, it is well known, was abandoned in despair." These experiments failed because the blast used was cold.

* Johnson says 1820, but 1826 is believed to be the correct date.

In 1828 James B. Neilson, of Scotland, obtained a patent for the use of hot air in the smelting of iron ore in blast furnaces, and in 1837 the smelting of iron ore with anthracite coal by means of the Neilson hot blast was successfully accomplished by George Crane, at his ironworks at Ynyscedwin, in Wales. Mr. Crane began the use of anthracite with hot blast on the 7th of February, 1837, in a cupola blast furnace: product, 34 to 36 tons a week. In May of that year Solomon W. Roberts of Philadelphia visited his works and witnessed the complete success of the experiment. Mr. Crane had taken out a patent on the 28th of September, 1836, for smelting iron ore with anthracite coal. Upon the recommendation of Mr. Roberts, after his return from Wales, the Lehigh Crane Iron Company was organized in 1838 to manufacture pig iron from the anthracite coal of the Lehigh valley. In that year Erskine Hazard went to Wales for the company, and there made himself acquainted with the process of making anthracite iron. He ordered such machinery as was necessary to be made—under the direction of George Crane, the inventor—and engaged David Thomas, who was familiar with the process, to take charge of the erection of the works and the manufacture of the iron. Mr. Thomas arrived in the summer of 1839, and to his faithful and intelligent management much of the success of the enterprise is due. The first furnace of this company was successfully blown in on the Fourth of July, 1840. But it was not the first successful anthracite furnace in this country. To William Firmstone, one of the oldest and most eminent of living American ironmasters, and to Johnson's *Notes* we are indebted for the following details of the earliest successful efforts to make pig iron from anthracite coal in the United States.

On the 19th of December, 1833, a patent was granted to Dr. F. W. Geissenheimer, of New York, for smelting iron ore with anthracite, by the application of heated air. Dr. Geissenheimer made experiments in smelting iron ore with anthracite at the Valley furnace, near Pottsville, but they were not successful. During the fall and winter of 1837 Messrs. Joseph Baughman, Julius Guiteau, and Henry High, of Reading, experimented in smelting iron ore with anthracite coal in an old furnace at Mauch Chunk, using about eighty per cent. of anthracite. The results were so encouraging that they built a small water-power furnace near the Mauch Chunk weigh-lock, which was completed in July, 1838. Blast was applied to this furnace August 27th, and discontinued September 10th, the temperature being heated up to about 200° F. The fuel

used was mainly anthracite, but not exclusively. A new heating apparatus was procured, consisting of 200 feet of cast-iron pipe, 1½ inches thick, placed in a brick chamber at the tunnel head, and heated by a flame therefrom. Blast was applied late in November, 1838, the fuel used being anthracite exclusively, and "the furnace worked remarkably well for five weeks," up to January 12, 1839, when it was blown out for want of ore. Some improvements were made, and on July 26, 1839, the furnace was again put in blast and so continued until November 2, 1839, Mr. F. C. Lowthorp, C. E., of Trenton, being one of the partners at this time. For "about three months" no other fuel than anthracite was used, the temperature of the blast being from 400° to 600° F. Open tuyeres were used. About 100 tons of iron were made.

The next furnace to use anthracite was built in 1837 at Pottsville, Pennsylvania, by William Lyman, under the auspices of Burd Patterson, and blast was unsuccessfully applied July 10, 1839. Benjamin Perry, who had blown in the coke furnace at Farrandsville, Pennsylvania, then took charge of it, and blew it in October 19, 1839, with complete success. This furnace was blown by steam-power. The blast was heated in ovens at the base of the furnace, with anthracite, to a temperature of 600°, and supplied through three tuyeres at a pressure of 2 to 2½ lbs. per square inch. The product was about 40 tons a week of good foundry iron. A premium of \$5,000 was paid by Nicholas Biddle and others to Mr. Lyman, as the first person in the United States who had made anthracite pig iron continuously for one hundred days. The furnace continued in blast for some time. Danville furnace, in Montour county, Pennsylvania, Biddle, Chambers & Co., proprietors, was built in 1839, and successfully blown in with anthracite in April, 1840, producing 35 tons of iron weekly with steam-power. Roaring creek furnace, in Montour county, Burd Patterson & Co., proprietors, built in 1839, was next blown in with anthracite, May 18, 1840, and produced 40 tons of iron weekly with water-power. A charcoal furnace, at Phoenixville, built in 1837, Reeves, Buck & Co., proprietors, was blown in with anthracite June 17, 1840, by William Firmstone, and produced from 28 to 30 tons of pig iron weekly with water-power. The hot-blast stove, which was planned and erected by Julius Guiteau, of the Mauch Chunk furnace, was situated on one side of the tunnel head, and heated by the escaping flame of the furnace. This furnace continued in blast until 1841. Columbia furnace, at Danville, George Patterson, proprietor, was

built in 1839, and blown in with anthracite by Mr. Perry, July 2, 1840, and made from 30 to 32 tons of iron weekly, using steam-power. The next furnace to use anthracite, and the last one we shall mention, was built at Catasauqua, for the Lehigh Crane Iron Company, in 1839, by Mr. David Thomas. It was successfully blown in by him on the Fourth of July, 1840, and produced 50 tons a week of good foundry iron, water-power being used. The furnace is still in existence, and doing good work. Mr. Firmstone remarks that,

At three of the above-mentioned furnaces, viz., Mauch Chunk, Phoenixville, and Columbia, the hot-blast ovens were heated by the flame escaping from the furnace; at the others, the ovens and boilers were on the ground, and heated by independent fires. At that early day, the plan, now so general, of conveying the escaping gas in air-tight conduits to the boilers and ovens, was not adopted. It was introduced by Mr. C. E. Detmold, a German engineer, now of New York, two or three years later.

It will be observed that, while Mr. Neilson invented the hot blast, Dr. Geissenheimer was the first to propose the use of anthracite coal by means of heated air for the manufacture of pig iron, and that Mr. Crane was the first to successfully apply the hot blast of Mr. Neilson to this purpose. Dr. Geissenheimer experimented as early as 1833 with ovens for heating air before its introduction into the blast furnace in which anthracite was used as a fuel, and his patent bears date in that year; but his invention was not successfully applied until after Mr. Crane had made iron at Ynyscedwin. Dr. Geissenheimer is entitled to the honor of having proposed what Mr. Crane was the first to accomplish. His patent, limited to the United States, was purchased by Mr. Crane, who, in November, 1838, patented some additions to it in this country. The patent was never enforced here, but Mr. Crane compelled the ironmasters of Great Britain to pay him tribute.

On the 1st of January, 1876, there were 225 anthracite furnaces in this country, which produced, in 1875, 908,046 net tons of pig iron. But only a portion of them were then in blast.

Pig iron manufactured from bituminous coke is claimed to have been first made as a regular product in the United States by F. H. Oliphant, at Fairchance furnace, near Uniontown, Fayette county, Pennsylvania, in 1836. But William Firmstone was successful in 1835 in making good gray forge iron for about one month at the end of a blast at Mary Ann furnace, in Trough Creek valley, Tod township, Huntingdon county, Pennsylvania, from coke made from

Broad Top coal. This iron was taken to a forge two miles distant and made into blooms. Mr. Oliphant sent to the Franklin Institute of Philadelphia samples of the metal produced and of the various materials used at his furnace.

The Legislature of Pennsylvania passed an act June 16, 1836, "to encourage the manufacture of iron with coke or mineral coal," which authorized the organization of companies for the manufacture, transportation, and sale of iron made with coke or coal. During the years 1835-6-7 furnaces were erected at Karthaus and Farrandsville, on the west branch of the Susquehanna river, and at Frozen run, near the Lycoming creek, to use coke, but the experiment was unfortunate in each instance. At Karthaus several hundred tons in all of white iron were produced at irregular intervals. This furnace was built in 1836 by Peter Ritner (a brother of Governor Ritner) and John Say, and it ran spasmodically upon coke with cold blast until 1838. In 1839 Henry C. Carey, Burd Patterson, and others, constituting the Clearfield Coal and Iron Company, employed William Firmstone to take charge of the furnace. He put in a hot blast and raised the stack, and made several hundred tons of good foundry iron by the close of the year, when the whole enterprise was abandoned owing to the lack of proper transportation facilities. At Farrandsville, as we are informed by General Daniel Tyler, 3,500 tons of iron were made, but at such great cost, owing to the impurity of the coal and the distance of the ore, that further efforts to make iron with coke were abandoned. The furnace was blown in, according to General Tyler, in the summer of 1837, and ran probably until 1839. It was fitted up with a hot-blast apparatus, made in Glasgow, and the best known at that time in Scotland. The furnace at Frozen run made some iron from coke, but how much is not stated. In September, 1839, it was using charcoal. Lonaconing furnace, in Alleghany county, Maryland, was built in 1837 to use coke, and in June, 1839, it was making about 70 tons per week of good foundry iron. In the Frostburg coal basin of Maryland, nine miles northwest of Cumberland, two large blast furnaces were built in 1840, by the Mount Savage Company, to use coke. This enterprise was also successful. But the use of coke did not come rapidly into favor, and many experiments with it were attended with loss. R. C. Taylor, in his *Statistics of Coal*, states that, "between the years 1840 and 1844 five blast furnaces and two rolling-mills were erected in Maryland and Pennsylvania to use

bituminous coal after the method of the English works"—that is, by coking. In 1849 there were only four furnaces in Pennsylvania which were classed as coke furnaces—those of the Brady's Bend Iron Company, and they made no iron in that year. In 1854, so slowly had the whole country progressed in the manufacture of pig iron from raw bituminous coal and coke, that the total production from these two kinds of fuel in that year was only 54,485 net tons, Pennsylvania making 29,941 tons; Ohio, 15,000 tons; and other States, 9,544 tons. In 1875 the make of bituminous coal and coke pig iron in the whole country exceeded that of anthracite, and was more than double that of charcoal. In that year the production of pig iron was as follows: bituminous coal and coke, 947,545 net tons; anthracite, 908,046 tons; charcoal, 410,990 tons.

The bituminous coal of Eastern Ohio and Western Pennsylvania was the first that was used in this country in its raw state for the reduction of iron ore in the blast furnace. The history of the beginning of this branch of our iron industry is circumstantially and we believe correctly stated in the following extract from a pamphlet entitled *Youngstown, Past and Present*, published in 1875.

In July, 1845, Himrod & Vincent, of Mercer county, Pa., blew in the Clay furnace, not many miles from the Ohio line, on the waters of the Shenango. About three months afterwards, in consequence of a short supply of charcoal, as stated by Mr. Davis, their founder, a portion of coke was used to charge the furnace. Their coal belongs to seam No. 1, the seam which is now used at Sharon and Youngstown, in its raw state, variously known as "free-burning splint," or "block coal," and which never makes solid coke. A difficulty soon occurred with the cokers, and, as Mr. Himrod states, he conceived the plan of trying his coal without coking. The furnace continued to work well, and to produce a fair quality of metal. At the same time Messrs. Wilkinson, Wilkes & Co. were building a furnace on the Mahoning, at Lowell, Mahoning county, Ohio, intending to use mineral coal from seam No. 1, on which they owned a mine near Lowell. The credit of making the first iron with raw bituminous or semi-bituminous coal, in the United States, belongs to one of these firms. An account of the blowing in of the Lowell furnace, on the 8th of August, 1846, may be seen in the *Trumbull Democrat*, of Warren, dated August 15, 1846, where it is stated that to "these gentlemen (Wilkinson, Wilkes & Co.) belongs the honor of being the first persons in the United States who have succeeded in putting a furnace in blast with raw bituminous coal." According to Mr. Wilkes, writing from Painesville, April 2, 1869, this furnace was run with coke several months, but at what time it does not state. It is admitted that Mr. David Himrod, late of Youngstown, produced the first metal, with raw coal, about the close of the year 1845, and has continued to use it ever since. The friends of Wilkinson & Co. claim that it was an accident, and a necessity, while their works were built and intended for raw coal.

In 1850 there were only four furnaces in the Mahoning valley, and only seven in Pennsylvania (all in Mercer county) which used raw bituminous coal. In 1875 there were 207 furnaces in the whole country using either raw or coked bituminous coal when in blast.

We learn from A. P. Swineford's *History of the Lake Superior Iron District* that the existence of iron ore of a superior quality on the border of Lake Superior, in the upper peninsula of Michigan, was known to white traders with the Indians as early as 1830. In 1845 nearly a ton of the ore from the since-celebrated Jackson mountain was taken to Detroit, from which a small quantity was taken to an old forge at Coldwater, Michigan, where the first iron from Lake Superior ore was made, in the form of a small bar. In that year the Jackson Mining Company was organized, and in 1846 it commenced operations. In this year the company built a forge on the Carp river, which first made blooms in 1848 from ore mined at the Jackson mine. The first bloom was made on the 10th day of February, 1848, and hammered into bar iron. Some of the first blooms were sold to Captain E. B. Ward, and from them was made the walking-beam of the steamboat "Ocean." The forge was kept in operation until 1854, when it was abandoned. Three other forges were built after the Carp forge, at one of which, the Collins forge, pig iron was made by S. R. Gay as an experiment, the forge chimney being temporarily converted into a stack. Not much progress in mining was made by the Jackson Iron Company until after the completion in 1855 of their docks at Marquette. In 1853 three or four tons of the ore were shipped to the World's Fair at New York, but regular shipments did not begin until 1856, in which year 7,000 tons were shipped. In 1873 the shipments from the mines to furnaces in Michigan and elsewhere aggregated 1,167,379 tons. Over 8,000,000 tons of ore have been produced since the first mine was opened. The first blast furnace in the district was the Pioneer No. 1, which was blown in in April, 1858. The Collins furnace was also built in 1858, and made its first iron on the 13th day of December of that year. Pioneer No. 2 was blown in May 29, 1859. There are now twenty-four furnaces and a rolling-mill in the Lake Superior district, and in all Michigan there are thirty-four furnaces and three rolling-mills. The manufacture of iron in Southern Michigan can not be said to have had an existence prior to the development of the Lake Superior region, the forge at Coldwater being the only anterior enterprise of which there seems to be any record.

The development of the Brazil block-coal district, in the vicinity of Terre Haute, in the western part of Indiana, and the adaptation of this valuable fuel to the manufacture of iron, properly dates from 1867, when the first bituminous furnace was built in the district. Prior to 1860, Indiana produced a small quantity of charcoal iron, but from that time until 1867 no pig iron of any kind was produced in the State. Planet furnace, at Harmony, Clay county, owned by the Indianapolis Rolling Mill Company, was built in the summer of 1867, and blown in in November. In the same year the Western Iron Company built a furnace at Knightsville, in Clay county, which was blown in that fall, a few weeks after the blowing in of the Planet; and in 1868 they built at the same place a second stack, which was blown in in December. The Brazil furnace, in Clay county, was built by Garlick & Collins in 1867, and blown in on the 8th of December. Lafayette furnace, near Brazil, owned by the Lafayette Iron Company, was built in 1868-9, and blown in on the 20th of May, 1869. At Terre Haute two stacks were built in 1870 and 1872 by the Vigo Iron Company. A furnace has also been commenced at Worthington by the Greene County Iron Works Company. All these furnaces were built to smelt Lake Superior and Missouri ores with block coal, the reduction of these hard ores being facilitated by the admixture of a liberal percentage of native limonites and hematites. In the seven stacks which have been in operation, as well as in some rolling-mills of the State, the results with this coal have been most satisfactory. A furnace at Shoals, in Martin county, was built in 1872 to use block coal, and did use it for some time, but is now using charcoal. A small furnace was also built at Knightsville in 1875, by the Runser Iron Company, to use slag from neighboring furnaces. Indiana has ten rolling-mills in 1876. The first furnace in the State was probably Mishawaka furnace, in St. Joseph county, built about 1833, to use bog ore.

Illinois, like Indiana, made a small quantity of charcoal pig iron prior to 1860. From that year until 1868 there was not an active furnace in the State. Since that year eleven large furnaces have been built to use bituminous coal and coke, much of which is obtained within the State. Four of these furnaces are at Chicago, two opposite St. Louis, two at Joliet, and three in the Grand Tower coal section of the State. There is still another furnace—the Illinois furnace at Elizabethtown, Hardin county—said to be the oldest in the State. It once used charcoal, but was repaired and altered in 1873 to use coal or coke. Illinois in 1876 has nine rolling-mills,

and one building. Of these, three make Bessemer rails. The rail product of the State in 1875 was only exceeded by that of Pennsylvania. The first rolling-mill in Illinois was built at Chicago in 1857 by Captain E. B. Ward, and was called the Chicago rolling-mill, now known as the North Chicago rolling-mill.

The manufacture of iron in Wisconsin was commenced about 1853, when a charcoal furnace was in operation at Mayville, Dodge county. Another was built at Baraboo, Sauk county, and another at Black River Falls, German county, about 1856. A second stack at Mayville was built about 1857. In 1876 Wisconsin has fourteen completed furnaces and one building, two of which are of large size and use anthracite coal and coke. The others use charcoal. It has also one of the largest and most complete rolling-mills in the United States.

Missouri, now one of the leading iron-producing States of the Union, certainly made iron at a very early period in its history. The earliest authentic mention of any ironworks within its limits which we have been able to find is that of the old Maramec furnace, in Phelps county, said to have been built in 1826. A forge was in operation in Crawford county in 1847; another in Iron county in 1849; and another in St. Francois county in 1852. The first Iron Mountain furnace was built in 1846; a second was built in 1850; and a third in 1854. Pilot Knob furnace was built in 1848. All these were charcoal furnaces. The Mosele furnace, also charcoal, was built in 1867. Since 1867 the whole number of furnaces in Missouri has been increased to nineteen, of which eight are very large stacks and use bituminous coal and coke, and eleven use charcoal. The State has six important rolling-mills in 1876, one of which embraces machinery for the manufacture of Bessemer steel. The first rolling-mill in Missouri is believed to have been the St. Louis (now Laclede) rolling-mill, at St. Louis, built in 1850. The shipments of iron ore to points outside of the State have for many years been large. In 1873 they aggregated 177,044 tons, and in 1874, 108,400 tons.

Arkansas is not known to have any ironworks within her borders in 1876, but in 1857 a bloomary with two fires and a hammer was in successful operation in Lawrence county.

Forges in Habersham, Dade, and other counties in Georgia were built as long ago as 1830, and probably much earlier. The first furnace in Georgia of which we have any account was Sequeee furnace, built prior to 1832, near Clarksville, in Habersham county,

and abandoned in 1837. Several were built in Cass county between 1842 and 1856, and one in Walker county about 1852. Etowah furnace, in Cass county, was built in 1837, abandoned in 1844, and torn down in 1850. A new furnace, built by its side in 1844, is now in ruins. All these were charcoal furnaces. After 1870 several furnaces were built in Dade, Bartow, and Polk counties, nine of which now use charcoal when in blast, and three use coke. Of the coke furnaces, Rising Fawn, in Dade county, is sixty feet high by sixteen feet wide at the boshes, and was the first furnace in the United States to use the Whitwell hot-blast stove, blowing in for the first time June 18, 1875. Georgia has two rolling-mills in 1876.

Alabama had a forge two and a half miles southwest of Montevallo, in Shelby county, in 1825; several in Bibb county between 1830 and 1840; two in Benton county in 1843; one in Talladega county in 1842; and others at later periods. The first furnace in the State was built in 1818, a few miles west of Russellville, in Franklin county, and abandoned in 1827. A furnace was built at Polkville, in Benton county, in 1843; one at Round Mountain, in Cherokee county, in 1852; and one at Shelby, in Shelby county, in 1849. In 1876 Alabama has fourteen completed furnaces and one building, all built to use charcoal. At Woodstock furnace, in Calhoun county, spiegeleisen of good quality is now made. The State has but one rolling-mill in 1876, located at Helena, Shelby county: it makes cotton-ties a specialty. The existence of bituminous coal in Alabama was first observed in 1834, by Dr. Alexander Jones, of Mobile.

In 1855 Lesley enumerated over seventy-five bloomaries and forges, seventy-one furnaces, and four rolling-mills, in Tennessee, each of which had been in operation at some period after 1800. Of the furnaces, twenty-nine were in East Tennessee, and forty-two in Middle and West Tennessee. Of the latter, fourteen were in Stewart county, twelve in Montgomery, seven in Dickson, two in Hickman, two in Perry, two in Decatur, two in Wayne, and one in Hardin. The furnaces in East Tennessee were mainly in Sullivan and Carter counties. All the furnaces enumerated used charcoal. Most of these furnaces and forges have long been abandoned. There are still remaining eighteen charcoal and four bituminous furnaces; also four rolling-mills, and one building, and a few bloomaries and forges. Cumberland rolling-mill, on the left bank of the Cumberland river, in Stewart county, was built in 1829, and was probably the first rolling-mill in the State.

The same authority enumerates no less than ninety-five furnaces and sixty forges as having been built in Virginia prior to 1857; also eleven rolling-mills. Several of these were within the limits of the present State of West Virginia. The first rolling-mill in the now active iron-manufacturing city of Wheeling appears to have been built in 1832. It was named the Wheeling rolling-mill, and was burned down and rebuilt in 1854, when its name was changed to Missouri. There are now eight rolling-mills, twelve furnaces, and a bloomery in West Virginia; and in Virginia there are thirty-four furnaces, four rolling-mills, and seven bloomeries. The Tredegar ironworks, at Richmond, have long been celebrated for their large capacity and the variety of their products.

Twenty years ago Lesley enumerated about fifty forges in North Carolina, most of which were then in operation; also six furnaces and two rolling-mills. In 1876 there are not a dozen active forges and bloomeries in the State, and of eight furnaces which are classed in the active list only one was in operation in 1875. There is not a rolling-mill in operation in the State, nor a manufactory of steel. There seems to be no good reason why this backward step should ever have been taken.

The discovery, in 1839 and 1840, that anthracite coal could be successfully used in the manufacture of pig iron gave a great impetus to the iron industry in Maryland, New Jersey, and New York, as well as in Pennsylvania; in all of which States the manufacture of pig iron and the various forms of rolled iron has since become a prominent and leading industry of their people, and so well known to all the world that further notice of its magnitude would be superfluous. The rich magnetic ores of New Jersey were first smelted with anthracite coal by Edwin Post, Esq., at Stanhope, in 1840.

The forges of the Lake Champlain district of New York, which make iron direct from the ore, of a quality that fairly competes with the best Swedish iron in the manufacture of steel, now number twenty-seven. Many of them are large and well appointed, possessing all the modern improvements that can be adapted to this primitive process. The steel works of the country are the principal consumers of the products of these forges. In 1810 Essex county, New York, had fifteen small bloomery forges for making bar iron. Richard and Oliver Keese and John W. Anderson erected extensive ironworks this year on the Au Sable creek at Keeseville.

There are 39 bloomeries in Pennsylvania in 1876 which refine pig and scrap iron into blooms, principally for sheet and boiler plate.

In 1876 there are two rolling-mills in Kansas, one at Rosedale and the other at Topeka, both of which reroll rails. Minnesota has one completed furnace stack, at Duluth, which has not yet been in operation. In Utah Territory there are two furnaces: one at Iron City, which was running in 1875 on charcoal, and another, not quite finished, at Ogden, which is to use bituminous coal. At Laramie City, in Wyoming Territory, is a rolling-mill for rerolling rails. At San Francisco, California, is a rolling-mill of large capacity, which rerolls rails as part of its regular product. At Oswego, in Clackamas county, Oregon, is a charcoal furnace, built in 1866, and running in 1875. About ten years ago three charcoal furnaces in Northeastern Texas, which had once been active, were abandoned; but in 1874 a charcoal furnace was in operation at Jefferson, in Marion county, Texas.

In New England in 1876 there are nineteen blast furnaces and thirty-five rolling-mills. At four of the rolling-mills steel is also made. In addition to these four establishments, there are four independent steel works. In 1876 there are only two forges and one bloomary in New England.

Although it long ago ceased to make pig iron, Delaware is prominent in the manufacture of finished iron. It has eight completed rolling-mills and one building; it also manufactures car-wheels and machinery largely, and has two extensive iron shipyards.

The manufacture of crucible and other steel in this country has received an immense impetus since 1860. In 1850 there were only five steel-making establishments in the country, and in 1860 there were only thirteen, while in 1870 there were thirty. In 1876, omitting Bessemer works, there are sixty steel works in the United States, of which thirty-eight make crucible cast steel, and the remainder make puddled steel, open-hearth steel, or steel from steel scrap. Of the thirty-eight which make crucible steel, seven also make German and blister steel.

Many years elapsed after the first railroad was built in this country before iron rails for railway tracks were made in American rolling-mills. Among the proposals to furnish railroad iron for the Columbia and Philadelphia Railroad, received in May, 1831, there were none for American iron, and the whole quantity was purchased in England. In 1844 the manufacture of iron rails was commenced in this country at the Mount Savage rolling-mill, in Alleghany county, Maryland, erected between 1841 and 1843 especially for rolling rails. The Montour rolling-mill, at Danville, Pa., was

built in 1845 expressly to roll rails, and here we believe were rolled in that year the first **T** rails made in the country. In 1845 the rolling-mill of Cooper & Hewitt was built at Trenton, N. J., to roll rails, and on the 19th of June, 1846, their first rail was rolled. Rails were also rolled later in 1846 at Phoenixville, Pa.; in 1847 at the Rough and Ready rolling-mill at Danville, Pa.; in 1848 at Safe Harbor, Pa.; and in 1848 or 1849 at Brady's Bend, Pa. Other mills rolled rails before 1850. Below will be found two interesting letters we have received from two of the oldest iron-masters in the United States, in which their recollection of the early history of rail-making in this country is given with great clearness.

MOUNT SAVAGE, Md., June 20, 1876.

MY DEAR SIR: I am in receipt of your favor. The Mount Savage rail mill for rolling heavy **T** or **U** rails was built during the year 1843. It was designed for a heavy rail mill from the beginning, and no merchant iron was ever made in it for market, but only for home consumption. Mr. William Young, before of the Ulster Iron Company, Saugerties, New York, was then president of the Maryland and New York Iron and Coal Company, operating at Mount Savage, and the mill manager was Mr. Simmons, from Saugerties, likewise. The first rail rolled (and for which the Franklin Institute of Philadelphia struck a silver medal) was in 1844, and was a **U** rail, known in Wales as the Evans patent, of Dowlais ironworks, Merthyr Tydvil. It was intended to be laid on a wooden longitudinal sill, and was fastened to it by an iron wedge, keying under the sill, thus doing away with outside fastenings. This rail weighed 42 lbs. to the yard, and about 500 tons of it were laid in 1844 on part of the road then building between Mount Savage and Cumberland, a distance of nine miles. It was understood at the time to be the first heavy railroad iron made in America. The locomotive which operated this road on a grade of 100 feet to the mile was one belonging to the Baltimore and Ohio Railroad, named the "Vulcan," weighing under fifteen tons, but then considered a heavy engine. The next rail, and made at about the same time, was a 52-lb. rail for the road leading out of Fall River toward Boston. I will mention here that in the previous year 1843 the writer and a companion, Mr. Howell, discovered and introduced the peculiar fire-clay (making the now so well known Mount Savage firebrick) which underlies the coal measures of this basin. The puddling and heating furnaces of the rolling-mill were all built from this clay, but sample brick had been sent to various establishments to be tested, among other persons to Mr. Crocker, of Taunton, Mass., who pronounced it of equal quality with the best English Stourbridge, then largely used. I think that this gives you the desired information.

Truly, Yours,

HENRY THOS. WELD.



PHENIXVILLE, Pa., July 3, 1876.

DEAR SIR: As you are no doubt aware, previous to the passage of the tariff act of 1842 rails were admitted to this country duty free. On the passage of that act parties in this country began to think about making rails. My recollection is that the first rails made in this country were made in 1843 at the Mount Savage ironworks, that being at the time the only mill in the country having the proper trains. Whether the first rails made at Mount Savage were **T** or **U** rails I am unable to say. Immediately following the successful making of rails at Mount Savage, the rail mill at Danville was commenced by the Montour Iron Company, and was making rails, I think, in the latter part of 1844, but probably not till 1845. In 1846 the rail mill at Phoenixville and also the one at Trenton were built and put in operation, followed by one at Safe Harbor, which made rails in 1848.

The ironworks at Brady's Bend were originally started to make merchant bar iron. About the year 1848, possibly not before 1849, these works were changed to roll rails, their iron being unsuited to bar iron.

Respectfully, Yours,

JOHN GRIFFEN.

The first **T** rails imported into this country were made to be fitted into cast-iron chairs, which rested upon stone blocks, but in a few years wooden cross-ties were used instead of the blocks. A thin wedge or key of wrought iron was driven between the inside of the chair and the rail to keep the latter firmly in its place, and the operation of "driving keys" had to be repeated almost every day, owing to the tendency



of moving trains to loosen them. Rails of this pattern were used for many years upon the Allegheny Portage Railroad in Pennsylvania, and many of the stone blocks could lately be seen in its abandoned bed. Rails made with the broad base now found in all **T** rails were first made in England about 1833 for the Camden and Amboy Railroad of New Jersey, and the innovation is said to have been the result of a futile effort to roll a rail and chair in one piece. It seems strange that this form of rail should not have become generally popular in this country until about 1845.

The origin of the pneumatic process for converting pig iron into steel, through which a complete revolution in the manufacture of iron has already been effected, is scarcely twenty years old, although experiments looking to this result were commenced about twenty-five years ago. The first person to suggest and to experiment upon the blowing of air into and through molten crude iron in a crucible or vessel without the use of fuel to retain the metal in the molten condition is believed to have been William Kelly, an ironmaster of

Eddyville, Kentucky, who began a series of experiments based upon this theory as early as 1851, a theory or principle which he subsequently patented. Henry Bessemer, of England, whose name has been given to the pneumatic process, secured his first patents for the manufacture of steel in 1855, but he did not announce his discovery of the pneumatic process until February 12, 1856, when it was patented. But neither Mr. Kelly nor Mr. Bessemer was successful in making steel by the method each had respectively adopted. Improvements were made upon Mr. Bessemer's method by Robert Mushet, of Cheltenham, England, and by Göran Göransson, of Sweden. As a result of the joint improvements of these two gentlemen, Mr. Göransson succeeded in 1858 in producing from his converter "the first really satisfactory product ever made directly by the pneumatic or Bessemer process."

Mr. Mushet's improvement (the use of spiegeleisen as an alloy) was patented in this country by licensees of the Kelly patents, while the control in this country of Mr. Bessemer's original process, with all his machinery necessary to its application, was obtained by a company of other American ironmasters. As the licensees of the Kelly patents could not achieve success without Mr. Bessemer's machinery, and as the owners of the right to use this machinery could not make steel without Mr. Mushet's improvement, an arrangement was effected by which all the patents were consolidated.

The first Bessemer steel rails ever rolled in this country were rolled at the North Chicago rolling-mill on the 24th day of May, 1865, from hammered blooms made at the Wyandotte rolling-mill from ingots of steel made at the Experimental steel works at Wyandotte. The American Iron and Steel Association was in session at Chicago at the time, and several of its members witnessed the rolling of these rails. One of the rails was taken to the hall occupied by the Association, and exhibited, and subsequently was placed on exhibition in the lobby of the Tremont House. The Experimental steel works, at Wyandotte, were erected in 1864, and were the first works started in this country for conducting the pneumatic or Bessemer process. The rolls upon which the blooms were rolled at the North Chicago rolling-mill were those which had been in use for rolling iron rails, and, though the reduction was quite too rapid for steel, the rails came out sound and well shaped. Several of these rails were laid in the track of one of the railroads running out of Chicago, and are still in use. The first steel rails rolled in the United States upon order, in the way of regular business, were rolled

by the Cambria Iron Company, at Johnstown, Pa., in August, 1867, from ingots made at the works of the Pennsylvania Steel Company, at Harrisburg, Pa., and by the Spuyten Duyvil Rolling Mill Company, at Spuyten Duyvil, N. Y., early in September of that year, from ingots made at the Bessemer steel works, at Troy, N. Y., then owned by Messrs. Winslow & Griswold.

Further details of the development of our iron industry in the first seventy-five years of the nineteenth century are deemed unnecessary. The number, location, capacity, character, and ownership of every iron and steel establishment existing in each State on the 1st day of January, 1876, have already been given to the public in the *Directory to the Ironworks of the United States*, published by the American Iron and Steel Association, and to this volume the reader is respectfully referred. The leading facts set forth in the Directory may properly, however, be recapitulated here.

Whole number of Blast Furnaces, excluding abandoned furnaces, Jan. 1, 1876.....	713
Annual capacity of all the 713 Furnaces, in net tons.....	5,439,230
Whole number of Rolling-Mills, Jan. 1, 1876.....	332
Whole number of Single Puddling Furnaces (double furnaces counting as two)...	4,475
Total annual capacity of all Rolling-Mills in finished iron, net tons.....	4,189,760
Annual capacity of all the Rail Mills in heavy rails, net tons.....	1,940,300
Number of Bessemer Steel Works, Jan. 1, 1876 (one of which is building).....	11
Annual capacity in ingots, net tons.....	500,000
Number of Bessemer Converters.....	24
Number of Open-Hearth Steel Works, Jan. 1, 1876.....	16
Number of Open-Hearth Furnaces.....	22
Annual capacity in ingots, net tons.....	45,000
Number of Crucible, German, blister, and puddled Steel Works, Jan. 1, 1876.....	39
Annual capacity of Merchantable Steel, net tons.....	108,250
Of which there are of Crucible Steel, in net tons.....	45,000
Number of Forges making blooms direct from the ore, Jan. 1, 1876.....	39
Annual capacity in blooms and billets, net tons.....	59,450
Number of Bloomaries, Jan. 1, 1876, making blooms from pig iron.....	59
Annual capacity in blooms, net tons.....	60,200

RATES OF DUTY ON FOREIGN IRON FROM 1789 TO 1876.

The following are the rates of duty which have been imposed on foreign iron by the various tariff acts of our government since the first act was framed in 1789. In the preparation of this schedule we have had the assistance of Hon. Lorin Blodget, United States Appraiser-at-Large.

Pig Iron: 1789, 5 per cent. on the home value, less 10 per cent. in American vessels; 1791, 5 per cent. on the home value, plus 10 per cent. in foreign vessels; 1792, 10 per cent. on the home value in American vessels, and 11 per cent. in foreign vessels; 1794, 15 per cent. on home value in American vessels, and 16½ per cent. in foreign vessels; 1795, 15 per cent. on foreign value in American vessels, and 16½ per cent. in foreign vessels; 1804, 17½ per cent. on

foreign value in American vessels, and $19\frac{1}{2}$ per cent. in foreign vessels; 1812, $32\frac{1}{2}$ per cent. on foreign value in American vessels, and 37.4 per cent. in foreign vessels; 1816, 20 per cent. on foreign value in American vessels, plus 10 per cent., and 22 per cent. in foreign vessels, plus 10 per cent.; 1818, 50 cents per cwt.; 1828, $62\frac{1}{2}$ cents per cwt.; 1832, 50 cents per cwt.; 1833 to 1842, gradual abatement to 20 per cent. *ad valorem*; 1842, \$9 per ton; 1846, 30 per cent. *ad valorem*; 1857, 24 per cent.; 1861, \$6 per ton; 1864, \$9 per ton; 1870, \$7 per ton; 1872, \$6.30 per ton; 1875, \$7 per ton. Includes spiegeleisen.

Bar Iron: 1789, "hammered," 5 per cent. on the home value, less 10 per cent. in American vessels, and "slit and rolled," $7\frac{1}{2}$ per cent. on the home value, less 10 per cent. in American vessels; 1791, "hammered," 5 per cent. on the home value, plus 10 per cent. in foreign vessels, and "slit and rolled," $7\frac{1}{2}$ per cent. on the home value, plus 10 per cent. in foreign vessels; 1792 to 1816, duty the same as that on pig iron, except "slit and hoop iron," which paid 1 cent per pound from 1804 to 1812, and 2 cents per pound from 1812 to 1816, in American vessels, and $1\frac{1}{10}$ cents per pound from 1804 to 1812, and $2\frac{3}{10}$ cents per pound from 1812 to 1816, in foreign vessels; 1816, from 45 cents to \$2.50 per cwt.; 1818, from 75 cents to \$2.50 per cwt.; 1824, from 90 cents to \$3.36 per cwt.; 1828, from \$1.12 to \$3.92 per cwt.; 1833, from 90 cents to \$3.36 per cwt.; from 1833 to 1842, gradual abatement to 20 per cent. *ad valorem*; 1842, from \$17 to \$56 per ton; 1846, 30 per cent. *ad valorem*; 1857, 24 per cent. *ad valorem*; 1861, from \$15 to \$20 per ton; 1862, from \$17 to \$25 per ton; April 30, 1864, from \$25.50 to \$37.50 per ton; July 1, 1864, from \$22.40 to \$39.20 per ton; 1872, from \$20.16 to \$35.28 per ton; 1875, from \$22.40 to \$39.20 per ton.

Railroad Bars: 1828, \$37 per ton; 1830, 25 per cent. *ad valorem*; 1832, free; 1843, \$25 per ton; 1846, 30 per cent. *ad valorem*; 1857, 24 per cent. *ad valorem*; 1861, \$12 per ton; 1862, \$13.50 per ton; April 30, 1864, \$20.25 per ton; July 1, 1864, \$13.44 per ton; 1865, \$15.68 per ton; 1872, \$14.11 $\frac{2}{10}$ per ton; 1875, \$15.68 per ton.

Steel Rails: 1864, 45 per cent. *ad valorem*; 1871, \$28 per ton; 1873, \$25.20 per ton; 1875, \$28 per ton. *Rails made partly of Steel*: 1864, 45 per cent. *ad valorem*; 1871, \$22.40 per ton; 1872, \$20.16 per ton; 1875, \$22.40 per ton.

Steel: 1789, 50.4 cents per cwt. in American vessels, and 56 cents in foreign vessels; 1790, 75 cents per cwt. in American and 82.5 cents in foreign vessels; 1792, \$1 per cwt. in American and $1.07\frac{1}{2}$ in foreign vessels; 1795, \$1 per cwt. in American and \$1.10 in foreign vessels; 1812, \$2 per cwt. in American and \$2.31 in foreign vessels; 1816, \$1 per cwt. in American and \$1.10 in foreign vessels; 1828, \$1.50 per cwt.; 1842, \$1.50 and \$2.50 per cwt.; 1846, 30 per cent. *ad valorem*; 1857, 24 per cent. *ad valorem*; 1861, from $1\frac{1}{2}$ to 2 cents per lb., when valued under 11 cents per lb., and when valued over 11 cents per lb. 20 per cent. *ad valorem*; 1862, under 11 cents, from $1\frac{1}{2}$ to $2\frac{1}{2}$ cents per lb., and over 11 cents, 25 per cent. *ad valorem*; 1864, under 11 cents, from $2\frac{1}{2}$ to 3 cents per lb., and over 11 cents, $3\frac{1}{2}$ cents per lb. and 10 per cent. *ad valorem*; 1872, 10 per cent. less than in 1864; 1875, under 11 cents, from $2\frac{1}{2}$ to 3 cents per lb., and over 11 cents, $3\frac{1}{2}$ cents per lb. and 10 per cent. *ad valorem*. Includes Bessemer and Siemens-Martin steel.

TARIFF OF DUTIES ON IRON AND STEEL AND MANUFACTURES THEREOF, IMPOSED BY THE UNITED STATES IN 1876.

Iron in pigs, \$7 per ton. [Includes spiegeleisen.]

Bar iron, rolled or hammered, comprising flats not less than 1 inch or more than 6 inches wide, nor less than $\frac{3}{8}$ of an inch or more than 2 inches thick; rounds not less than $\frac{3}{8}$ of an inch nor more than 2 inches in diameter; and squares not less than $\frac{3}{8}$ of an inch nor more than 2 inches square, 1 cent per pound. Bar iron, rolled or hammered, comprising flats less than $\frac{3}{8}$ of an inch or more than 2 inches thick, or less than 1 inch or more than 6 inches wide; rounds less than $\frac{3}{8}$ of an inch or more than 2 inches in diameter; and squares less than $\frac{3}{8}$ of an inch or more than 2 inches square, $1\frac{1}{2}$ cents per pound. But all iron in slabs, blooms, loops, or other forms, less finished than iron in bars, and more advanced than pig iron, except castings, shall be rated as iron in bars, and pay a duty accordingly; and none of the above iron shall pay a less rate of duty than 35 per centum *ad valorem*.

Moisie iron, made from sand ore by one process, \$15 per ton.

Iron bars for railroads or inclined planes, 70 cents per 100 pounds.

Boiler or other plate iron not less than $\frac{3}{8}$ of an inch in thickness, $1\frac{1}{2}$ cents per pound.

Boiler and other plate iron, not otherwise provided for, \$25 per ton.

Iron wire, bright, coppered, or tinned, drawn and finished, not more than $\frac{1}{4}$ of an inch in diameter, not less than number 16, wire-gauge, \$2 per 100 pounds, and in addition thereto 15 per centum *ad valorem*; over number 16 and not over number 25, wire-gauge, \$3.50 per 100 pounds, and in addition thereto 15 per centum *ad valorem*; over or finer than number 25, wire-gauge, \$4 per 100 pounds, and in addition thereto 15 per centum *ad valorem*. But wire covered with cotton, silk, or other material shall pay 5 cents per pound in addition to the foregoing rates.

Round iron in coils, $\frac{3}{8}$ of an inch or less in diameter, whether coated with metal or not so coated, and all descriptions of iron wire, and wire of which iron is a component part, not otherwise specifically enumerated and provided for, shall pay the same duty as iron wire, bright, coppered, or tinned.

Wire spiral furniture springs, manufactured of iron wire, 2 cents per pound and 15 per centum *ad valorem*.

Smooth or polished sheet iron, by whatever name designated, 3 cents per pound.

Sheet iron, common or black, not thinner than number 20, wire-gauge, $1\frac{1}{2}$ cents per pound; thinner than number 20 and not thinner than number 25, wire-gauge, $1\frac{1}{2}$ cents per pound; thinner than number 25, wire-gauge, $1\frac{1}{2}$ cents per pound.

All band, hoop, and scroll iron from $\frac{1}{4}$ to 6 inches in width, not thinner than $\frac{1}{8}$ of an inch, $1\frac{1}{2}$ cents per pound.

All band, hoop, and scroll iron from $\frac{1}{4}$ to 6 inches wide under $\frac{1}{8}$ of an inch in thickness, and not thinner than number 20, wire-gauge, $1\frac{1}{2}$ cents per pound.

All band, hoop, and scroll iron thinner than number 20, wire-gauge, $1\frac{1}{2}$ cents per pound.

Slit rods, $1\frac{1}{2}$ cents per pound.

All other descriptions of rolled or hammered iron not otherwise provided for, $1\frac{1}{2}$ cents per pound.

All hand-saws not over 24 inches in length, 75 cents per dozen, and in addition thereto 30 per centum *ad valorem*; over 24 inches in length, \$1 per dozen, and in addition thereto 30 per centum *ad valorem*.

All back-saws not over 10 inches in length, 75 cents per dozen, and in addition thereto 30 per centum *ad valorem*; over 10 inches in length, \$1 per dozen, and in addition thereto 30 per centum *ad valorem*.

Files, file-blanks, rasps, and floats of all descriptions, not exceeding 10 inches in length, 10 cents per pound, and in addition thereto 30 per centum *ad valorem*; exceeding 10 inches in length, 6 cents per pound, and in addition thereto 30 per centum *ad valorem*.

Penknives, jack-knives, and pocket-knives of all kinds, 50 per centum *ad valorem*.

Sword-blades, 35 per centum *ad valorem*.

Swords, 45 per centum *ad valorem*.

Needles for knitting or sewing machines, \$1 per 1,000, and in addition thereto 35 per centum *ad valorem*.

Iron squares marked on one side, 3 cents per pound, and in addition thereto 30 per centum *ad valorem*; all other squares of iron or steel, 6 cents per pound, and 30 per centum *ad valorem*.

All manufactures of steel, or of which steel shall be a component part, not otherwise provided for, 45 per centum *ad valorem*. But all articles of steel partially manufactured, or of which steel shall be a component part, not otherwise provided for, shall pay the same rate of duty as if wholly manufactured.

Steel railway bars, $1\frac{1}{2}$ cents per pound.

Railway bars made in part of steel, 1 cent per pound. And metal converted, cast, or made from iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as steel. [Includes Siemens-Martin steel.]

Locomotive-tire, or parts thereof, 3 cents per pound.

Mill-irons and mill-cranks of wrought iron, and wrought iron for ships, steam-engines, and locomotives, or parts thereof, weighing each 25 pounds or more, 2 cents per pound.

Anvils and iron cables, or cable chains, or parts thereof, $2\frac{1}{2}$ cents per pound: *Provided*, That no chains made of wire or rods of a diameter less than $\frac{1}{2}$ of an inch shall be considered a chain cable.

Chains, trace-chains, halter-chains, and fence-chains, made of wire or rods, not less than $\frac{1}{2}$ of an inch in diameter, $2\frac{1}{2}$ cents per pound; less than $\frac{1}{2}$ of an inch in diameter, and not under number 9, wire-gauge, 3 cents per pound; under number 9, wire-gauge, 35 per centum *ad valorem*.

Anchors, or parts thereof, $2\frac{1}{2}$ cents per pound.

Blacksmiths' hammers and sledges, axles, or parts thereof, and malleable iron in castings, not otherwise provided for, $2\frac{1}{2}$ cents per pound.

Wrought-iron railroad-chairs, and wrought-iron nuts and washers, ready punched, 2 cents per pound.

Bed-screws and wrought-iron hinges, $2\frac{1}{2}$ cents per pound.

Wrought board-nails, spikes, rivets, and bolts, $2\frac{1}{2}$ cents per pound.

Steam, gas, and water tubes and flues of wrought iron, $3\frac{1}{2}$ cents per pound.

Cut nails and spikes, $1\frac{1}{2}$ cents per pound.

Horse-shoe nails, 5 cents per pound.

Cut tacks, brads, or sprigs, not exceeding 16 ounces to the 1,000, $2\frac{1}{2}$ cents per 1,000; exceeding 16 ounces to the 1,000, 3 cents per pound.

Screws, commonly called wood-screws, 2 inches or over in length, 8 cents per pound; less than 2 inches in length, 11 cents per pound.

Screws of any other metal than iron, and all other screws of iron, except wood-screws, 35 per centum *ad valorem*.

Vessels of cast iron, not otherwise provided for, and on and-irons, sad-irons, tailors' and hatters' irons, stoves and stove-plates, of cast iron, $1\frac{1}{2}$ cents per pound.

Cast-iron steam, gas, and water pipe, $1\frac{1}{2}$ cents per pound.

Cast-iron butts and hinges, $2\frac{1}{2}$ cents per pound.

Hollow-ware, glazed or tinned, $3\frac{1}{2}$ cents per pound.

Cast scrap iron of every description, \$6 per ton.

Wrought scrap iron of every description, \$8 per ton. But nothing shall be deemed scrap iron except waste or refuse iron that has been in actual use, and is fit only to be remanufactured.

All other castings of iron, not otherwise provided for, 30 per centum *ad valorem*.

Taggers' iron, 30 per centum *ad valorem*.

Steel, in ingots, bars, coils, sheets, and steel wire, not less than $\frac{1}{4}$ of an inch in diameter, valued at 7 cents per pound or less, $2\frac{1}{2}$ cents per pound; valued at above 7 cents and not above 11 cents per pound, 3 cents per pound; valued at above 11 cents per pound, $3\frac{1}{2}$ cents per pound, and 10 per centum *ad valorem*.

Steel wire less than $\frac{1}{4}$ of an inch in diameter and not less than number 16, wire-gauge, $2\frac{1}{2}$ cents per pound, and in addition thereto 20 per centum *ad valorem*; less or finer than number 16, wire-gauge, 3 cents per pound, and in addition thereto 20 per centum *ad valorem*.

Steel, commercially known as crinoline, corset, and hat-steel wire, 9 cents per pound and 10 per centum *ad valorem*.

Steel, in any form, not otherwise provided for, 30 per centum *ad valorem*: *Provided*, That no allowance or reduction of duties for partial loss or damage shall be hereafter made in consequence of rust of iron or steel or upon the manufactures of iron or steel, except on polished Russia sheet iron.

Cross-cut saws, 10 cents per lineal foot.

On mill, pit, and drag saws, not over 9 inches wide, $12\frac{1}{2}$ cents per lineal foot; over 9 inches wide, 20 cents per lineal foot.

STATISTICS OF THE AMERICAN IRON TRADE.

THE American Iron and Steel Association has received from the manufacturers and from its correspondents full statistics of the production in the United States in 1875 of pig iron and blooms, bar iron, nails, iron and steel rails, and crucible and other steel; also returns showing the quantity of pig iron in stock at the close of 1875.

PRODUCTION OF PIG IRON IN 1875.

The production of pig iron in 1875 was 2,266,581 net tons, against 2,689,413 tons in 1874, 2,868,278 tons in 1873, and 2,854,558 tons in 1872. The decrease in 1875, as compared with 1874, was 422,832 tons, or more than 15 per cent. The following States, however, increased their product in 1875 over 1874: Maine, Virginia, Georgia, Indiana, Illinois, and Wisconsin. The decrease was all in anthracite and charcoal pig iron, respectively 294,098 and 165,567 tons; while there was an increase in the production of bituminous coal and coke pig iron of 36,833 tons; the net decrease being, as stated, 422,832 tons. Twenty-two States and one Territory (Utah) made pig iron in 1875. Of the 2,266,581 net tons of pig iron produced in 1875, 908,046 tons were anthracite; 947,545 tons were bituminous coal and coke; and 410,990 tons were charcoal.

The number of completed furnace stacks at the close of 1875, not including abandoned stacks, was 713, against 693 at the close of 1874, 657 at the close of 1873, and 612 at the close of 1872. The number of stacks added to the productive capacity of the country in 1875 was, therefore, 20, against 36 in 1874, and 45 in 1873. These figures, however, do not represent the whole number of new stacks built in these years, as some furnaces were abandoned in each year. The exact number of new furnaces completed in 1875 was 24, against 38 in 1874, 50 in 1873, and 41 in 1872.

Of 713 completed stacks at the close of 1875, 293 were in blast and 420 were out of blast.

The stock of pig iron unsold at the close of 1875 (that is, in the

hands of furnacemen or their agents) was 760,908 net tons, of which 320,683 were charcoal, 165,482 bituminous coal and coke, and 274,743 anthracite. The corresponding figures at the close of 1874 were as follows: charcoal, 330,317 tons; bituminous coal and coke, 216,479; anthracite, 248,988: total, 795,784. The aggregate shrinkage in the quantity of unsold pig iron at the close of 1875, as compared with the close of 1874, was 34,876 tons. It must be understood that we do not, in the preceding figures, include stocks in the hands of consumers, importers, creditors, or speculators, the statistics of which can not be obtained. But information is not wanting to enable us to affirm positively that the stocks so held were much less at the close of 1875 than at the close of 1874.

Of the total production of pig iron in 1875, Pennsylvania made 42.4 per cent.; Ohio, 18.3; New York, 11.7; Michigan, 5; New Jersey, 2.8; Wisconsin, 2.7; Missouri, 2.6; Illinois, 2.2; Kentucky, 2.1; Maryland, 1.7; Virginia, 1.3; Tennessee, 1.2; West Virginia, 1.1; Alabama, 1.1; and Indiana, Massachusetts, Georgia, Connecticut, Vermont, Maine, Oregon, North Carolina, and Utah each less than one per cent. No other States or Territories made pig iron last year.

PRODUCTION OF ROLLED IRON IN 1875.

The total production of all kinds of rolled iron in 1875 was 1,890,379 net tons, against 1,839,560 tons in 1874, 1,966,445 in 1873, and 1,941,992 in 1872. The figures given embrace all kinds of rails, cut nails and spikes, bar, band, hoop, plate, sheet, angle, girder, beam, boat, guide, rod, and bridge iron, and rolled axles, and exclude all forged iron, such as anchors, anvils, hammered axles, cranks, ships' knees, etc. Deducting nails and rails, the production of rolled iron in 1875 was 861,524 tons, against 864,538 tons in 1874, and 875,133 in 1873.

PRODUCTION OF CUT NAILS AND SPIKES IN 1875.

The production of cut nails and spikes in 1875 was 4,726,881 kegs, against 4,912,180 kegs in 1874, 4,024,704 kegs in 1873, and 4,065,322 kegs in 1872. Fourteen States made cut nails and spikes in 1875. The total number of nail-making establishments in these fourteen States was 70, and the total number of machines was 3,830. Subjoined is a tabulated statement of the manufacture of cut nails and spikes in 1875.

STATES.	Works.	Machines.	Kegs in 1875.
Maine.....	1	30	7,000
Massachusetts.....	11	710	551,798
Rhode Island.....	1	68	58,730
New York.....	3	133	81,263
New Jersey.....	4	360	522,198
Pennsylvania.....	25	1,146	1,318,259
Virginia.....	2	81	121,976
West Virginia.....	6	578	1,035,772
Georgia.....	1	20	9,300
Kentucky.....	1	80	143,473
Tennessee.....	1	12	9,795
Ohio.....	8	428	592,768
Indiana.....	4	130	185,988
Illinois.....	2	54	88,561
Total.....	70	3,830	4,726,881

PRODUCTION OF RAILS IN 1875.

The production of iron and steel rails of all sizes in 1875 was 792,512 net tons, against 729,413 tons in 1874, 890,077 in 1873, and 1,000,000 in 1872. Of the total rail production in 1875, 501,649 tons were iron rails, (in which we include a few solid steel and steel-headed rails,) against 584,469 tons in 1874; and 290,863 tons were Bessemer steel rails, against 144,944 tons in 1874. The increase in the production of Bessemer steel rails in 1875 over that of 1874 exceeded 100 per cent. We do not hesitate to predict that this country will make more Bessemer steel rails in 1876 than iron rails. Another notable feature of the rail product of 1875 was the large quantity of street rails that were made—16,340 net tons, against 6,739 tons in 1874. Of the street-rail product of 1875, 2,308 tons were made of Bessemer steel. Eighteen States and one Territory (Wyoming) made rails in 1875.

Of the total production of rails of all kinds in 1875, Pennsylvania made 32.19 per cent.; Illinois, 23.75; Ohio, 11.58; New York, 10.47; Maryland, 3.86; Wisconsin, 3.58; Indiana, 2.94; Massachusetts, 2.32; Missouri, 2.20; Tennessee, 1.55; California, 1.02; and Wyoming Territory, Georgia, Vermont, Kentucky, Kansas, Maine, New Jersey, and West Virginia each less than 1 per cent. No other States or Territories made rails in 1875.

At the close of 1875 there were in twenty-five States and the Territory of Wyoming 332 rolling-mills, of which 269 were in operation during the year. Of the whole number, ninety-seven were built to make rails, sixty to make heavy rails, and thirty-seven to make light rails. Of these, forty-five heavy and nineteen light rail mills were in operation in 1875—a total of sixty-four out of ninety seven.

PRODUCTION OF BESSEMER STEEL IN 1875.

There were 10 completed Bessemer steel establishments in this country occupied in filling orders during the whole or a part of the year 1875, two of which, Edgar Thomson and Lackawanna, went into operation for the first time in that year. A new Bessemer establishment—the Vulcan, at St. Louis—will be in operation in 1876, making 11 in all. The production of Bessemer steel rails in this country since 1867, when they were first made upon orders, has been as follows, in net tons:

1867.....	2,550	1872.....	94,070
1868.....	7,225	1873.....	129,015
1869.....	9,650	1874.....	144,944
1870.....	34,000	1875.....	290,863
1871.....	38,250		

Fuller details of the Bessemer steel industry in this country in 1874 and 1875 are as follows, in net tons:

Tons of pig iron and spiegeleisen converted.....	1874	204,352	1875	395,956
Tons of ingots produced.....	"	191,933	"	375,517
Tons of rails produced.....	"	144,944	"	290,863

In 1875, in addition to the Bessemer rails produced, many tons of Bessemer steel were used in the manufacture of spring and bar steel, railway axles, crowbars, and other railway tools, wagon and carriage tires, machinery and steamboat forgings, nails, horse-shoes, wire, screws, etc. This use of Bessemer steel is rapidly increasing in this country.

The number of net tons of spiegeleisen used in the Bessemer steel establishments of the country in 1875 was 33,245. The number of tons of spiegeleisen produced in the United States in 1875 was 7,832. The total quantity of pig iron (including spiegeleisen) converted by the Bessemer or pneumatic process was 140,404 net tons in 1872; 183,534 tons in 1873; 204,352 tons in 1874, and 395,956 tons in 1875. One-sixth of all the pig iron produced in this country in 1875 was converted into Bessemer steel, and the proportion will be much increased in 1876.

The production of Bessemer steel ingots in Great Britain has been as follows in recent years: 1870, 215,000 gross tons; 1871, 329,000 tons; 1872, 410,000 tons; 1873, 496,000 tons; 1874, 540,000 tons. This country is developing its Bessemer steel industry more rapidly than Great Britain—perhaps too rapidly.

PRODUCTION OF STEEL OTHER THAN BESSEMER IN 1875.

Forty-four establishments made cast, puddled, blister, and open-hearth steel in the United States in 1875. The aggregate production of all the kinds of steel named was 61,058 net tons, against 49,681 tons in 1874. Of the 61,058 tons produced, 39,401 tons were crucible steel, and 21,657 tons were puddled, blister, and open-hearth steel. Below is a table showing the production of steel in 1875 by States, in net tons:

STATES.	Crucible steel.	Puddled, open-hearth, and blister steel.	Total.
New England	1,620	4,510	6,130
New York.....	2,300		2,300
New Jersey.....	7,098	160	7,258
Pennsylvania.....	26,615	11,520	38,135
Maryland and Georgia.....	268	1,500	1,768
Ohio.....	1,300	3,667	4,967
Kentucky and Illinois.....	200	390	590
Total.....	39,401	21,657	61,058

The production of open-hearth or Siemens-Martin steel amounted in 1872 to 3,000 net tons; in 1873 to 3,500 tons; in 1874 to 7,000 tons, and in 1875 to 9,050 tons. The country had an annual capacity on the 1st of January, 1876, of 45,000 tons of crucible cast steel and 45,000 tons of open-hearth steel. It is to be remarked, however, that no single establishment is yet prepared to make Siemens-Martin steel in large quantities. The product of 1875 was made by twelve establishments.

Below is a table showing in net tons the total production in this country of all kinds of steel except Bessemer during the past eleven years:

1865.....	15,262	1871.....	37,000
1866.....	18,973	1872.....	40,000
1867.....	19,000	1873.....	52,000
1868.....	21,500	1874.....	49,681
1869.....	23,000	1875.....	61,058
1870.....	35,000		

PRODUCT OF FORGES AND BLOOMARIES IN 1873, 1874, AND 1875.

BLOOMS, NET TONS.	1873.	1874.	1875.
Blooms from ore.....	32,863	36,450	24,416
Blooms from pig and scrap iron.....	29,701	25,220	24,827
Total.....	62,564	61,670	49,243

The blooms from ore were mainly made in New York, and those from pig and scrap iron in Pennsylvania. The aggregate annual production of both kinds of blooms since 1865 has been as follows :

YEARS.	Net tons.	YEARS.	Net tons.
1865.....	63,977	1871.....	63,000
1866.....	73,555	1872.....	58,000
1867.....	73,073	1873.....	62,564
1868.....	75,200	1874.....	61,670
1869.....	69,500	1875.....	49,243
1870.....	62,259		

RECAPITULATION—NET TONS.

We give in the following table a summary of the total iron and steel production of this country during the past four years :

PRODUCTS.	1872.	1873.	1874.	1875.
Pig iron.....	2,854,558	2,868,278	2,689,413	2,266,581
All rolled iron, including nails and rails.....	1,941,992	1,966,445	1,839,560	1,890,379
All rolled iron, including nails and excluding rails.....	941,992	1,076,368	1,110,147	1,097,867
Bessemer steel rails.....	94,070	129,015	144,944	290,863
Iron and all other rails.....	905,930	761,062	584,469	501,649
Street rails, included in iron rails.....	15,000	9,430	6,739	16,340
Rails of all kinds.....	1,000,000	890,077	729,413	792,512
Keys of cut nails and spikes, included in all rolled iron...	4,065,322	4,024,704	4,912,180	4,726,881
Crucible cast steel.....	29,260	34,786	36,328	39,401
Open-hearth steel.....	3,000	3,500	7,000	9,050
All other steel, except Bessemer.....	7,740	13,714	6,353	12,607
Bessemer steel ingots.....	120,108	170,652	191,933	375,517
Blooms from ore and pig iron.....	58,000	62,564	61,670	49,243

PRODUCTION OF PIG IRON IN THE UNITED STATES FROM 1810 TO 1875.

It is impossible to obtain yearly statistics of the growth of the pig iron trade of this country during the first half of the present century. No agency existed for their collection. Such statistics as we have been able to compile from various government and other reliable sources of information are given below, in *gross tons*.

Years.	Pig Iron.	Years.	Pig Iron.	Years.	Pig Iron.
1810	54,000	1831	191,000	1847	800,000
1820	20,000	1832	200,000	1848	800,000
1828	130,000	1840	315,000	1849	650,000
1829	142,000	1842	215,000	1850	564,755
1830	165,000	1846	765,000	1852	500,000

On the 6th day of March, 1855, the American Iron Association (now The American Iron and Steel Association) was formally organized, and since that year it has regularly collected the statistics of

the American iron trade. Below we present a table showing the growth in *net tons* of the pig iron branch of the iron trade of the United States from 1854 to 1875, inclusive, compiled from statistics procured by the Association.

YEARS.	Anthracite.	Charcoal.	Bituminous Coal and Coke	Total.
1854.....	339,435	342,298	54,485	736,218
1855.....	381,866	339,922	62,390	784,178
1856.....	443,113	370,479	69,554	883,137
1857.....	390,385	330,321	77,451	798,157
1858.....	361,430	285,313	58,351	705,094
1859.....	471,745	284,041	84,841	840,627
1860.....	519,211	278,331	122,228	919,770
1861.....	469,229	195,278	127,037	791,544
1862.....	470,315	186,660	130,687	787,662
1863.....	577,638	212,005	157,961	947,604
1864.....	684,018	241,853	210,125	1,135,996
1865.....	479,558	262,342	189,682	931,582
1866.....	749,367	332,580	268,396	1,350,343
1867.....	798,638	344,341	318,647	1,461,626
1868.....	893,060	370,000	340,000	1,603,060
1869.....	971,150	392,150	353,341	1,716,641
1870.....	930,000	365,000	570,000	1,865,000
1871.....	956,608	385,000	570,000	1,911,608
1872.....	1,369,812	500,587	984,159	2,854,558
1873.....	1,312,754	577,620	977,904	2,868,278
1874.....	1,202,144	576,567	910,712	2,689,413
1875.....	908,046	410,990	947,545	2,266,581

In 1855 the production of anthracite pig iron overtook that of charcoal, and in 1869 the production of charcoal pig iron was again overtaken by that of bituminous coal and coke. Since 1855 anthracite has been the leading branch of our pig iron industry, and since 1869 charcoal has been the least productive of all branches. But in 1875, for the first time, the production of bituminous coal and coke pig iron was greater than that of anthracite, the figures being respectively 947,545 net tons against 908,046 tons.

In the following table we have estimated the probable consumption of pig iron in the United States in 1872, 1873, 1874, and 1875, in net tons. We discard all speculation concerning the probable quantity of pig iron carried in stock from year to year. For the purpose of this estimate it may be assumed that it has not varied greatly during the past five years.

COMMERCIAL MOVEMENT.	1871. Net tons.	1872. Net tons.	1873. Net tons.	1874. Net tons.	1875. Net tons.
Production.....	1,911,608	2,854,558	2,868,278	2,689,413	2,266,581
Importation.....	245,535	295,967	154,708	61,165	66,457
Total supply.....	2,157,143	3,150,525	3,022,986	2,750,578	2,333,038
Exportation.....	2,330	1,477	10,103	16,039	8,738
Total consumption.....	2,154,813	3,149,048	3,012,883	2,734,539	2,324,300

PRODUCTION OF RAILS IN THE UNITED STATES FROM 1849 TO 1875.

Our first importation of rails occurred about 1828, and from that year to 1844 all our rails were imported, and for the greater part of the time (from 1832 to 1843) free of duty. The first rails made in the United States were made by the Mount Savage rolling-mill, in Maryland, in 1844, but the business increased so slowly that, in December, 1849, of fifteen rail mills in the country, only two were in operation. The production of rails of all kinds from 1849 to 1875 has been as follows, in net tons:

Year.	Net tons.	Year.	Net tons.	Year.	Net tons.	Year.	Net tons.
1849.....	24,318	1856.....	180,018	1863.....	275,768	1870.....	620,000
1850.....	44,083	1857.....	161,918	1864.....	335,369	1871.....	775,733
1851.....	50,603	1858.....	163,712	1865.....	356,292	1872.....	1,000,000
1852.....	62,478	1859.....	195,454	1866.....	430,778	1873.....	890,077
1853.....	87,864	1860.....	205,038	1867.....	462,108	1874.....	729,413
1854.....	108,016	1861.....	189,818	1868.....	506,714	1875.....	792,512
1855.....	138,674	1862.....	213,912	1869.....	593,586		

The following table will show the production, importation, and probable consumption of rails in the United States from 1867 to 1875, inclusive.

CALENDAR YEARS.	Made in United States. Net tons.	Imported. Net tons.	Probable Consumption.
1867.....	462,108	163,049	625,157
1868.....	506,714	250,981	756,795
1869.....	593,586	313,163	906,749
1870.....	620,000	399,153	1,019,153
1871.....	775,733	{ Iron, 515,000 } { Steel, 50,701 }	1,341,434
1872.....	1,000,000	{ Iron, 381,064 } { Steel, 149,786 }	1,530,850
1873.....	890,077	{ Iron, 99,201 } { Steel, 159,571 }	1,148,849
1874.....	729,413	{ Iron, 7,796 } { Steel, 100,486 }	837,695
1875.....	792,512	{ Iron, 1,942 } { Steel, 16,316 }	810,770

Prior to 1871 the imports of iron and steel rails were not separated, and prior to 1867 the imports of all rails for calendar years are not procurable.

PRODUCTION OF ALL FORMS OF ROLLED IRON IN THE UNITED STATES SINCE 1864.

In the following table is presented a summary of the production of all forms of rolled iron in the United States in the twelve years from 1864 to 1875:

YEARS.	Rails.	Other Rolled Iron.	Total.
1864.....	335,369	536,958	872,327
1865.....	356,292	500,048	856,340
1866.....	430,778	595,311	1,026,089
1867.....	462,108	579,838	1,041,946
1868.....	506,714	598,286	1,105,000
1869.....	593,586	642,420	1,236,006
1870.....	620,000	705,000	1,325,000
1871.....	775,733	710,000	1,485,733
1872.....	1,000,000	941,992	1,941,992
1873.....	890,077	1,076,368	1,966,445
1874.....	729,413	1,110,147	1,839,560
1875.....	792,512	1,097,867	1,890,379

The consumption of all rolled iron, except rails, in the calendar years 1871 to 1875 is approximately indicated in the following statement :

COMMERCIAL MOVE- MENT.	1871. Net tons.	1872. Net tons.	1873. Net tons.	1874. Net tons.	1875. Net tons.
Production.....	710,000	941,992	1,076,368	1,110,147	1,098,043
Importation.....	148,032	112,788	81,675	35,000	28,481
Total supply.....	858,032	1,054,780	1,158,043	1,145,237	1,126,524
Exportation.....	233	527	541	4,925	9,693
Total consumption.....	857,799	1,054,253	1,157,502	1,140,312	1,116,831

IMPORTS AND EXPORTS OF IRON AND STEEL IN 1875.

Full tables of our imports and exports of iron and steel and manufactures thereof will be found elsewhere in this report. In the calendar year 1875 we imported, among other articles of iron and steel, 66,457 net tons of pig iron ; 24,865 tons of bar, boiler, band, hoop, and scroll iron ; 3,616 tons of sheet iron ; 1,942 tons of iron rails ; 16,316 tons of steel rails ; 25,856 tons of old and scrap iron, and steel of the value of \$2,152,303. We exported, among other articles, in the same year, 8,738 tons of pig iron ; 9,548 tons of bar iron ; 1,210 tons of rails ; 97,940 kegs of cut nails and spikes, and 370 car wheels.

IRON SHIPBUILDING IN THE UNITED STATES.

The building of iron ships in the United States dates from 1868, in which year five iron steamships were built. The following table exhibits the iron tonnage built for American registry in each fiscal year, ending June 30th, since 1868, as stated in the Report of the Register of the Treasury. Hon. J. A. Graham, Assistant Register,

writes us concerning this table: "There may be iron vessels built for foreign governments or for citizens of foreign states; if so, they are not included in the report from this office, and I have no means of ascertaining the number or tonnage of such vessels." We are unable to learn the tonnage of iron vessels built for foreign countries since 1868, but there is no reason to believe that it has been so considerable as to form an important element in the growth of our iron shipbuilding trade.

IRON VESSELS BUILT IN U. S.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.
	Ton- nage.	Ton- nage.	Ton- nage.	No. Ton- nage.	No. Ton- nage.	No. Ton- nage.	No. Ton- nage.	No. Ton- nage.
Sailing.....	None.	1,039	679	...	2,067	...	None.	...
Steam.....	2,801	3,545	7,602	20	13,412	20	12,766	26
							26,548	23
							33,097	20
Total.....	2,801	4,584	8,281	20	15,479	20	26,548	23
							33,097	20
								21,632

PRODUCTION OF LAKE SUPERIOR IRON ORE AND PIG IRON FROM
1856 TO 1875.

The following is a statement in gross tons of the aggregate yield of the mines and furnaces of this district from 1856 to 1875, inclusive, together with the value of the same, from statistics collected by A. P. Swineford, Esq., editor of the *Marquette Mining Journal*:

YEAR.	Iron Ore.	Pig Iron.	Ore and Pig Iron.	Value.
1856.....	7,000	.....	7,000	\$28,000 00
1857.....	21,000	.....	21,000	63,000 00
1858.....	31,035	1,629	32,664	249,202 00
1859.....	65,679	7,258	72,937	575,529 00
1860.....	116,908	5,660	122,568	736,496 00
1861.....	45,430	7,970	53,400	419,501 00
1862.....	115,721	8,590	124,311	984,977 00
1863.....	185,257	9,813	195,070	1,416,935 00
1864.....	235,123	13,832	248,955	1,867,215 00
1865.....	196,256	12,283	208,539	1,590,430 00
1866.....	296,972	18,437	315,409	2,405,960 00
1867.....	466,076	30,911	496,987	3,475,820 00
1868.....	507,813	38,246	546,059	3,992,413 00
1869.....	633,238	39,003	672,241	4,968,435 00
1870.....	856,471	49,298	905,769	6,300,170 00
1871.....	813,379	51,225	864,604	6,115,895 00
1872.....	952,055	63,195	1,015,250	9,188,055 00
1873.....	1,167,379	71,507	1,238,886	11,395,887 00
1874.....	935,488	90,494	1,025,982	7,592,811 00
1875.....	910,840	81,753	992,593	5,788,763 00
Total.....	8,559,120	601,104	9,160,224	\$69,155,494 00

About one-fourth of the total production of the blast furnaces of the United States is smelted from Lake Superior ores, the price of which at Cleveland in 1876 is but little more than one-half the price

received in 1873, before the panic: say \$7 for best specular in 1876 to \$12 and \$13 in 1873.

Further particulars concerning the Lake Superior iron district may be found in A. P. Swineford's *History of the Lake Superior Iron District*, just published at Marquette.

IMPORTS OF IRON ORE.

Below we present a table, compiled from the Commerce and Navigation Reports of the Bureau of Statistics, showing the invoice value of the iron ore imported into the United States during the six fiscal years which ended June 30, 1875. The quantity imported is not given, but it may be approximately estimated in tons at one-half the value given, the invoice value being about 82 a ton.

Fiscal Year.	New York.	Boston.	Balti- more.	San Francisco.	Lake Ports.	Philadel- phia.	Other Ports.	Total.
1870....					\$34,439		\$165	\$34,604
1871....	\$153				66		143	362
1872....	2,116				49,607		1,590	53,313
1873....	29,152	1,434		\$385	92,856		575	124,402
1874....	21,544	173	\$11,520		105,167		110	138,514
1875....	16,253				74,425	\$55,896	85	146,659

SUPPLEMENTARY TABULATED STATEMENTS.

On the following pages we present elaborate tables of the production, exportation, prices, and cost of American iron and steel, and a table of our importations of foreign iron. The tables of production are the admirable handiwork of Mr. George W. Cope, the Assistant Secretary of this Association. The data for the tables of exports and imports were mainly supplied to us by that most capable and accommodating gentleman, Hon. Edward Young, Chief of the United States Bureau of Statistics. The tables of prices are the work in part of Mr. William G. Neilson, and were prepared by him for this Association several years ago. They have been brought down to the present time in this office. The table showing the cost of making a ton of pig and of bar iron for a long series of years has been prepared by Mr. William E. S. Baker, Secretary of The Eastern Ironmasters' Association.

For the information of such foreign gentlemen as may see this report, we state that the net ton used in the tables is composed of 2,000 pounds, and the gross ton of 2,240 pounds.

PRODUCTION OF PIG IRON (ALL KINDS) IN 1872, 1873, 1874, AND 1875, BY STATES.

Statistics collected from the manufacturers by The American Iron and Steel Association.

STATES.	Whole No. com- pleted stacks Dec. 31, 1872.	Whole No. com- pleted stacks Dec. 31, 1873.	Whole No. com- pleted stacks Dec. 31, 1874.	No. of stacks in blast Dec. 31, 1875.	No. of stacks out of blast Dec. 31, 1875.	Make of pig iron in 1872. Net tons.	Make of pig iron in 1873. Net tons.	Make of pig iron in 1874. Net tons.	Make of pig iron in 1875. Net tons.
Maine.....	1	1	1	1			780	1,651	2,046
Vermont.....	2	2	2			2,000	3,106	3,450	2,400
Massachusetts.....	6	6	6	4	2	17,070	21,136	27,991	21,255
Connecticut.....	10	10	10	5	5	22,700	26,977	14,518	10,880
New York.....	53	58	57	25	31	291,155	296,818	326,721	266,431
New Jersey.....	16	17	18	6	12	103,858	102,341	90,150	64,069
Pennsylvania.....	262	266	278	118	160	1,401,497	1,389,573	1,213,133	960,884
Maryland.....	22	23	24	7	17	63,031	55,986	54,556	38,741
Virginia.....	35	38	34	8	25	21,445	25,475	29,451	29,985
North Carolina.....	8	8	8		8	1,073	1,432	1,340	800
Georgia.....	8	10	12	5	7	2,945	7,501	9,786	16,508
Alabama.....	11	14	14	6	8	12,512	22,283	32,863	25,108
Texas.....	1	1	1		1	619	280	1,012	
West Virginia.....	6	9	12	4	5	20,796	23,056	30,134	25,277
Kentucky.....	25	27	23	8	15	67,396	69,889	61,227	48,339
Tennessee.....	20	22	22	7	15	42,454	43,134	48,770	28,311
Ohio.....	88	93	100	54	46	399,743	406,029	425,001	415,893
Indiana.....	8	8	9	4	5	39,221	32,486	13,732	22,681
Illinois.....	10	10	12	3	9	78,627	55,796	37,946	49,762
Michigan.....	33	34	34	14	20	100,222	123,506	136,662	114,805
Wisconsin.....	13	14	14	6	8	65,036	74,148	50,792	62,139
Missouri.....	18	19	19	6	13	101,158	85,552	75,817	59,717
Oregon.....	1	1	1	1			2,500		1,000
Utah.....		1	1		1			200	150
Minnesota.....		1	1		1				
Total.....	657	693	713	293	420	2,854,558	2,868,278	2,689,413	2,266,581

ANTHRACITE.

Massachusetts.....	1	1	1	1		4,250	5,432	10,214	11,140
New York.....	36	41	41	21	20	271,343	267,489	298,428	254,935
New Jersey.....	16	17	18	6	12	103,858	102,341	90,150	64,069
Pennsylvania.....	149	152	161	70	91	968,453	913,085	775,008	554,992
Maryland.....	4	5	3	1	2	21,908	20,407	22,344	15,840
Virginia.....	1	1	1	1			4,000	6,000	7,070
Total.....	207	217	225	100	125	1,369,812	1,312,754	1,202,144	908,046

BITUMINOUS COAL AND COKE.

Pennsylvania.....	74	75	78	33	45	388,011	430,634	397,147	371,401
Maryland.....	4	4	6	1	5	12,079	5,264	7,209	1,751
Virginia.....			5	3	2				7,519
North Carolina.....			1		1				
Georgia.....	1	1	3	3				5,516	12,685
Alabama.....			2		2				
West Virginia.....	2	5	6	3	3	19,846	21,106	26,734	24,177
Kentucky.....	3	4	4	3	1	27,697	27,670	24,583	26,060
Tennessee.....	3	4	4	2	2	8,360	8,602	11,543	10,800
Ohio.....	51	56	63	39	24	304,121	305,531	332,166	353,922
Indiana.....	7	7	8	3	5	39,221	32,486	11,632	20,381
Illinois.....	10	10	12	3	9	78,627	55,796	37,946	49,762
Michigan.....	4	4	4	1	3	13,882	9,531	7,693	13,000
Wisconsin.....	3	3	3	2	1	37,246	35,268	21,819	36,656
Missouri.....	9	8	8	2	6	55,569	46,016	26,724	19,931
Total.....	171	181	207	98	109	984,159	977,904	910,712	947,545

PRODUCTION OF PIG IRON IN 1872, 1873, 1874, AND 1875.—Continued.

CHARCOAL.

STATES.	Whole No. com- pleted stacks Dec. 31, 1873.	Whole No. com- pleted stacks Dec. 31, 1874.	Whole No. com- pleted stacks Dec. 31, 1875.	No. of stacks in blast Dec. 31, 1875.	No. of stacks out of blast Dec. 31, 1875.	Make of pig iron in 1872. Net tons.	Make of pig iron in 1873. Net tons.	Make of pig iron in 1874. Net tons.	Make of pig iron in 1875. Net tons.
Maine.....	1	1	1	1	.....	.....	780	1,661	2,046
Vermont.....	2	2	2	.....	2	2,000	3,100	3,450	2,400
Massachusetts.....	3	5	5	3	2	12,820	15,704	17,777	10,115
Connecticut.....	10	10	10	5	5	22,700	26,977	14,518	10,880
New York.....	17	17	16	5	11	19,812	29,329	28,293	11,496
Pennsylvania.....	39	39	39	15	24	45,033	45,854	40,978	34,491
Maryland.....	14	14	15	5	10	29,044	30,315	25,003	21,150
Virginia.....	34	37	28	4	24	21,445	22,475	23,451	15,396
North Carolina.....	8	8	7	.....	7	1,073	1,432	1,340	800
Georgia.....	7	9	9	2	7	2,945	7,501	4,270	3,823
Alabama.....	11	14	12	6	6	12,512	22,283	32,863	25,108
Texas.....	1	1	1	.....	1	619	280	1,012	.....
West Virginia.....	4	4	6	1	5	950	1,950	3,400	1,100
Kentucky.....	22	23	19	5	14	39,699	42,219	36,644	22,279
Tennessee.....	17	18	18	5	13	34,094	34,532	37,227	18,011
Ohio.....	37	37	37	15	22	95,622	100,498	92,835	61,971
Indiana.....	1	1	1	1	.....	.....	.....	2,100	1,700
Michigan.....	29	30	30	13	17	86,840	113,975	128,969	101,805
Wisconsin.....	10	11	11	4	7	27,790	38,880	28,973	25,483
Missouri.....	9	11	11	4	7	45,529	39,536	49,093	39,786
Oregon.....	1	1	1	1	.....	.....	.....	2,500	1,000
Utah.....	1	1	1	.....	.....	.....	.....	200	150
Minnesota.....	1	1	1	.....	1	.....	.....	.....	.....
Total.....	279	295	281	95	186	500,587	577,620	576,557	410,990

RECAPITULATION.

KINDS OF PIG IRON.	Whole No. com- pleted stacks Dec. 31, 1873.	Whole No. com- pleted stacks Dec. 31, 1874.	Whole No. com- pleted stacks Dec. 31, 1875.	No. of stacks in blast Dec. 31, 1875.	No. of stacks out of blast Dec. 31, 1875.	Make of pig iron in 1872. Net tons.	Make of pig iron in 1873. Net tons.	Make of pig iron in 1874. Net tons.	Make of pig iron in 1875. Net tons.
Anthracite.....	207	217	225	100	125	1,369,812	1,312,754	1,262,144	908,046
Charcoal.....	279	295	281	95	186	500,587	577,620	576,557	410,990
Bituminous coal and coke.....	171	181	207	98	109	984,159	977,994	910,712	947,545
Total.....	657	693	713	293	420	2,854,558	2,868,278	2,749,413	2,266,581

PRODUCTION OF PIG IRON IN CERTAIN DISTRICTS.

Pennsylvania.	Lehigh Valley.....	47	47	50	25	25	449,663	389,969	316,789	280,360
	Schuylkill Valley.....	40	43	50	20	30	232,225	236,409	232,420	123,184
	Upper Susquehanna.....	25	25	25	11	14	127,260	129,304	88,243	71,731
	Lower Susquehanna.....	37	37	36	14	22	159,303	157,403	137,556	79,717
	Shenango Valley.....	31	32	32	12	20	160,188	160,831	156,419	137,025
	Pittsburgh and Alle- gheny County.....	11	11	11	6	5	110,599	158,789	143,660	131,856
	Miscellaneous coke.....	32	32	35	15	20	117,224	111,014	97,068	102,520
	Hanging Rock coke.....	7	10	15	8	7	23,169	28,601	26,015	30,829
	Mahoning Valley.....	22	22	22	12	10	152,756	136,972	121,463	115,993
	Miscellaneous coke.....	22	24	26	19	7	128,196	139,938	184,748	201,030
Ohio.	Hanging Rock char- coal.....	33	34	34	13	21	87,440	92,365	85,873	57,413
	Miscellaneous char- coal.....	4	3	3	2	1	8,182	8,133	6,962	4,558

STOCK OF PIG IRON, UNSOLD, DECEMBER 31, 1874, AND DECEMBER 31, 1875.

Statistics collected from the manufacturers by *The American Iron and Steel Association.*

STATES AND DISTRICTS.	Anthracite.—Net tons.		Bituminous Coal and Coke.—Net tons.		Charcoal.—Net tons.		Total.—Net tons.	
	1874.	1875.	1874.	1875.	1874.	1875.	1874.	1875.
New England and New York.....	101,095	81,052	.....	.....	37,128	43,455	138,224	124,507
New Jersey.....	37,959	26,045	.....	.....	.....	.....	37,959	26,045
Lehigh Valley.....	28,791	60,878	.....	.....	.....	.....	28,791	60,878
Schuylkill Valley.....	40,787	79,155	.....	.....	.....	.....	40,787	79,155
Upper Susquehanna.....	12,868	13,980	.....	.....	.....	.....	12,868	13,980
Lower Susquehanna.....	22,990	19,163	.....	.....	.....	.....	22,990	19,163
Shenango Valley.....	.....	.....	87,650	35,997	.....	.....	87,650	35,997
Allegheny county.....	.....	.....	12,220	4,920	.....	.....	12,220	4,920
Miscellaneous bituminous.....	.....	.....	15,591	21,323	.....	.....	15,591	21,323
Charcoal.....	.....	.....	.....	21,533	21,533	22,392	21,533	22,392
Total for Pennsylvania.....	105,436	163,176	115,471	61,340	21,533	22,392	242,440	246,908
Maryland.....	4,497	4,185	3,853	256	7,608	9,325	15,958	13,767
Virginia, Georgia, Alabama, and Texas.....	.....	235	3,989	3,331	33,033	30,564	39,042	34,070
West Virginia.....	.....	.....	5,601	300	3,310	3,100	8,971	3,400
Kentucky.....	.....	.....	8,080	11,295	24,912	16,255	32,992	27,590
Tennessee.....	.....	.....	2,781	2,000	24,983	17,559	27,766	19,559
Hanging Rock.....	.....	.....	11,490	17,525	58,297	53,882	69,747	71,405
Shannon Valley.....	.....	.....	25,777	14,611	.....	.....	25,777	14,611
Miscellaneous.....	.....	.....	11,952	31,828	10,608	10,189	22,560	42,017
Total for Ohio.....	.....	.....	49,179	63,962	68,905	64,071	118,084	128,033
Michigan and Indiana.....	.....	.....	8,796	7,181	57,891	51,367	66,687	58,548
Illinois.....	.....	.....	7,229	5,816	.....	.....	7,229	5,816
Wisconsin.....	.....	.....	.....	1,659	9,138	8,753	9,138	10,392
Missouri.....	.....	.....	11,500	8,362	39,794	53,407	51,294	61,769
Pacific States and Territories.....	.....	.....	.....	.....	.....	454	.....	454
Grand total.....	248,988	274,743	216,479	165,482	330,317	320,683	795,784	760,908

Note.—The above figures were obtained from the furnaces themselves, and therefore only indicate the quantity of pig iron in the hands of the producers and their agents. The pig iron in the hands of creditors, importers, speculators, and consumers is not considered in this table.

PRODUCTION OF ALL ROLLED IRON IN THE UNITED STATES IN 1873, 1874, AND 1875.

Statistics collected from the manufacturers by *The American Iron and Steel Association.*

STATES.	Bar, Angle, Bolt, Rod, and Hoop Iron. Net tons.			Plate and Sheet Iron. Net tons.			Cut Nails and Spikes. Net tons.			Iron and Steel Rails, all sizes. Net tons.			Total Rolled Iron. Net tons.		
	1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.
Maine.....	4,710	3,994	3,700										21,210	18,544	8,109
New Hampshire.....	300	300	1,000										300	300	1,000
Vermont.....	8,080	7,750	6,648										6,088	10,400	6,204
Massachusetts.....	44,430	40,324	40,326										118,669	100,900	99,712
Rhode Island.....	11,409	11,921	9,618										11,662	10,616	9,384
Connecticut.....	83,908	75,710	90,383										11,409	11,921	9,618
New York.....	83,904	24,643	24,384										154,782	133,318	181,696
New Jersey.....	33,395	34,632	300,784										77,688	58,081	85,249
Pennsylvania.....	8,274	6,890	9,316										833,584	798,169	738,839
Delaware.....	1,960	8,435	6,279										11,617	11,818	15,252
Maryland.....	7,462	11,086	12,744										68,025	68,891	46,637
Virginia.....	1,840	1,065	3,360										12,808	16,688	18,843
Georgia.....	500	1,060	1,000										10,624	9,467	10,325
Alabama.....	2,803	1,679	1,805										500	1,000	1,000
West Virginia.....	25,675	18,239	13,936										51,796	56,332	54,299
Kentucky.....	2,588	1,573	1,905										37,905	34,548	38,961
Tennessee.....	103,898	94,413	93,890										16,561	15,926	13,745
Ohio.....	4,500	7,376	11,465										272,066	220,370	237,591
Indiana.....	5,240	2,590	6,000										36,006	35,507	44,073
Illinois.....	2,284	4,207	1,825										143,017	134,093	200,676
Michigan.....													8,542	8,208	3,460
Wisconsin.....													39,495	29,955	42,840
Minnesota.....													22,621	36,387	31,540
Wyoming Territory.....													7,000	7,000	7,000
Kansas.....													2,000	5,000	5,000
California.....													7,420	16,221	14,194
Total.....	705,064	687,650	668,755	169,169	176,888	192,769	201,235	245,609	236,343	890,077	729,413	792,512	1,966,445	1,839,560	1,890,379

PRODUCTION OF RAILS IN THE UNITED STATES IN 1873, 1874, AND 1875.

Statistics collected from the manufacturers by The American Iron and Steel Association.

In the following table Bessemer steel rails of all sizes, except street rails, are necessarily classed with iron rails weighing over forty pounds.

STATES.	Iron and Bessemer Steel Rails, over forty pounds to yard—Net tons.			Iron Rails, under forty pounds—Net tons.			Steel Rails, other than Bessemer, and Steel-headed Rails—Net tons.			Street Rails—Net tons.			Total—Net tons.		
	1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.
Maine.....	16,500	14,650	4,050	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,500	14,650	4,050
Vermont.....	5,554	9,400	6,204	.....	.....	.....	584	1,000	.....	.....	.....	.....	6,088	10,400	6,204
Massachusetts.....	34,034	24,765	18,391	.....	.....	.....	15,953	14,007	17,472	.....	.....	.....	34,034	24,765	18,391
New York.....	43,669	32,487	65,403	.....	.....	85	4,474	597	.....	242	485	.....	59,764	46,979	82,960
New Jersey.....	7,215	2,423	765	.....	.....	.....	6,474	597	.....	60	517	176	13,749	3,537	941
Pennsylvania.....	304,587	235,262	224,641	.....	.....	.....	1,022	1,377	464	5,563	*2,917	49,303	328,522	259,288	255,136
Maryland.....	42,356	48,008	30,619	.....	.....	.....	.....	.....	.....	.....	.....	.....	42,356	48,008	30,619
Georgia.....	8,275	8,061	5,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,275	8,061	5,000
West Virginia.....	4,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,000	.....	.....
Kentucky.....	10,339	4,500	3,300	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,886	6,068	5,851
Tennessee.....	11,763	13,493	12,250	.....	.....	.....	.....	.....	.....	458	418	600	13,973	13,693	12,250
Ohio.....	121,187	73,101	85,283	.....	.....	.....	.....	.....	.....	50	.....	.....	130,326	82,561	91,775
Indiana.....	26,579	20,095	22,183	.....	.....	.....	.....	.....	.....	2,749	1,876	2,585	26,579	20,617	23,309
Illinois.....	134,625	125,017	185,164	.....	.....	.....	.....	.....	.....	.....	.....	.....	136,102	125,103	188,248
Michigan.....	4,433	1,818	.....	.....	.....	.....	.....	.....	.....	258	86	42,149	4,433	9,448	.....
Wisconsin.....	39,495	28,840	26,385	.....	.....	.....	.....	.....	.....	.....	.....	.....	39,495	29,680	28,403
Missouri.....	14,020	22,517	16,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	14,020	24,017	17,595
Kansas.....	.....	2,000	5,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,000	5,000
Wyoming Territory.....	.....	.....	7,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,000
California.....	.....	6,576	3,691	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,073
Total.....	828,631	673,013	722,329	.....	.....	.....	.....	.....	.....	9,430	6,739	16,340	890,077	729,413	792,512

* Includes 1,000 tons of Bessemer steel street rails.

† Includes 1,350 tons of Bessemer steel street rails.

‡ Includes 922 tons of Bessemer steel street rails.

**PRODUCTION OF RAILS OF ALL KINDS FOR 1871, 1872, 1873, 1874,
AND 1875.—NET TONS.**

Statistics collected from the manufacturers by The American Iron and Steel Association.

STATES.	1871.	1872.	1873.	1874.	1875.	Percentage of the whole product made in each State in 1875.
Pennsylvania.....	335,604	449,113	328,522	259,288	255,136	32.19
Illinois.....	91,178	107,496	136,102	125,103	188,248	23.75
Ohio.....	75,782	138,165	130,326	82,561	91,775	11.58
New York.....	87,022	86,518	59,764	46,979	82,960	10.47
Maryland.....	44,941	39,533	42,356	48,008	30,619	3.86
Wisconsin.....	28,774	37,284	39,495	29,680	28,403	3.58
Indiana.....	12,778	23,893	26,579	20,617	23,309	2.94
Massachusetts.....	25,864	29,242	34,034	24,763	18,391	2.32
Missouri.....	8,200	15,500	14,020	24,017	17,396	2.20
Tennessee.....	9,667	14,629	13,973	13,693	12,250	1.55
California.....			475	7,016	8,073	1.02
Wyoming Territory.....					7,000	.88
Georgia.....	7,840	6,930	8,275	8,061	6,500	.82
Vermont.....			6,088	10,400	6,204	.78
Kentucky.....	6,000	7,480	11,386	6,068	5,851	.74
Kansas.....				2,000	5,000	.63
Maine.....	13,383	14,058	16,500	14,650	4,050	.51
New Jersey.....	6,700	9,185	13,749	3,537	941	.12
West Virginia.....	5,000	20,100	4,000	522	406	.06
Michigan.....	14,000	9,883	4,433	2,448		
Total.....	775,733	1,000,000	890,077	729,413	792,512	100.00

**PRODUCTION OF ROLLED IRON (EXCLUDING RAILS) AND OF CUT
NAILS AND SPIKES, PRODUCED IN ALL THE STATES
IN 1873, 1874, AND 1875.**

Statistics collected from the manufacturers by The American Iron and Steel Association.

STATES.	Bar, Angle, Bolt, Rod, Hoop, Plate, and Sheet Iron. Net tons.			Cut Nails and Spikes. Kegs of 100 pounds.		
	1873.	1874.	1875.	1873.	1874.	1875.
Maine.....	4,710	3,994	3,700			7,000
New Hampshire.....	300	300	1,000			
Massachusetts.....	53,312	46,916	53,731	626,465	576,376	551,798
Rhode Island.....	8,000	7,170	6,648	73,249	68,920	58,730
Connecticut.....	11,409	11,921	9,618			
New York.....	90,796	89,590	94,583	84,438	118,985	81,263
New Jersey.....	41,112	26,901	28,198	456,537	552,867	522,198
Pennsylvania.....	447,282	463,730	417,781	1,195,609	1,503,019	1,318,259
Delaware.....	11,617	11,818	15,252			
Maryland.....	15,669	20,883	16,068			
Virginia.....	7,462	11,086	12,744	106,922	112,034	121,976
Georgia.....	1,840	1,406	3,350	10,183		9,300
Alabama.....	500	1,000	1,000			
West Virginia.....	3,863	1,609	2,105	878,653	1,084,027	1,035,772
Kentucky.....	26,569	23,359	20,936		102,411	143,473
Tennessee.....	2,588	1,573	1,005		13,210	9,795
Ohio.....	118,709	119,556	116,178	460,618	645,052	592,768
Indiana.....	4,500	7,376	11,465	98,530	150,279	185,988
Illinois.....	5,240	4,749	8,000	33,500	85,000	88,561
Michigan.....	4,109	5,769	3,450			
Wisconsin.....		275	14,437			
Missouri.....	8,601	12,370	14,144			
California.....	6,945	9,205	6,121			
Total.....	875,133	864,538	861,524	4,024,704	4,912,180	4,726,881

EXPORTS OF AMERICAN IRON PRODUCTS.

Table showing the Quantity or Value of Domestic Iron and Manufactures of Iron and Steel exported to all countries from the United States, for the year 1770, and from 1791 to 1821 inclusive.—Tons of 2,240 pounds.

From Pitkin's Statistical View of the Commerce of the United States.

COMMODITIES.	1770.	1770.	1791.	1792.	1793.	1794.
Pig iron.....	6,017 tons.	\$145,628	4,179 tons.	3,268 tons.	2,089 tons.	2,037 tons.
Bar iron.....	2,463 "	178,891	350 "	360 "	763 "	843 "
Castings.....	2 "	158	\$2,598	\$3,202	\$12,200	\$2,681
Wrought iron.....	8 "	810				
Manufactured iron.....			3,500	8,000	10,250	24,394

	1795.	1796.	1797.	1798.	1799.	1800.
Pig iron.....	1,046 tons.	502 tons.	597 tons.	128 tons.	140 tons.	190 tons.
Bar iron.....	2,444 "	843 "	204 "	793 "	614 "	531 "
Castings.....	\$3,500	\$453	\$22,001	\$29,861	\$16,573	\$11,174
Wrought iron.....						
Manufactured iron.....	25,600	160,094	135,594	173,074	271,575	372,261

	1801.	1802.	1803.	1804.	1805.	1806.
Pig iron.....	223 tons.	535 tons.	877 tons.	454 tons.	365 tons.	79 tons.
Bar iron.....	70 "	100 "	177 "	379 "	927 "	307 "
Castings.....	\$22,798	\$21,106	\$5,923	\$9,168	\$25,821	\$47,041
Manufactured iron.....	300,316	317,825				
Nails.....			77,551 lbs.	110,780 lbs.	278,051 lbs.	218,805 lbs.
Other manufactures of iron or iron and steel.....			\$21,261	\$40,827	\$40,559	\$29,700

	1807.	1808.	1809.	1810.	1811.	1812.
Pig iron.....	114 tons.	9 tons.	70 tons.	93 tons.	21 tons.	.....
Bar iron.....	132 "	67 "	277 "	429 "	217 "	63 tons.
Castings.....	\$55,394	\$4,165	\$5,595	\$9,410	\$8,143	\$1,750
Nails.....	336,321 lbs.	30,327 lbs.	272,723 lbs.	377,373 lbs.	347,925 lbs.	82,785 lbs.
Other manufactures of iron or iron and steel.....	\$41,239	\$5,899	\$30,461	\$39,293	\$31,454	\$36,316

	1813.	1814.	1815.	1816.
Pig iron.....			152 tons.	15 tons.
Bar iron.....			80 "	47 "
Castings.....	\$19,621	\$19	\$5,749	\$14,649
Nails.....	14,369 lbs.	42,763 lbs.	90,294 lbs.	158,877 lbs.
Other manufactures of iron or iron and steel.....	\$812	\$6,581	\$50,055	\$161,394

From Hon. Edward Young, Chief of the U. S. Bureau of Statistics.

	1817.	1818.	1819.	1820.	1821.
Pig iron.....	200 tons.		\$250		
Bar iron.....	22 "	\$3,234	160	\$2,835	\$70,270
Castings.....	\$36,782	14,963	10,638	3,484	11,121
Nails.....	473,025 lbs.	21,356	14,686	13,509	{ Included in bar iron.
Other manufactures of iron or iron and steel.....	\$45,942	33,426	28,407	36,675	26,692
Total.....		\$72,979	\$54,141	\$56,503	\$108,083

NOTE.—From 1770 to 1790 there exists no record of exports of iron products. From 1791 to 1803 the returns do not separate foreign from domestic articles exported; but the great bulk, I not all, of the iron exported was undoubtedly of domestic manufacture. From 1791 to 1842, inclusive, the amounts stated are for the several years ended September 30th.

EXPORTS OF AMERICAN IRON PRODUCTS.

Table Showing the Value of the Exports of Domestic Iron and Iron and Steel Manufactures from the United States for the Fiscal Years 1822 to 1863, inclusive.

Specially prepared for this Association by Edward Young, Chief of the Bureau of Statistics.

COMMODITIES.	1822.	1823.	1824.	1825.	1826.	1827.
Pig. bar, and nails.....	\$49,812	\$44,129	\$56,886	\$55,390	\$52,959	\$69,745
Castings.....	12,732	2,564	28,515	51,884	74,726	24,468
Other manufactures of iron or iron and steel.....	70,183	50,578	57,573	48,899	121,275	178,945
Fire-engines and apparatus.....					4,935	2,513
Total.....	\$132,727	\$97,271	\$142,974	\$156,173	\$253,895	\$275,671
	1828.	1829.	1830.	1831.	1832.	1833.
Pig. bar, and nails.....	\$64,343	\$70,767	\$96,189	\$62,376	\$65,979	\$72,177
Castings.....	34,375	23,301	35,408	21,827	26,629	48,009
Other manufactures of iron or iron and steel.....	132,516	129,637	177,876	149,438	120,222	113,626
Fire-engines and apparatus.....	2,884	2,832		5,630	7,758	9,791
Total.....	\$233,618	\$226,537	\$309,473	\$239,271	\$220,588	\$243,603
	1834.	1835.	1836.	1837.	1838.	1839.
Pig. bar, and nails.....	\$58,744	\$90,266	\$78,533	\$151,040	\$102,523	\$134,588
Castings.....	65,762	70,922	85,599	90,390	33,451	61,100
Other manufactures of iron or iron and steel.....	111,985	134,687	141,873	250,768	573,434	748,862
Fire-engines and apparatus.....	86	1,482	2,661	2,710	2,784	2,036
Total.....	\$236,577	\$297,357	\$308,666	\$494,908	\$712,192	\$946,586
	1840.	1841.	1842.	1843.	1844.	1845.
Pig. bar, and nails.....	\$147,397	\$138,537	\$120,454	\$120,923	\$133,522	\$77,669
Castings.....	115,664	99,904	68,507	41,189	54,598	118,248
Other manufactures of iron or iron and steel.....	841,394	806,823	920,561	370,581	528,212	649,100
Fire-engines and apparatus.....	6,317	561	1,304			12,660
Total.....	\$1,110,772	\$1,045,825	\$1,110,826	\$532,693	\$716,332	\$857,677
	1846.	1847.	1848.	1849.	1850.	1851.
Pig. bar, and nails.....	\$122,225	\$168,817	\$154,036	\$149,358	\$134,210	\$215,632
Castings.....	107,905	68,889	83,188	60,175	79,318	164,425
Other manufactures of iron or iron and steel.....	921,632	929,778	1,022,408	886,639	1,677,792	1,875,621
Fire-engines and apparatus.....	9,802	3,443	7,686	458	3,140	9,488
Total.....	\$1,161,584	\$1,170,927	\$1,267,318	\$1,096,630	\$1,914,460	\$2,265,186
	1852.	1853.	1854.	1855.	1856.	1857.
Pig. bar, and nails.....	\$118,624	\$181,998	\$302,279			
Castings.....	191,388	220,420	458,202	\$306,439	\$288,316	\$289,967
Other manufactures of iron or iron and steel.....	1,993,807	2,097,234	3,449,869	3,158,596	3,885,712	4,197,687
Fire engines and apparatus.....	16,784	9,652	6,597	14,829	29,088	21,824
Pig iron.....				23,060	27,215	53,390
Bar iron.....				10,189	21,382	64,596
Nails.....				255,188	238,383	279,327
Total.....	\$2,320,603	\$2,509,304	\$4,216,947	\$3,768,301	\$4,190,096	\$4,906,491
	1858.	1859.	1860.	1861.	1862.*	1863.*
Pig iron.....	\$24,087	\$21,213	\$19,143	\$25,826	\$38,412	\$29,527
Bar iron.....	26,082	48,226	38,257	15,411	45,584	10,839
Nails.....	155,762	188,223	188,754	270,084	178,856	411,055
Castings.....	464,415	128,659	282,844	76,750	54,671	56,959
Other manufactures of iron or iron and steel.....	4,059,528	5,117,346	5,174,040	5,536,576	4,212,448	5,957,193
Fire-engines and apparatus.....	7,220	3,213	9,948	7,940	36,230	9,706
Total.....	\$4,737,094	\$5,506,880	\$5,712,986	\$5,932,587	\$4,563,201	\$6,475,279

NOTE.—Until 1842 the fiscal year ended September 30th. The figures for 1843 are only for nine months, ending June 30th. From and including 1844 the fiscal year has ended June 30th.

* Values in currency, except the exports from Pacific Ports.

EXPORTS OF AMERICAN IRON PRODUCTS.

Table showing the Value of the Exports of Domestic Iron and Steel Manufactures from the United States for the Fiscal Years 1864 to 1870, inclusive. [Values in currency except from Pacific Ports.]

Specially prepared for this Association by Edward Young, Chief of the Bureau of Statistics, Washington, D. C.

COMMODITIES.	1864.	1865.	1866.	1867.	1868.	1869.	1870.
IRON—Pig.....	\$46,618	\$32,179	\$62,594	\$27,021	\$10,726	\$4,112	\$50,127
Bar.....	9,003	12,844	21,166	16,373	20,269	13,088	26,024
Nails.....	484,113	947,638	330,902	321,716	388,650	220,380	265,951
Castings.....	76,516	62,400	47,361	11,719	17,274	25,229	74,537
Car-wheels.....							43,753
Shot and shell.....							174,377
Boiler-plate.....	13,674	1,934		325,343	67,904		3,969
Hoops and hoop iron.....	3,284	5,625			16,060		3,824
Sheet.....							
Stoves, and parts of.....	162,005	220,610			2,630		
Steam-engines.....	206,300	611,396		70,452	64,025		102,338
Boilers for engines.....							74,067
Locomotives.....	418,176	587,290		2,699	31,988		21,647
Other machinery.....	1,676,414	2,178,801					341,794
Machinery furnishings.....	114,486	104,068					1,913,384
Railings and furniture.....	6,533	28,112		2,218,326	2,576,937	2,948,165	
Safes and doors.....	53,188	64,425					
Rails.....	28,417	103,072					
Railroad frogs, chairs, etc.....	7,385	19,231					
Ore.....			45,777	23,823	1,424	18,665	65,081
Sewing-machines.....	1,062,708	5,463					
Manufactures not specified.....	955,892	2,005,484		1,650,340	1,657,942	2,051,581	2,233,326
STEEL—Bars, sheets, etc.....	4,820	939,467	3,162,751	3,469,862	2,812,091		2,402,652
Cutlery and steel tools.....	415,846	4,811	2,875	2,408	8,631		5,755
Cutlery.....		569,934					
Dental materials.....				194,903	221,529	417,786	176,596
Files, saws, and tools.....	16,971	26,143					
Fire-arms.....	3,231				5,088		310,021
Side-arms.....				874,337	2,767,394	1,983,886	5,015,732
Hardware.....	1,483,378	2,151,328		6,257	9,994		
Other manufactures not specified.....	19,594	75,607	107,755	28,606	145,282	2,039,875	105,650
Fire-engines and apparatus.....	14,222	28,637	38,373	98,216	20,872	1,081,181	3,838
Total.....	\$7,283,166	\$10,786,559	\$3,759,554*	\$9,487,883	\$10,784,654	\$10,873,948	\$13,414,443

*This amount is evidently erroneous. It is probable that locomotives and other machinery, and perhaps sewing-machines, are included in "unenumerated articles: manufactures," which is that year amounted to \$6,901,001. About six millions of this should be added to the exports of manufactures of iron. It is proper to state that the fiscal year 1866 terminated on the 30th of June, 1866, and previous to the organization of the Bureau of Statistics.—E. Y.

DOMESTIC EXPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF FROM THE UNITED STATES TO ALL COUNTRIES DURING THE FISCAL YEARS 1871 TO 1875.—CURRENCY VALUES.

Prepared from statistics furnished by Dr. Edward Young, Chief of the U. S. Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
IRON, AND MANUFACTURES OF:										
Pig iron.....	3,967	\$111,033	2,269	\$69,331	3,154	\$140,653	10,798	\$414,728	17,681	\$489,362
Bar iron.....	203	16,754	40	4,532	345	33,767	2,201	173,168	5,962	392,420
Boiler-plate iron.....	29	3,096	53	8,047	41	4,589	112	13,440	126	12,674
Railroad bars and rails.....	246	17,445	96	7,167	1,416	104,054	382	25,356	1,959	101,557
Sheet, band, and hoop iron.....	43	4,816	140	13,030	66	6,068	69	11,082	98	10,068
Castings not specified.....		105,044		128,017		153,234		226,288		374,356
Car-wheels.....	2,317	42,791	4,769	99,826	7,515	137,458	11,905	189,869	6,125	122,038
Stores and parts of.....		72,132		92,337		115,792		102,308		137,859
Steam-engines, locomotive.....	38	536,746	72	953,881	58	932,655	79	1,147,366	79	996,639
Steam-engines, stationary.....	29	55,720	42	118,312	46	111,507	48	74,749	39	65,565
Boilers, separate from engines.....		54,532		178,520		232,546		127,992		119,316
Machinery not specified.....		1,515,843		2,499,744		3,120,984		3,357,909		3,073,906
Nails and spikes.....	2,503	259,324	2,225	241,429	2,998	356,990	4,039	410,850	5,536	481,177
Sawing-machines and parts of.....		1,898,864		2,436,085		2,150,720		1,594,996		1,797,929
Fire-engines and apparatus.....		40,025		12,243		12,688		19,832		21,294
All other manufactures of iron.....		2,020,271		2,398,210		3,262,170		3,303,499		3,725,985
STEEL, AND MANUFACTURES OF:										
Ingots, bars, sheets, and wire.....	8	2,538	33	8,146	9	3,955	338	26,691	64	16,830
Cutlery.....		114,142		68,030		47,346		47,162		38,080
Edge tools.....		424,831		577,831		846,432		941,016		676,933
Files and saws.....		9,282		16,884		10,171		21,496		32,134
Musket, pistols, rifles, sporting-guns.....		13,463,916		1,037,117		1,181,869		2,340,138		5,602,320
Manufactures of steel not specified.....		174,850		236,753		297,541		225,457		116,539
Total.....		\$20,943,979		\$11,195,454		\$13,283,239		\$14,794,802		\$19,204,961

DOMESTIC EXPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF FROM THE UNITED STATES TO ALL COUNTRIES DURING THE CALENDAR YEARS 1871 TO 1875.—CURRENCY VALUES.

Prepared from statistics furnished by Dr. Edward Young, Chief of the U. S. Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
IRON AND MANUFACTURES OF:										
Pig iron.....	2,330	\$67,481	1,477	\$72,818	10,103	\$414,349	16,039	\$447,619	8,738	\$250,919
Bar iron.....	179	14,830	329	31,999	367	40,404	4,717	331,341	9,548	675,465
Boiler-plate iron.....	94	3,511	33	5,041	125	14,519	122	13,219	66	6,272
Railroad bars or rails.....	333	23,813	1,212	86,820	375	30,743	1,957	73,150	1,210	67,064
Sheet, band, and hoop.....	30	3,518	165	13,781	49	7,108	86	12,284	79	8,481
Castings, not specified.....	126,459					201,409		271,276		360,170
Car-wheels.....	82,467					196,438		137,369		190,688
Stoves, and parts of.....	73,969		4,873	97,090	12,274	101,397	6,044	141,563	370	135,299
Steam-engines, locomotives.....	62	830,943	55	774,296	68	1,109,482	77	1,145,069	69	781,218
Steam-engines, stationary.....	42	105,857	40	89,556	49	125,037	41	51,296	56	84,812
Boilers, separate from engines.....	114,705					254,290		95,604		130,688
Machinery, not specified.....	1,890,880					3,011,111		4,153,238		2,966,848
Nails and spikes.....	245,289		2,682	322,879	3,409	371,663	5,139	481,010	4,897	434,743
All other manufactures of iron.....	2,191,059					3,528,941		3,279,704		3,919,087
STEEL AND MANUFACTURES OF:										
Ingots, bars, sheets, and wire.....	30	7,264	9	3,624	26	5,481	343	29,557	50	13,968
Cutlery.....	90,064					54,409		50,805		30,318
Edge-tools.....	532,395					892,096		875,538		671,123
Files and saws.....	13,222					16,520		28,173		34,279
Musket, pistols, rifles, and sporting-guns.....	5,215,128					1,548,227		3,613,430		5,184,576
All other manufactures of steel.....	207,197					236,265		167,323		229,328
AGRICULTURAL IMPLEMENTS:										
Fanning mills.....	36	1,066	25	689	120	4,330	48	1,379	146	14,863
Horse-powers.....	25	10,410	26	7,876	43	5,726	95	47,806	119	32,434
Mowers and reapers.....	3,509	377,719	6,636	765,511	9,882	1,266,761	17,230	1,886,324	13,057	1,446,681
Plows and cultivators.....	12,999	169,764	24,781	320,493	27,008	368,462	13,169	169,032	12,203	142,127
All others not specified.....	461,861					868,703		1,041,952		894,697
SCALES AND BALANCES:										
SEWING-MACHINES.....	107,516					187,380		134,996		156,246
FIRE-ENGINES AND APPARATUS.....	2,232,697					1,829,675		1,770,961		1,715,312
	9,069					26,778		16,485		12,289
Total.....		\$15,206,179		\$14,360,617		\$16,687,754		\$20,458,732		\$20,417,635

IMPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF INTO THE UNITED STATES FROM ALL COUNTRIES
DURING THE FISCAL YEARS 1871 TO 1875.—GOLD VALUES.

Prepared from statistics furnished by Dr. Edward Young, Chief of the U. S. Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.	
	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.
Pig iron.....	199,515	\$9,105,490	277,232	\$5,122,318	241,355	\$7,203,769	103,086	\$3,288,022	59,849	\$1,438,688
Castings.....	2,203	32,679	433	34,353	354	32,113	215	13,965	30	3,095
Bar iron.....	101,751	4,088,126	118,227	5,153,472	83,008	5,288,481	38,515	3,022,311	26,582	1,728,137
Boiler iron.....	849	31,254	700	57,392	12,837	35,009	77	11,177	64	9,229
Band, hoop, and acroll iron.....	11,220	596,301	11,708	573,457	12,830	846,973	3,007	200,574	429	24,062
Railroad bars or rails of iron.....	813,022	17,560,297	472,365	15,778,941	240,504	10,341,056	20,379	987,260	2,198	69,283
Railroad bars or rails of steel.....	10,488	610,809	122,335	6,277,694	160,041	9,199,666	146,410	9,771,175	44,934	2,863,027
Sheet iron.....	174,502	3,782,536	14,754	1,116,290	14,943	1,287,072	6,166	898,016	5,358	852,426
Old and scrap iron.....	14,495	204,922	288,455	6,040,678	228,567	6,643,512	57,330	1,493,142	36,306	792,136
Hardware.....	141,495	472,782	5,505	490,275	371,518	265,678	265,678	311,807	2,892	339,806
Anchor, cables, and chains of all kinds.....	907,371	711,858	1,054,045	1,693,966	675,184	437,582	1,293,774	697,060	.....	.....
Machinery.....	706,988	3,730,702	.....	822,119	.....	873,430	.....	655,204	.....	.....
Musket, pistols, rifles, and sporting guns.....	.....	1,596,331	.....	4,033,598	.....	4,155,234	.....	2,960,055	.....	.....
Steel ingots, bars, sheets, and wire.....	.....	604,153	.....	2,147,708	.....	2,234,355	.....	1,886,194	.....	.....
Cutlery.....	.....	514,346	.....	583,038	.....	770,986	.....	575,211	.....	.....
Files.....	.....	.....	.....	542,377	.....	285,637	.....	48,210	.....	.....
Saws and tools.....	.....	4,883,075	.....	5,621,882	.....	7,221,801	.....	6,153,830	.....	.....
Other manufactures of iron and steel not elsewhere specified.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	1,018,775	\$43,425,975	1,282,334	\$55,540,188	987,998	\$59,308,452	378,883	\$33,793,546	178,662	\$18,475,753

* Previous to July 1, 1871, reported under head of iron rails.

IMPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF INTO THE UNITED STATES FROM ALL COUNTRIES
DURING THE CALENDAR YEARS 1871 TO 1875.—GOLD VALUES.

Prepared from statistics furnished by Dr. Edward Young, Chief of the U. S. Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.	
	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.	Net Tons.	Values.
Pig iron.....	245,535	\$3,797,988	295,957	\$7,209,850	154,708	\$5,181,847	61,165	\$1,738,438	66,457	\$1,806,431
Casting.....	441	28,950	407	38,564	252	19,169	74	6,285	23	3,237
Bar iron.....	122,565	5,024,685	89,576	4,837,532	62,253	4,481,614	26,876	1,946,793	24,591	1,729,743
Boiler iron.....	322	27,351	684	59,993	464	44,324	53	7,669	46	7,272
Band, hoop, and scroll iron.....	13,098	594,165	12,379	748,509	8,245	537,140	1,425	91,475	228	13,596
Railroad bars or rails, of iron.....	515,000	19,132,359	381,064	14,498,019	99,201	4,708,189	7,796	393,589	1,942	67,858
Railroad bars or rails, of steel.....	50,701	1,407,786	149,786	8,207,013	159,571	8,984,103	109,486	6,838,875	16,316	1,140,402
Sheet iron.....	12,047	857,895	10,149	1,263,112	10,713	1,090,486	6,739	1,007,988	3,616	621,174
Old and scrap iron.....	239,240	4,845,000	278,357	7,617,463	108,838	3,061,759	40,746	949,942	25,856	497,682
Anchor, cables, and chains of all kinds.....	5,434	460,116	5,875	622,908	4,668	565,636	3,219	390,619	2,004	256,183
Hardware.....	.....	124,427	.....	325,208	.....	288,705	.....	803,728	.....	241,004
Machinery.....	.....	891,498	.....	1,148,713	.....	1,941,053	.....	802,570	.....	708,920
Musket, rifles, pistols, and sporting guns.....	.....	599,888	.....	811,872	.....	886,307	.....	691,990	.....	623,828
Steel ingots, bars, sheets, and wire.....	.....	3,409,733	.....	4,106,087	.....	3,865,316	.....	2,678,611	.....	2,152,203
Cutlery.....	.....	2,001,750	.....	2,272,467	.....	1,989,595	.....	1,433,570	.....	1,239,709
Files.....	.....	805,539	.....	676,814	.....	744,798	.....	430,688	.....	276,549
Saws and tools.....	.....	605,273	.....	476,927	.....	82,569	.....	32,674	.....	24,405
Other manufactures not specified.....	.....	4,754,181	.....	6,743,183	.....	7,322,099	.....	4,835,216	.....	3,863,019
Total.....	1,185,483	\$47,919,936	1,224,144	\$61,734,227	608,923	\$45,764,670	248,576	\$24,600,720	141,079	\$15,273,315

QUANTITIES AND VALUES OF PIG IRON, RAILROAD IRON, AND
OTHER ROLLED IRON IMPORTED INTO THE UNITED STATES
FROM ALL COUNTRIES FROM 1855 TO 1875.

From Statistics supplied by Dr. Edward Young, Chief of the Bureau of Statistics.

Fiscal Years	Pig Iron.		Railroad Iron.		Bar, Rod, Hoop, Sheet, and Plate Iron.	
	Gross Tons.	Dollars.	Gross Tons.	Dollars.	Gross Tons.	Dollars.
1855...	98,925	\$1,979,463	127,516	\$4,993,900	144,911	\$7,728,406
1856...	59,012	1,171,085	155,495	6,179,280	137,778	6,990,744
1857...	51,794	1,091,742	179,305	7,455,596	123,970	6,640,900
1858...	41,986	739,949	75,745	2,987,576	91,546	4,963,811
1859...	72,517	1,049,200	69,965	2,274,032	120,686	5,657,305
1860...	71,498	1,005,865	122,175	3,709,376	172,532	6,407,738
1861...	74,026	979,916	74,490	2,162,695	125,454	5,585,498
1862...	22,247	285,323	8,611	222,967	33,170	1,581,270
1863...	31,007	435,194	17,088	540,494	86,834	4,102,227
1864...	102,223	1,288,424	118,714	3,904,017	123,830	5,981,150
1865...	50,652	806,552	77,518	2,903,828	65,292	3,746,855
1866...	102,392	1,683,186	78,007	2,806,390	79,926	3,993,356
1867...	112,042	1,811,465	96,272	3,317,862	101,754	5,325,665
1868...	112,133	1,778,977	151,097	4,873,162	92,359	4,788,012
1869...	136,975	2,138,030	237,703	7,305,845	102,791	4,945,910
1870...	153,283	2,509,280	279,765	9,669,571	89,370	4,479,524
1871...	178,138	3,106,490	458,055	17,360,297	112,735	5,206,720
1872...	247,528	5,122,318	531,536	22,056,635	130,200	6,900,521
1873...	215,495	7,203,769	357,629	19,740,702	95,744	7,477,556
1874...	92,041	3,288,922	148,918	10,758,435	40,163	4,042,078
1875...	53,748	1,458,668	42,082	2,932,311	28,929	2,613,854

OUR FOREIGN COMMERCE FOR FIFTEEN YEARS.

A table, compiled from the reports of the Bureau of Statistics, of the gold value of our total imports and exports of merchandise and specie for fifteen years, beginning June 30, 1860, and ending June 30, 1875. By net imports is meant commodities retained in the country for consumption.

Fiscal Years ended June 30.	NET IMPORTS. Gold Value.		DOMESTIC EXPORTS. Gold Value.	
	Merchandise.	Specie.	Merchandise.	Specie.
1861.....	\$274,656,325	\$40,348,401	\$204,899,616	\$23,799,870
1862.....	178,330,200	10,572,063	179,644,921	31,044,651
1863.....	225,375,280	1,421,066	186,003,912	55,993,562
1864.....	301,113,322	8,192,633	143,504,027	100,473,562
1865.....	209,656,525	6,784,970	136,940,248	64,618,124
1866.....	423,470,646	7,299,395	337,518,102	82,643,571
1867.....	381,043,768	16,178,299	277,641,893	54,976,196
1868.....	344,873,435	4,150,247	269,389,900	83,745,973
1869.....	406,555,379	5,383,462	273,166,697	42,915,966
1870.....	419,803,113	12,147,315	376,616,473	43,883,802
1871.....	505,802,414	7,231,393	428,398,908	84,403,359
1872.....	610,904,622	6,664,393	435,487,131	72,798,240
1873.....	624,689,727	10,777,969	505,033,439	73,905,546
1874.....	550,556,723	21,524,187	569,433,421	59,699,686
1875.....	518,846,825	12,625,704	499,284,100	83,837,129

NOTE.—The Canadian reports of imports into Canada from the United States indicate that in addition to the above "Domestic Exports" there were exported in 1874 merchandise of the gold value of \$10,200,000, and in 1875 merchandise of the gold value of \$15,546,524.

PRICES IN DOLLARS OF AMERICAN BESSEMER STEEL RAILS, AT WORKS, FOR EIGHT YEARS, FROM 1868 TO 1875, INCLUSIVE.—TONS OF 2,240 LBS.

Compiled by The American Iron and Steel Association.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.
1868.	165	167 $\frac{1}{2}$	174	172	165	162 $\frac{1}{2}$	150	150	150	150	148	147 $\frac{1}{2}$	158 $\frac{1}{2}$
1869.	145	143 $\frac{1}{2}$	135	134	130 $\frac{1}{2}$	128	130	130	130	130 $\frac{1}{2}$	130 $\frac{1}{2}$	120	132 $\frac{1}{2}$
1870.	110	110	108 $\frac{1}{2}$	107	106	109 $\frac{1}{2}$	110	110	108 $\frac{3}{4}$	101 $\frac{1}{2}$	102 $\frac{1}{2}$	98	106 $\frac{3}{4}$
1871.	95	96	106	95	103	104	103 $\frac{1}{2}$	104	106	105 $\frac{3}{4}$	105 $\frac{1}{2}$	106 $\frac{1}{2}$	102 $\frac{1}{2}$
1872.	104 $\frac{1}{2}$	104	104 $\frac{1}{2}$	111 $\frac{1}{2}$	110	113	114 $\frac{1}{2}$	115 $\frac{1}{2}$	114	113 $\frac{1}{2}$	118	120 $\frac{1}{2}$	112
1873.	121	120	122 $\frac{1}{2}$	120 $\frac{1}{2}$	120	121 $\frac{1}{2}$	121 $\frac{1}{2}$	121 $\frac{1}{2}$	118	120	120	120	120 $\frac{1}{2}$
1874.	117 $\frac{1}{2}$	117 $\frac{1}{2}$	115	98 $\frac{1}{2}$	98 $\frac{1}{2}$	96 $\frac{1}{2}$	91	89 $\frac{1}{2}$	78 $\frac{1}{2}$	78 $\frac{1}{2}$	75 $\frac{1}{2}$	75 $\frac{1}{2}$	94 $\frac{1}{2}$
1875.	71	71	71	69	69	69	69	69	69	67	66	65	68 $\frac{1}{2}$

PRICES IN DOLLARS OF AMERICAN IRON RAILROAD BARS IN PHILADELPHIA FOR TWENTY-NINE YEARS, FROM 1847 TO 1875.—TONS OF 2,240 LBS.

Compiled by The American Iron and Steel Association.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.	Average Price of Gold.
1847...	71 $\frac{1}{2}$	70 $\frac{1}{2}$	70	70	70	70	69 $\frac{1}{2}$	69 $\frac{1}{2}$	67 $\frac{1}{2}$	67	67 $\frac{1}{2}$	67 $\frac{1}{2}$	...	100
1848...	63	63	63	63	63	63	63	61 $\frac{1}{2}$	61 $\frac{1}{2}$	61	61	61	62 $\frac{1}{2}$	100
1849...	61	57 $\frac{1}{2}$	53 $\frac{1}{2}$	53 $\frac{1}{2}$	54 $\frac{1}{2}$	53 $\frac{1}{2}$	53 $\frac{1}{2}$	53 $\frac{1}{2}$	52	51 $\frac{1}{2}$	51 $\frac{1}{2}$	51 $\frac{1}{2}$	53 $\frac{1}{2}$	100
1850...	47	47 $\frac{1}{2}$	48	49	49	50	46	46 $\frac{1}{2}$	47 $\frac{1}{2}$	48	48	48	47 $\frac{1}{2}$	100
1851...	43	44 $\frac{1}{2}$	47 $\frac{1}{2}$	45	45	48	46	45 $\frac{1}{2}$	45	45	46	46 $\frac{1}{2}$	44 $\frac{1}{2}$	100
1852...	46 $\frac{1}{2}$	46 $\frac{1}{2}$	46 $\frac{1}{2}$	46 $\frac{1}{2}$	46 $\frac{1}{2}$	46 $\frac{1}{2}$	46 $\frac{1}{2}$	47 $\frac{1}{2}$	49 $\frac{1}{2}$	51	51	48 $\frac{1}{2}$	48 $\frac{1}{2}$	100
1853...	74 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	77 $\frac{1}{2}$	100
1854...	81	81	81	81	81	81	81	81	81	81	77 $\frac{1}{2}$	73 $\frac{1}{2}$	80 $\frac{1}{2}$	100
1855...	70	65	62 $\frac{1}{2}$	62 $\frac{1}{2}$	60	58 $\frac{1}{2}$	59 $\frac{1}{2}$	59 $\frac{1}{2}$	64 $\frac{1}{2}$	65	65	63	62 $\frac{1}{2}$	100
1856...	62 $\frac{1}{2}$	62 $\frac{1}{2}$	63 $\frac{1}{2}$	65	65	65	65	65	65	65	65	64	64 $\frac{1}{2}$	100
1857...	65 $\frac{1}{2}$	65 $\frac{1}{2}$	64 $\frac{1}{2}$	65 $\frac{1}{2}$	67	67	67	67	67	67	58 $\frac{1}{2}$	59	64 $\frac{1}{2}$	100
1858...	50	50	50	50	50	50	50	50	50	50	50	50	50	100
1859...	49 $\frac{1}{2}$	49 $\frac{1}{2}$	49 $\frac{1}{2}$	50 $\frac{1}{2}$	50 $\frac{1}{2}$	50 $\frac{1}{2}$	49 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	49 $\frac{1}{2}$	100
1860...	48 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	46	47	47 $\frac{1}{2}$	47 $\frac{1}{2}$	46 $\frac{1}{2}$	48	100
1861...	44	44	44	44	44	44	44	43 $\frac{1}{2}$	43	41 $\frac{1}{2}$	36 $\frac{1}{2}$	36 $\frac{1}{2}$	42 $\frac{1}{2}$	100
1862...	36 $\frac{1}{2}$	36 $\frac{1}{2}$	41 $\frac{1}{2}$	41 $\frac{1}{2}$	41 $\frac{1}{2}$	41 $\frac{1}{2}$	41 $\frac{1}{2}$	41 $\frac{1}{2}$	43	43 $\frac{1}{2}$	46	46	41 $\frac{1}{2}$	113
1863...	72 $\frac{1}{2}$	69 $\frac{1}{2}$	72 $\frac{1}{2}$	73 $\frac{1}{2}$	73 $\frac{1}{2}$	78 $\frac{1}{2}$	81 $\frac{1}{2}$	73 $\frac{1}{2}$	72 $\frac{1}{2}$	79 $\frac{1}{2}$	87 $\frac{1}{2}$	87 $\frac{1}{2}$	76 $\frac{1}{2}$	145
1864...	94	101 $\frac{1}{2}$	105	111	120	127 $\frac{1}{2}$	141 $\frac{1}{2}$	152 $\frac{1}{2}$	153 $\frac{1}{2}$	140	133 $\frac{1}{2}$	132	1126	202
1865...	125 $\frac{1}{2}$	121 $\frac{1}{2}$	116 $\frac{1}{2}$	108 $\frac{1}{2}$	90 $\frac{1}{2}$	84 $\frac{1}{2}$	82 $\frac{1}{2}$	86 $\frac{1}{2}$	90	92 $\frac{1}{2}$	95	91	98 $\frac{1}{2}$	157
1866...	90	90	87 $\frac{1}{2}$	84 $\frac{1}{2}$	84	85 $\frac{1}{2}$	86 $\frac{1}{2}$	87	87 $\frac{1}{2}$	87 $\frac{1}{2}$	85	85	86 $\frac{1}{2}$	149
1867...	85	85	84 $\frac{1}{2}$	82 $\frac{1}{2}$	82 $\frac{1}{2}$	82 $\frac{1}{2}$	82 $\frac{1}{2}$	82 $\frac{1}{2}$	82 $\frac{1}{2}$	82 $\frac{1}{2}$	82 $\frac{1}{2}$	82 $\frac{1}{2}$	83 $\frac{1}{2}$	138
1868...	81 $\frac{1}{2}$	79	79	79	79	79	79	79	79	78 $\frac{1}{2}$	76	78 $\frac{1}{2}$	78 $\frac{1}{2}$	140
1869...	76 $\frac{1}{2}$	76	76	76	76	76	76	80	78 $\frac{1}{2}$	78 $\frac{1}{2}$	78 $\frac{1}{2}$	78 $\frac{1}{2}$	77 $\frac{1}{2}$	136
1870...	74	72 $\frac{1}{2}$	72 $\frac{1}{2}$	72 $\frac{1}{2}$	72 $\frac{1}{2}$	72 $\frac{1}{2}$	72 $\frac{1}{2}$	72 $\frac{1}{2}$	72 $\frac{1}{2}$	72 $\frac{1}{2}$	70 $\frac{1}{2}$	70	72 $\frac{1}{2}$	115
1871...	68 $\frac{1}{2}$	69	69	69 $\frac{1}{2}$	71	71	71	71	71	71	71	71	70 $\frac{1}{2}$	112
1872...	71 $\frac{1}{2}$	75 $\frac{1}{2}$	81 $\frac{1}{2}$	83 $\frac{1}{2}$	90 $\frac{1}{2}$	90	87 $\frac{1}{2}$	88 $\frac{1}{2}$	88 $\frac{1}{2}$	88 $\frac{1}{2}$	85 $\frac{1}{2}$	85 $\frac{1}{2}$	85 $\frac{1}{2}$	112
1873...	83 $\frac{1}{2}$	83	83	82	80	78	76	75	75	70	68	66	76 $\frac{1}{2}$	113
1874...	66	64	62	60	60	60	60	58	58	55	52	50	58 $\frac{1}{2}$	112
1875...	50	50	50	49	49	49	48 $\frac{1}{2}$	47	46 $\frac{1}{2}$	46	45 $\frac{1}{2}$	43 $\frac{1}{2}$	47 $\frac{1}{2}$	114

From 1847 to 1866 from Philadelphia Price Current, except for years 1850 and 1851, for which estimates were furnished by Mr. S. J. Raveau. From 1866 to 1875 from Bulletin of the American Iron and Steel Association, averaged from weekly quotations.

† Prices averaged for years to nearest eighth.

* For latter part of 1867 prices were probably only nominal. † Uncertain.

‡ Lowest month, \$60 $\frac{1}{2}$ = { November and December, 1862. } Lowest year, \$115 $\frac{1}{2}$ = 1862.

§ Highest month, \$103 $\frac{1}{2}$ = January and February, 1862. ¶ Highest year, \$120 = 1864.

|| Highest month, \$103 $\frac{1}{2}$ = September, 1864.

⦿ The annual premium on gold is calculated from daily quotations of gold sales in the Bankers' Magazine.

PRICES IN DOLLARS IN PHILADELPHIA OF No. 1 ANTHRACITE
FOUNDRY PIG IRON FROM 1842 TO 1875.—Tons of 2,240 LBS.

Compiled by The American Iron and Steel Association.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.*	Year.
1842.....					27	27	26 $\frac{1}{2}$	24 $\frac{1}{2}$	25 $\frac{1}{2}$	25	25	25	.....	1842
1844.....	24	24	24	24	24	26 $\frac{1}{2}$	26 $\frac{1}{2}$	26 $\frac{1}{2}$	27 $\frac{1}{2}$	28	27 $\frac{1}{2}$	26 $\frac{3}{4}$	25 $\frac{3}{4}$	1844
1845.....	26 $\frac{3}{4}$	27 $\frac{3}{4}$	27 $\frac{3}{4}$	33 $\frac{1}{2}$	34 $\frac{1}{2}$	33	31	28 $\frac{1}{2}$	27	26 $\frac{3}{4}$	28 $\frac{1}{2}$	28	29 $\frac{1}{2}$	1845
1846.....	28	28	28 $\frac{1}{2}$	28	28 $\frac{1}{2}$	28	29	26 $\frac{1}{2}$	27 $\frac{1}{2}$	27	28 $\frac{1}{2}$	28 $\frac{1}{2}$	27 $\frac{3}{4}$	1846
1847.....	28 $\frac{1}{2}$	28 $\frac{1}{2}$	28 $\frac{1}{2}$	29	29	28 $\frac{1}{2}$	28	28 $\frac{1}{2}$	30 $\frac{1}{2}$	33 $\frac{3}{4}$	35 $\frac{3}{4}$	33 $\frac{3}{4}$	30 $\frac{1}{2}$	1847
1848.....	31	28 $\frac{1}{2}$	27 $\frac{1}{2}$	26 $\frac{3}{4}$	26 $\frac{1}{2}$	25 $\frac{3}{4}$	25 $\frac{3}{4}$	25 $\frac{1}{2}$	25 $\frac{1}{2}$	25	25	24 $\frac{3}{4}$	26 $\frac{1}{2}$	1848
1849.....	25	24 $\frac{1}{2}$	24 $\frac{1}{2}$	24	23 $\frac{1}{2}$	23	22 $\frac{3}{4}$	22 $\frac{1}{2}$	21 $\frac{1}{2}$	21 $\frac{1}{2}$	20	21	22 $\frac{3}{4}$	1849
1850.....	21	21	20 $\frac{3}{4}$	20 $\frac{3}{4}$	20 $\frac{3}{4}$	20 $\frac{1}{2}$	20	20 $\frac{5}{8}$	21	21	21	21 $\frac{3}{4}$	20 $\frac{3}{4}$	1850
1851.....	21 $\frac{1}{2}$	22	22	22	21 $\frac{1}{2}$	21 $\frac{1}{2}$	21	21	21	21	21	21	21 $\frac{3}{8}$	1851
1852.....	21 $\frac{1}{2}$	21 $\frac{1}{2}$	20 $\frac{3}{4}$	20 $\frac{3}{4}$	20 $\frac{1}{2}$	20 $\frac{1}{2}$	20 $\frac{1}{2}$	21 $\frac{1}{2}$	23 $\frac{1}{2}$	26 $\frac{1}{2}$	27 $\frac{3}{4}$	28 $\frac{1}{2}$	22 $\frac{3}{4}$	1852
1853.....	32 $\frac{3}{4}$	36 $\frac{3}{4}$	35 $\frac{3}{4}$	35 $\frac{3}{4}$	35 $\frac{3}{4}$	36	36	36	37 $\frac{1}{2}$	37 $\frac{1}{2}$	36 $\frac{3}{4}$	36 $\frac{3}{4}$	36 $\frac{3}{4}$	1853
1854.....	37	36 $\frac{1}{2}$	37	38	38	38	38	38	37 $\frac{3}{4}$	36 $\frac{1}{2}$	35 $\frac{1}{2}$	32 $\frac{3}{4}$	36 $\frac{3}{4}$	1854
1855.....	31 $\frac{1}{2}$	29 $\frac{1}{2}$	27 $\frac{1}{2}$	26 $\frac{3}{4}$	26 $\frac{1}{2}$	26 $\frac{1}{2}$	26 $\frac{1}{2}$	27	27	26 $\frac{3}{4}$	26	26	27 $\frac{1}{2}$	1855
1856.....	27 $\frac{1}{2}$	27 $\frac{1}{2}$	27 $\frac{1}{2}$	28	28	27 $\frac{1}{2}$	27	27	27	26 $\frac{3}{4}$	26	26	27 $\frac{1}{2}$	1856
1857.....	26 $\frac{1}{2}$	26 $\frac{1}{2}$	26 $\frac{1}{2}$	27 $\frac{1}{2}$	27 $\frac{1}{2}$	27 $\frac{1}{2}$	27 $\frac{1}{2}$	26 $\frac{3}{4}$	26 $\frac{3}{4}$	23 $\frac{1}{2}$	23 $\frac{1}{2}$	23 $\frac{1}{2}$	26 $\frac{3}{4}$	1857
1858.....	23 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	21 $\frac{1}{2}$	22	21	22	21 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	1858
1859.....	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	1859
1860.....	23	23	23 $\frac{1}{2}$	23 $\frac{1}{2}$	23 $\frac{1}{2}$	23 $\frac{1}{2}$	23 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	22 $\frac{1}{2}$	1860
1861.....	22 $\frac{1}{2}$	21 $\frac{1}{2}$	21 $\frac{1}{2}$	21 $\frac{1}{2}$	21 $\frac{1}{2}$	20 $\frac{1}{2}$	20 $\frac{1}{2}$	18 $\frac{1}{2}$	18 $\frac{1}{2}$	18 $\frac{1}{2}$	18 $\frac{1}{2}$	19 $\frac{1}{2}$	20 $\frac{1}{2}$	1861
1862.....	20	20 $\frac{3}{4}$	20 $\frac{3}{4}$	21 $\frac{1}{2}$	21 $\frac{1}{2}$	21 $\frac{1}{2}$	24	24 $\frac{1}{2}$	24 $\frac{1}{2}$	25 $\frac{1}{2}$	30 $\frac{1}{2}$	31 $\frac{1}{2}$	23 $\frac{1}{2}$	1862
1863.....	32	33 $\frac{1}{2}$	35 $\frac{1}{2}$	36	34 $\frac{1}{2}$	33 $\frac{1}{2}$	32 $\frac{1}{2}$	33	33	35 $\frac{1}{2}$	41 $\frac{1}{2}$	43 $\frac{1}{2}$	35 $\frac{1}{2}$	1863
1864.....	43 $\frac{1}{2}$	48 $\frac{1}{2}$	50 $\frac{1}{2}$	54 $\frac{1}{2}$	57 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{2}$	61 $\frac{1}{2}$	72 $\frac{1}{2}$	68 $\frac{1}{2}$	61 $\frac{1}{2}$	59 $\frac{1}{2}$	59 $\frac{1}{2}$	1864
1865.....	58 $\frac{1}{2}$	53 $\frac{1}{2}$	50 $\frac{1}{2}$	45 $\frac{1}{2}$	39 $\frac{1}{2}$	35	33 $\frac{1}{2}$	40 $\frac{1}{2}$	44 $\frac{1}{2}$	49 $\frac{1}{2}$	51	50 $\frac{1}{2}$	46 $\frac{1}{2}$	1865
1866.....	50 $\frac{1}{2}$	49	46 $\frac{1}{2}$	41 $\frac{1}{2}$	41 $\frac{1}{2}$	43 $\frac{1}{2}$	46 $\frac{1}{2}$	47 $\frac{1}{2}$	48 $\frac{1}{2}$	48 $\frac{1}{2}$	49 $\frac{1}{2}$	49 $\frac{1}{2}$	46 $\frac{1}{2}$	1866
1867.....	48 $\frac{1}{2}$	46 $\frac{1}{2}$	44 $\frac{1}{2}$	41	42 $\frac{1}{2}$	43	43 $\frac{1}{2}$	44	44 $\frac{1}{2}$	44 $\frac{1}{2}$	43 $\frac{1}{2}$	42 $\frac{1}{2}$	44 $\frac{1}{2}$	1867
1868.....	38 $\frac{1}{2}$	36 $\frac{1}{2}$	37 $\frac{1}{2}$	38 $\frac{1}{2}$	37	37	38 $\frac{1}{2}$	39 $\frac{1}{2}$	40 $\frac{1}{2}$	41 $\frac{1}{2}$	42 $\frac{1}{2}$	43 $\frac{1}{2}$	39 $\frac{1}{2}$	1868
1869.....	42	40 $\frac{1}{2}$	41 $\frac{1}{2}$	40	39 $\frac{1}{2}$	40 $\frac{1}{2}$	41 $\frac{1}{2}$	41 $\frac{1}{2}$	40 $\frac{1}{2}$	40 $\frac{1}{2}$	39 $\frac{1}{2}$	39 $\frac{1}{2}$	40 $\frac{1}{2}$	1869
1870.....	36 $\frac{1}{2}$	34 $\frac{1}{2}$	34 $\frac{1}{2}$	33 $\frac{1}{2}$	33 $\frac{1}{2}$	32 $\frac{1}{2}$	32 $\frac{1}{2}$	33 $\frac{1}{2}$	33 $\frac{1}{2}$	32 $\frac{1}{2}$	31 $\frac{1}{2}$	31 $\frac{1}{2}$	33 $\frac{1}{2}$	1870
1871.....	30 $\frac{1}{2}$	30 $\frac{1}{2}$	34 $\frac{1}{2}$	35 $\frac{1}{2}$	35 $\frac{1}{2}$	35	35 $\frac{1}{2}$	36	36 $\frac{1}{2}$	36 $\frac{1}{2}$	37 $\frac{1}{2}$	37 $\frac{1}{2}$	35 $\frac{1}{2}$	1871
1872.....	37	40 $\frac{1}{2}$	47	49 $\frac{1}{2}$	49 $\frac{1}{2}$	53 $\frac{1}{2}$	51 $\frac{1}{2}$	52 $\frac{1}{2}$	53 $\frac{1}{2}$	53 $\frac{1}{2}$	47 $\frac{1}{2}$	47 $\frac{1}{2}$	48 $\frac{1}{2}$	1872
1873.....	45 $\frac{1}{2}$	48	48 $\frac{1}{2}$	47 $\frac{1}{2}$	46	45	43 $\frac{1}{2}$	43 $\frac{1}{2}$	42 $\frac{1}{2}$	38	33	32 $\frac{1}{2}$	42 $\frac{1}{2}$	1873
1874.....	32	32	32	31 $\frac{1}{2}$	31 $\frac{1}{2}$	31 $\frac{1}{2}$	31 $\frac{1}{2}$	31	29 $\frac{1}{2}$	29	26 $\frac{1}{2}$	24	30 $\frac{1}{2}$	1874
1875.....	25 $\frac{1}{2}$	26 $\frac{1}{2}$	27	27	26	26	26	26	26	24	23 $\frac{1}{2}$	23 $\frac{1}{2}$	25 $\frac{1}{2}$	1875

* Average for year to nearest eighth.

† Lowest average for month, \$18 $\frac{1}{2}$ —October, 1861.

‡ Lowest average for year, \$20 $\frac{1}{4}$ —1861.

§ Uncertain.

§ Highest average for month, \$75 $\frac{1}{2}$ —August, 1864.

¶ Highest average for year, \$59 $\frac{1}{2}$ —1864.

|| From 1862 to July, 1865, averaged monthly from weekly quotations in Philadelphia and New York prices current. From July, 1865, to 1875, averaged from weekly quotations in Bulletin of the American Iron and Steel Association.

IRON AND STEEL PRODUCT OF PITTSBURGH AND ALLEGHENY
COUNTY, PENNA., IN 1874 AND 1875.

Statistics procured by The American Iron and Steel Association from the manufacturers.

Years.	Number of Rolling Mills.	Product of Rails, Bar, Angle, Bolt, Rod, and Hoop. Net tons.	Product of Sheet and Plate. Net tons.	Product of Nails. Kegs.	Total Rolled Iron, including Nails. Net tons.
1874.....	31	194,114	52,361	562,995	274,625
1875.....	32	177,733	45,773	442,359	245,624

Years.	Number of blast furnaces.	Make of Pig Iron. Net tons.	Number of Steel Works.	Make of Crucible Steel. Net tons.	Make of Blister German, and Open-hearth Steel. Net tons.	Total make of Steel. Net tons.
1874.....	11	143,660	10*	17,915	6,000	23,915
1875.....	11	131,856	13*	22,942	6,800	29,802

* Bessemer steel not included, but four of these works are also iron rolling-mills.

AVERAGE COST IN DOLLARS PER GROSS TON OF ANTHRACITE PIG IRON, 1850 TO 1875.—RUN OF THE FURNACE.

Compiled from original data by Mr. William E. S. Baker, Secretary of The Eastern Iron Masters' Association.

	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.
Ore.....	5.55	5.44	5.55	5.97	6.65	7.51	7.50	7.75	7.66	7.08	7.45	7.35	7.08	7.40	9.12	13.13	12.19	11.71	10.92	11.86	12.96	12.67	13.64	14.87	12.35	10.82	9.33
Coal.....	3.70	3.36	3.65	3.23	3.53	4.03	3.90	3.89	4.06	3.26	3.49	3.26	3.68	3.42	5.41	9.66	7.65	7.44	7.11	7.41	7.08	8.60	7.28	7.45	7.64	7.21	5.42
Limestone.....	93	96	1.09	1.06	1.38	1.26	1.16	1.14	1.18	1.15	1.21	1.17	1.11	1.20	1.93	2.85	2.65	2.76	2.51	2.14	2.44	2.08	2.04	1.98	1.77	1.61	1.62
Labor.....	2.22	1.61	2.02	2.00	2.45	2.85	2.58	2.39	2.10	1.82	1.87	1.97	1.57	2.07	2.85	4.56	3.46	3.99	3.86	3.46	3.89	3.54	4.69	5.11	3.42	2.57	2.88
Contingencies.....	1.65	1.93	2.03	2.62	1.99	2.62	2.91	2.16	2.73	2.83	2.83	2.86	2.67	2.35	1.66	2.01	2.03	1.98	1.90	1.96	3.67	2.77	2.93	3.00	2.16	1.86	2.39
Cost at furnace.....	14.25	13.30	14.34	14.88	16.00	18.87	18.05	17.24	17.73	16.14	16.85	16.61	16.11	16.53	20.97	32.21	27.88	27.83	26.30	26.83	30.04	29.65	30.58	32.41	27.84	25.49	21.64
Interest.....	1.05	1.05	1.15	1.22	1.37	1.29	1.21	1.47	1.22	1.28	1.36	1.57	1.57	1.40	1.59	1.61	1.64	1.80	1.63	1.71	1.85	1.82	1.76	2.08	1.91	1.62	1.51
Total cost.....	15.30	14.35	15.49	16.10	17.37	20.16	19.26	18.71	18.95	17.42	18.21	18.18	17.68	17.93	22.56	33.82	29.52	29.65	27.93	28.54	31.89	31.47	32.33	34.49	29.25	26.11	23.15

AVERAGE COST IN DOLLARS PER GROSS TON OF MERCHANT BAR IRON IN MILL, 1850 TO 1875.

Pig iron.....	25.65	24.90	25.71	25.42	17.42	64.32	84.33	34.39	61.20	54.25	61.25	35.24	36.27	90.41	40.68	60.50	77.50	64.44	53.43	29.43	63.40	50.40	11.43	24.34	56.27	26.36	55
Coal.....	5.70	5.61	5.61	5.81	6.00	8.28	6.59	6.60	5.40	5.17	5.27	5.39	6.19	7.66	8.44	13.03	8.92	9.13	8.64	8.33	8.55	7.55	8.43	8.55	7.94	8.14	7.30
Labor.....	10.43	10.17	10.37	11.06	15.12	14.70	12.85	13.05	11.77	10.68	10.90	11.21	11.78	15.14	18.94	27.45	20.61	22.02	20.65	18.57	17.70	21.55	20.37	15.82	15.69	15.71	71
Contingencies.....	4.64	4.83	4.88	7.05	10.39	10.78	8.88	10.38	10.84	7.91	8.78	8.71	10.03	7.66	9.15	18.03	11.90	9.44	7.76	7.75	7.03	7.85	5.74	5.83	5.39	4.38	8.29
Cost in mill.....	46.42	45.51	46.57	49.17	73.68	76.40	61.66	78.58	71.50	59.50	56.50	57.62	58.36	77.93	127.11	131.91	80.91	23.80	74.80	62.77	78.73	62.84	83.77	99.03	64.53	47.67	85
Interest.....	1.56	1.49	1.54	1.59	1.80	1.63	1.59	1.89	1.65	1.60	1.71	1.90	1.75	1.77	1.80	2.89	2.01	2.03	1.96	2.00	2.15	2.20	2.22	2.25	1.87	1.75	1.87
Total cost.....	47.98	47.00	48.11	50.77	75.48	78.03	63.25	80.47	73.15	61.10	58.21	59.52	60.11	79.70	129.91	134.72	82.92	25.82	76.82	64.82	80.93	85.03	86.00	101.64	66.38	49.52	87

Quantity of ore used to make one ton of pig iron, average of 20 years..... gross tons, 2.17 0.22

Quantity of coal used to make one ton of pig iron, average of 20 years..... " 2.03 0.05

Quantity of limestone used to make one ton of pig iron, average of 20 years..... " 1.04 0.02

The above group of furnaces used Juchite and Melrose formation ore and a little Cornwall. The coal came chiefly from the Wyoming and Lehigh valleys.

Quantity of pig iron used to make one ton of finished bar iron, average of 16 years..... gross tons, 1.06 0.00

Quantity of coal used to make one ton of finished bar iron, average of 16 years..... " 1.16 0.19

The above rolling mills used gray forge pig iron and Bessemer Top and Cumberland coal.

The iron for interest is computed on the capital in a product of 6,000 tons.

MISCELLANEOUS STATISTICS.

THE following statistics have been compiled expressly for this report, and are of interest to iron and steel manufacturers.

UNITED STATES RAILWAY STATISTICS FOR 1875.

From advance statistics furnished us by H. V. Poor, Esq., editor of Poor's *Manual of the Railroads of the United States*, we obtain the following table of the progress of railway construction in this country to January 1, 1876:

Year.	Miles in Operation.	Annual Incr'se of Mileage.	Year.	Miles in Operation.	Annual Incr'se of Mileage.	Year.	Miles in Operation.	Annual Incr'se of Mileage.
1830....	23	...	1846....	4,930	297	1862....	32,120	834
1831....	93	72	1847....	5,598	668	1863....	33,170	1,050
1832....	229	134	1848....	5,996	398	1864....	33,908	738
1833....	380	151	1849....	7,365	1,369	1865....	35,085	1,177
1834....	633	253	1850....	9,021	1,656	1866....	36,827	1,742
1835....	1,098	465	1851....	10,982	1,961	1867....	39,276	2,449
1836....	1,273	175	1852....	12,908	1,926	1868....	42,255	2,979
1837....	1,497	224	1853....	15,360	2,452	1869....	47,208	4,953
1838....	1,913	416	1854....	16,720	1,360	1870....	52,898	5,690
1839....	2,302	389	1855....	18,374	1,654	1871....	60,568	7,670
1840....	2,818	516	1856....	22,016	3,642	1872....	66,735	6,167
1841....	3,535	717	1857....	24,503	2,487	1873....	70,840	4,105
1842....	4,026	491	1858....	26,368	2,465	1874....	72,741	1,901
1843....	4,185	159	1859....	28,789	1,821	1875....	74,658	1,917
1844....	4,377	192	1860....	30,635	1,846	.....	.....	.....
1845....	4,633	256	1861....	31,286	651	.....	.....	.....

The close correspondence of the mileage of 1875 with that of 1874 will not escape notice. For 1876 there is a hopeful promise of an increased mileage over that of 1875. The *Railroad Gazette*, of New York, in its issue for July 21, 1876, had information of the laying of 846 miles of track on new railroads in 1876, against 457 miles reported for the same period in 1875, 727 in 1874, and 1,578 in 1873.

Mr. Poor writes us that the figures given in his table denote the length of the railroad lines of the country, without regard to the number of tracks or miles of sidings constructed. He estimates that there are no less than 16,000 miles of railroad in double, treble, and quadruple tracks, sidings, etc., which would make the total length of single track equal to 90,658 miles on the 1st of January, 1876.

Mr. Howard Fleming, author of *Narrow-gauge Railways in America*, states that the total mileage of narrow-gauge railways in the United States and British America on the 1st of February,

1876, inclusive of sidings, was 2,687, of which 585 miles were built in 1875—480 in the United States and 105 in British America.

In the month of June, 1876, a railway trip "across the continent," from the Atlantic to the Pacific ocean, was completed in the remarkably short time of 83 hours 59 minutes and 16 seconds—less than three and a half days. The following record of this unequalled achievement is worthy of preservation :

Left Jersey City, on the west bank of the Hudson river, opposite New York City, at 12.53 A. M., railroad time, June 1st, by way of the Pennsylvania Railroad and its connections; arrived at Pittsburgh at 10.58 A. M. same day; Chicago, at 10 P. M. same day; Council Bluffs, at 10 A. M. on 2d inst.; Ogden, at 10.30 A. M. on 3d inst.; and San Francisco, at 9.29 A. M. 4th inst., or 12 o'clock 32 minutes, New York time.

Distance from New York to San Francisco, miles.....	3,317
Number of hours from New York to San Francisco.....	83 h. 59 m. 16 s.
Average speed per hour, miles.....	39 $\frac{2}{3}$
Distance from New York to Pittsburgh, run without a single stop, miles.....	444
Number of hours from New York to Pittsburgh.....	10 h. 5 m.
Average speed per hour, miles.....	44
Maximum speed on Pennsylvania Railroad per hour, miles.....	62
Minimum speed on Pennsylvania Railroad per hour, miles.....	25
Average speed on Pittsburgh, Ft. Wayne and Chicago Railway per hour, miles.....	48
Average speed on Chicago and Northwestern Railway per hour, miles	45

IMMIGRATION INTO THE UNITED STATES FROM 1861 TO 1875.

The statistics of immigration into the United States during the past fifteen years are given below. They possess interest for the political economist who endeavors to ascertain all the causes of our late financial revulsion, and whose faith in his own powers of divination may lead him to foretell the time when general prosperity will again return.

Calendar Years.	Number of Immigrants.	Calendar Years.	Number of Immigrants.	Calendar Years.	Number of Immigrants.
1861.....	89,720	1866.....	314,840	1871.....	346,938
1862.....	89,005	1867.....	293,601	1872.....	437,750
1863.....	174,523	1868.....	289,145	1873.....	422,545
1864.....	193,191	1869.....	385,287	1874.....	260,814
1865.....	248,394	1870.....	356,303	1875.....	191,231

Statistics of immigration, from the foundation of the government to the present time, will be found elsewhere in this report.

STATISTICS OF COAL PRODUCTION IN THE UNITED STATES IN 1874 AND 1875.

Elsewhere we present full statistics of the production in this country of Pennsylvania anthracite and Cumberland bituminous coal for a long series of years, together with the prices at which they have been sold. Through the laborious exertions of R. P. Rothwell, Esq., editor of *The Engineering and Mining Journal*, of New York, we are enabled to state that the production in the United States of *all* kinds of coal in 1874 was, in round numbers, 46,500,000 gross tons, of which 21,679,886 were anthracite coal, and the remainder bituminous coal, including lignite.

A letter written to us by Mr. Rothwell June 26th states that the total production of anthracite coal in the United States in 1875 was 20,643,509 gross tons. The production of bituminous coal in 1875 had not then been ascertained, but was estimated to have been 25,000,000 gross tons. All these are large aggregates for so dull a year as 1875. Mr. Rothwell will soon publish detailed statistics of the entire coal production of this country in recent years.

Our imports and exports of coal about balance each other, each amounting to about half a million of tons annually.

THE WORLD'S PRODUCTION OF IRON AND COAL.

We present below a table, compiled from authentic sources of information, showing the production in recent years of cast or pig iron in the various iron-producing countries of the world.

CAST OR PIG IRON BY COUNTRIES.	Year.	Gross tons.	Per cent. of total.
Great Britain.....	1874	5,991,408	44.95
United States.....	1875	2,023,733	15.18
Germany.....	1874	1,750,000	13.13
France.....	1875	1,415,728	10.62
Belgium.....	1874	613,656	4.60
Austria and Hungary.....	1874	400,000	3.00
Russia.....	1873	417,654	3.13
Sweden.....	1874	322,139	2.42
Luxembourg.....	1872	184,573	1.38
Italy.....	1872	26,000	.20
Spain.....	1870	53,112	.40
Norway.....	1870	3,912	.03
South America and Mexico.....	.....	15,000	.11
Canada.....	.....	10,000	.08
Japan.....	1871	9,370	.07
Switzerland.....	1872	7,500	.06
Turkey in Europe.....	.....	25,000	.19
All other countries.....	.....	60,000	.45
Total.....	.....	13,328,785	100.00

We also give another table, compiled from reliable sources, showing the production of mineral coal by all countries in late years.

MINERAL COAL BY COUNTRIES.	Year.	Gross tons.	Per cent. of total.
Great Britain.....	1875	133,306,485	48.83
United States.....	1874	46,500,000	17.03
Germany.....	1873	45,645,193	16.72
France.....	1875	16,949,031	6.21
Belgium.....	1874	14,407,082	5.28
Austria and Hungary.....	1872	10,388,952	3.81
Russia.....	1874	1,346,900	.49
Nova Scotia.....	1875	781,165	.29
New South Wales.....	1874	1,298,400	.47
Spain.....	1873	570,000	.21
India.....	1868	547,971	.20
Turkey in Europe and Asia.....	.....	250,000	.09
Chili, China, Japan, New Zealand, and all other countries.....	.....	1,000,000	.37
Total.....	.....	272,992,179	100.00

PRODUCTION OF PIG IRON AND COAL BY GREAT BRITAIN IN RECENT YEARS.

The production of pig iron in the United Kingdom of Great Britain and Ireland from 1854 to 1874 is given below, from official statistics.

Year.	Gross tons.	Year.	Gross tons.
1854.....	3,069,838	1865.....	4,819,254
1855.....	3,218,151	1866.....	4,523,897
1856.....	3,586,377	1867.....	4,761,023
1857.....	3,659,477	1868.....	4,970,206
1858.....	3,456,064	1869.....	5,445,757
1859.....	3,712,904	1870.....	5,963,515
1860.....	3,826,752	1871.....	6,627,179
1861.....	3,712,390	1872.....	6,741,929
1862.....	3,943,469	1873.....	6,566,451
1863.....	4,510,040	1874.....	5,991,408
1864.....	4,767,901		

The production of mineral coal in the United Kingdom of Great Britain and Ireland from 1854 to 1875 is given as follows by Mr. Robert Hunt, Keeper of Mining Records, except for 1875, which is taken from the reports of the Inspectors of Mines for that year.

Year.	Gross tons.	Year.	Gross tons.
1854.....	64,661,401	1865.....	98,150,587
1855.....	61,453,979	1866.....	101,630,544
1856.....	66,645,450	1867.....	104,500,480
1857.....	65,394,707	1868.....	103,141,157
1858.....	65,008,649	1869.....	107,427,557
1859.....	71,979,765	1870.....	110,431,192
1860.....	80,042,698	1871.....	117,352,028
1861.....	83,635,214	1872.....	123,497,316
1862.....	81,638,338	1873.....	127,016,747
1863.....	86,292,215	1874.....	125,043,257
1864.....	92,787,873	1875.....	133,306,485

THE BRITISH IRON EXPORT TRADE FOR THE CALENDAR YEARS 1871 TO 1875.

From the British Board of Trade Returns. Tons of 2,240 pounds.

PRINCIPAL ARTICLES ONLY TO ALL COUNTRIES.	QUANTITIES IN TONS.					VALUES IN POUNDS STERLING.				
	1871.	1872.	1873.	1874.	1875.	1871.	1872.	1873.	1874.	1875.
Pig iron.....	1,057,458	1,331,143	1,142,065	776,116	954,476	3,229,408	6,712,579	7,118,037	3,673,734	3,474,621
Bar, angle, bolt, and rod.....	349,084	313,609	286,845	258,933	276,686	2,921,777	3,632,818	3,705,989	3,054,547	2,729,833
Railroad of all sorts.....	981,197	945,429	785,014	782,665	546,547	8,084,619	10,225,492	10,418,852	9,638,236	5,459,898
Wire of iron and steel (except telegraph), galvanized or not.....	26,200	32,540	29,445	36,692	43,077	446,159	672,914	692,470	769,927	781,073
Hoops, sheets, boiler and armor plates.....	200,337	207,495	201,570	168,430	204,480	2,399,203	3,414,906	3,722,889	2,975,409	3,303,121
Tinned plates.....	119,606	118,083	120,638	122,960	138,563	2,900,625	3,800,976	3,953,042	3,714,810	3,691,382
Cast or wrought, and all other manufactures (except ordnance) unenumerated.....	243,298	209,607	282,000	257,069	240,041	3,588,364	4,772,364	5,478,769	5,122,588	4,342,615
Iron, old, for remanufacture.....	139,812	107,521	60,339	43,141	20,994	672,606	656,262	399,522	245,381	100,012
Steel, unwrought.....	39,189	44,069	39,418	31,440	29,733	1,198,428	1,478,737	1,462,837	1,203,719	1,070,446
Manufactures of steel, or steel and iron combined.....	13,038	11,384	10,479	10,056	11,044	682,855	623,122	728,831	791,905	828,420
Total of iron and steel.....	3,169,219	3,383,762	2,937,813	2,487,522	2,465,640	26,124,134	35,906,167	37,731,239	31,190,256	25,781,421
Steam-engines.....	.....	.....	.....	.....	.....	2,064,004	2,594,996	2,927,617	3,253,685	2,620,491
Other machinery and mill-work.....	.....	.....	.....	.....	.....	3,902,037	5,606,116	7,092,312	6,330,229	6,478,222

TO THE UNITED STATES (INCLUDED IN THE ABOVE).

Pig iron.....	190,183	193,151	102,624	43,568	49,868	594,086	1,017,123	603,694	213,979	191,141
Bar, angle, bolt, and rod.....	64,301	64,583	22,676	4,729	3,264	534,205	745,681	508,226	74,064	53,698
Railroad of all sorts.....	512,277	467,394	196,300	11,267	6,963	3,976,857	4,812,866	2,414,135	147,970	65,881
Hoops, sheets, boiler and armor plates.....	11,529	31,497	18,272	8,351	11,023	409,686	427,603	303,584	131,388	138,553
Cast or wrought, unenumerated.....	10,671	13,468	22,571	26,058	7,818	180,015	306,751	413,387	352,022	143,668
Steel, unwrought.....	21,133	23,821	19,329	13,562	10,581	620,537	707,838	707,635	503,058	382,667
Total.....	840,085	795,734	371,782	101,545	89,917	6,315,376	8,081,682	4,890,661	1,422,481	977,608

PRICES OF BRITISH IRON FOR FIVE YEARS.

Average Prices, per ton of 2,240 pounds, of Scotch Pig Iron, f. o. b. at Glasgow; Staffordshire Bar Iron at works, and Welsh Rails at works.

Procured from authentic British sources.

MONTH.	Scotch Pig Iron. Mixed Numbers.					Bar Iron. Best Staffordshire.					Welsh Rails.				
	1871.	1872.	1873.	1874.	1875.	1871.	1872.	1873.	1874.	1875.	1871.	1872.	1873.	1874.	1875.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Jan.....	51 6	74 7	129 6	106 1	74 4	160 0	200 0	240 0	280 0	200 0	155 0	175 0	215 0	210 0	150 0
Feb.....	52 3	75 8	138 3	94 9	73 6	160 0	220 0	260 0	280 0	200 0	125 0	180 0	215 0	202 0	140 0
March.....	53 7	85 8	132 0	87 2	73 3	160 0	240 0	300 0	280 0	200 0	125 0	180 0	220 0	189 5	140 0
April.....	55 1	92 0	118 0	75 9	68 6	160 0	240 0	300 0	270 0	197 6	130 0	200 0	240 0	185 6	140 0
May.....	56 8	95 1	115 3	85 8	64 3	160 0	240 0	300 0	270 0	197 6	130 0	210 0	240 0	170 0	140 0
June.....	57 0	99 6	111 6	94 6	59 3	160 0	250 0	300 0	260 0	197 6	130 0	210 0	230 0	160 0	140 0
July.....	59 0	121 9	109 6	81 3	60 3	160 0	290 0	280 0	241 3	185 0	135 0	215 0	230 0	157 6	140 0
August.....	62 0	126 0	109 9	85 8	63 3	160 0	310 0	280 0	241 3	185 0	135 0	215 0	210 0	155 0	140 0
Sept.....	60 7	129 2	115 6	83 9	65 8	170 0	310 0	280 0	261 3	185 0	135 0	220 0	210 0	148 2	140 0
October.....	61 8	120 8	113 9	84 6	62 0	170 0	270 0	280 0	236 3	188 0	135 0	220 0	210 0	147 6	135 0
Nov.....	67 9	97 7	107 8	83 3	61 3	170 0	230 0	280 0	226 3	200 0	135 0	220 0	210 0	145 0	130 0
Dec.....	70 0	107 0	106 3	83 6	63 6	180 0	230 0	280 0	220 0	200 0	140 0	200 0	210 0	140 0	125 0
Average	58 11	102 0	117 3	87 4	63 9	164 2	252 6	281 8	255 6	194 7	134 2	203 9	220 0	167 7	138 4

PRICES OF CUMBERLAND COAL FOR TWENTY-THREE YEARS.

Average Price in Dollars, per ton of 2,240 pounds, of Cumberland Coal, delivered on board vessel at Baltimore, Md., from 1853 to 1875, together with the average freight to Boston.

Prepared for The American Iron and Steel Association by ISRAEL W. MORRIS, of Philadelphia, and Messrs. BORDEN & LOVELL, of New York.

Year	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average for year.	Average freight to Boston.	Average cost delivered in Boston.
1853.	.....	.....	.....	.....	3.15	.....	3.15	3.15	.....	3.15	3.62	3.50	.....	2.80	.....
1854.	3.50	.....	.....	.....	.....	.....	.....	4.00	4.25	.....	4.25	4.25	.....	2.25	.....
1855.	4.25	4.25	4.25	4.00	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.89	2.17	6.06
1856.	.....	.....	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	.....	3.75	2.37	6.12
1857.	4.35	4.35	4.35	4.50	4.28	4.24	4.23	4.15	4.23	4.25	4.25	4.25	4.28	1.84	6.12
1858.	.....	.....	3.80	3.75	3.50	3.73	3.62	3.75	3.62	3.75	3.75	3.75	3.70	1.73	5.43
1859.	4.12	3.75	3.37	3.18	4.07	3.65	3.45	3.93	3.42	3.55	3.55	3.55	3.63	1.83	5.46
1860.	.....	3.50	3.75	3.45	3.37	3.50	.....	.....	.....	3.50	3.25	3.50	3.47	2.55	6.02
1861.	3.00	3.66	3.42	3.50	3.50	3.50	3.50	.....	.....	.....	.....	.....	3.44	2.25	5.69
1862.	.....	.....	4.00	4.00	4.25	4.11	4.33	4.25	.....	.....	.....	.....	4.16	2.42	6.58
1863.	5.50	6.00	6.00	5.66	5.50	5.50	5.50	5.50	5.25	5.50	5.50	5.57	5.57	3.28	8.85
1864.	5.75	5.75	5.83	6.00	6.14	6.21	.....	7.41	.....	8.36	8.36	8.63	6.84	3.39	10.23
1865.	8.56	.....	10.25	9.01	8.00	6.50	6.75	7.00	7.00	6.75	6.75	7.57	7.57	3.79	11.36
1866.	6.35	7.00	6.00	6.00	6.00	6.00	5.75	5.65	5.62	5.66	5.62	5.66	5.94	3.53	9.47
1867.	.....	.....	5.25	5.13	5.08	4.88	4.92	4.88	4.92	4.88	4.88	4.88	4.97	2.68	7.65
1868.	5.00	5.00	4.87	4.75	4.70	4.70	4.68	4.67	4.70	4.75	4.83	4.83	4.79	3.21	8.00
1869.	5.00	5.00	5.00	4.96	4.96	4.96	4.96	4.96	4.96	5.00	5.00	4.96	4.97	2.83	7.80
1870.	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	2.64	7.36
1871.	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	2.73	7.45
1872.	4.70	4.65	4.62	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.73	4.75	4.66	3.06	7.72
1873.	4.75	4.75	4.83	4.93	4.93	4.85	4.85	4.85	4.88	4.88	.....	.....	4.85	3.05	7.90
1874.	4.65	4.65	4.65	4.65	4.65	4.65	4.55	4.55	4.65	4.65	4.65	4.65	4.63	2.28	6.91
1875.	4.65	4.70	4.35	4.40	4.40	4.39	4.39	4.30	4.40	4.40	4.40	4.40	4.42	2.11	6.53

PRICES IN DOLLARS OF ANTHRACITE COAL FOR FIFTY YEARS, FROM 1826 TO 1875.

*Prices of Schuylkill White Ash Lump Coal, by the cargo, at Philadelphia.
 Averaged monthly from mean of weekly quotations. Tons of 2,240 lbs.*

Compiled for The American Iron and Steel Association.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average for year.
1826...	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.50	7.80	.....
1827...	.....	.....	.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.50	7.80	.....
1829...	.....	.....	.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.50	7.80	.....
1830...	*7.25	*7.25	*6.00	*5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	.....
1833...	.....	.....	6.00	5.50	5.25	5.25	5.25	5.25	5.17½	4.87½	4.87½	4.87½	.....
1834...	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.84
1835...	4.56	4.56	4.56	4.56	4.60	4.63	4.63	4.68	4.88	4.90	5.03	6.47	4.84
1836...	7.70	7.44	7.31	6.58	5.38	5.50	5.50	6.19	6.41	6.50	7.13	8.05	6.64
1837...	8.25	*8.25	8.04	6.78	6.50	6.38	6.10	6.00	6.00	6.09	6.13	6.13	*6.72
1838...	6.13	5.91	5.28	5.25	5.16	5.13	5.13	5.13	5.10	5.00	5.00	5.00	5.27
1839...	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1840...	5.00	5.00	5.00	5.00	5.00	4.63	4.63	4.63	4.66	4.95	5.06	5.34	4.91
1841...	6.40	7.00	6.44	5.88	5.69	5.17	5.13	5.27	5.56	5.63	5.63	5.63	5.79
1842...	5.63	5.56	5.06	4.38	4.03	3.88	3.83	3.60	3.56	3.51	3.56	3.56	4.18
1843...	*3.50	*3.25	*3.25	3.25	3.25	3.25	3.25	*3.25	3.25	*3.25	3.25	3.25	*3.27
1844...	3.50	3.33	3.10	3.02	3.00	3.03	3.13	3.21	3.26	3.26	3.27	3.26	3.20
1845...	3.26	3.26	3.27	3.31	3.31	3.31	3.44	3.44	3.59	3.74	3.76	3.81	3.46
1846...	3.81	3.75	3.72	3.84	3.87	3.97	4.00	*3.94	3.96	3.88	4.00	*4.00	*3.90
1847...	3.88	3.81	3.81	3.81	3.60	3.63	3.69	3.83	3.95	3.88	3.88	3.88	3.80
1848...	3.90	3.90	3.58	3.44	3.37	3.29	3.33	3.56	3.46	3.41	3.39	3.36	3.50
1849...	3.36	3.36	3.45	3.62	3.62	3.86	3.88	3.81	3.75	3.69	3.57	3.50	3.62
1850...	3.54	3.50	3.40	3.31	3.25	3.25	3.25	3.25	4.25	4.25	4.25	4.25	3.64
1851...	4.28	4.13	3.56	3.31	3.10	3.00	3.00	3.05	3.17	3.20	3.25	3.00	3.34
1852...	3.18	3.47	3.40	3.44	3.44	3.45	3.45	3.50	3.56	3.56	3.56	3.50	3.46
1853...	3.42	3.44	3.45	3.47	3.47	3.47	3.47	3.64	4.03	4.19	4.19	4.10	3.70
1854...	4.50	4.50	4.25	4.39	4.81	5.16	5.55	6.00	6.00	5.81	5.68	5.69	5.19
1855...	5.60	5.28	4.53	4.50	4.50	4.45	4.28	4.19	4.19	4.19	4.15	4.06	4.49
1856...	4.06	4.23	4.25	4.25	4.05	4.00	4.00	4.00	4.12	4.13	4.10	4.08	4.11
1857...	3.92	3.92	3.92	3.89	3.85	3.85	3.88	3.87	3.85	3.82	3.82	3.82	3.87
1858...	3.83	3.83	3.77	3.47	3.22	3.23	3.15	3.25	3.32	3.32	3.32	3.30	3.43
1859...	3.28	3.38	3.34	3.20	3.20	3.20	3.20	3.20	3.19	3.20	3.34	3.29	3.25
1860...	3.28	3.29	3.30	3.30	3.25	3.31	3.36	3.39	3.50	3.53	3.62	3.63	3.40
1861...	3.63	3.63	3.50	3.24	3.25	3.29	3.37	3.40	3.35	3.33	3.33	3.33	3.30
1862...	3.33	3.33	3.11	12.78	*2.78	3.64	4.58	4.85	4.98	5.22	5.50	5.63	4.14
1863...	5.38	5.25	4.63	4.75	5.50	5.80	6.25	6.50	6.75	7.25	7.50	7.13	6.06
1864...	7.10	6.75	6.59	7.20	7.88	8.34	9.78	10.75	10.13	8.90	8.88	8.38	*8.39
1865...	8.38	8.38	8.63	8.10	6.75	6.25	6.03	6.50	8.32	9.93	8.81	8.25	7.86
1866...	7.94	7.75	4.50	5.25	5.13	5.53	5.88	5.68	5.87	5.34	5.25	5.05	5.80
1867...	5.06	5.06	4.47	4.50	4.44	4.38	4.28	4.07	4.09	4.01	4.00	4.00	4.37
1868...	4.00	3.13	3.13	3.22	3.25	3.25	3.25	3.25	4.10	4.50	5.22	6.00	3.86
1869...	5.15	5.01	4.15	3.81	3.90	5.00	6.59	7.17	6.15	6.00	5.87	5.12	5.31
1870...	5.07	4.79	4.79	4.50	4.50	4.41	4.31	4.44	4.33	4.19	3.69	3.55	4.39
1871...	4.05	**	**	**	**	4.52	4.45	4.25	4.35	4.68	4.72	4.63	4.46
1872...	4.63	3.78	3.50	3.50	3.50	3.50	3.50	3.59	3.71	3.90	3.90	3.90	3.74
1873...	3.90	3.90	4.00	4.00	4.10	4.20	4.40	4.40	4.50	4.60	4.60	4.60	4.27
1874...	4.11	4.11	4.05	4.10	4.20	4.30	4.45	4.60	4.75	4.90	5.05	5.05	4.55
1875...	4.11	4.11	4.10	4.10	4.10	4.40	4.50	4.50	4.55	4.55	4.55	4.55	4.39

PRICES OF LEHIGH COAL IN PHILADELPHIA. (From Grotjan's *Public Sale Report*.)
 1822, May to December, \$8.40. 1823, January to August, \$10; September, \$9.50; October to December, \$8.40. 1824, January to April, \$8.40.

* Uncertain.

† Rise due to frost.

‡ Lowest average for month, \$2.75=April and May, 1902.

§ Highest average for month, \$10.15=August, 1904.

|| Lowest average for year, \$5.25=1864.

¶ Highest average for year, \$9.30=1864.

** Owing to the long strike, there was no coal in first hands for sale during these months.

†† No sales made in Philadelphia.

‡‡ Minor strike; no sales.

THE ANTHRACITE COAL TRADE OF PENNSYLVANIA FROM ITS
COMMENCEMENT (SHIPMENTS ONLY).—Tons of 2,240 lbs.

The Total Production in each year has been very slightly in excess of the quantity shipped.

By P. W. Sheaffer, Engineer and Geologist, Pottsville, Pa.

Year.	Lehigh. Tons.	Schuylkill. Tons.	Wyoming. Tons.	Total Tons.	THE CUMBERLAND COAL TRADE, From its commencement. (Shipments only.) — Tons of 2,240 pounds. — Compiled from official sources.
1820.....	365	.....	.....	365	
1821.....	1,073	.....	.....	1,073	
1822.....	2,240	1,480	.....	3 720	
1823.....	5,823	1,128	.....	6,951	
1824.....	9,541	1,567	.....	11,108	
1825.....	28,393	6,500	.....	34,893	
1826.....	31,280	16,767	.....	48,047	
1827.....	32,974	31,360	.....	63,434	
1828.....	39,232	47,284	.....	77,516	
1829.....	25,110	79,973	7,000	112,083	
1830.....	41,750	89,984	45,000	174,734	
1831.....	40,966	81,854	54,000	176,820	
1832.....	70,000	209,271	84,000	363,271	
1833.....	123,001	252,971	111,777	487,749	
1834.....	106,244	226,692	43,700	376,636	
1835.....	131,250	339,508	90,000	560,758	
1836.....	148,211	432,045	103,861	684,117	
1837.....	223,902	530,152	115,387	869,441	
1838.....	213,615	446,875	78,207	738,697	
1839.....	221,025	475,077	122,300	818,402	
1840.....	225,313	490,596	148,470	864,379	
1841.....	143,037	624,466	192,270	959,773	
1842.....	272,540	583,273	252,399	1,108,412	
1843.....	267,793	710,200	285,605	1,263,598	
1844.....	377,002	887,937	365,911	1,630,850	
1845.....	429,453	1,131,724	451,836	2,013,013	
1846.....	517,116	1,308,500	518,389	2,344,005	
1847.....	633,507	1,665,735	583,067	2,882,309	
1848.....	670,321	1,733,721	685,196	3,089,238	
1849.....	781,656	1,728,500	732,910	3,243,066	
1850.....	690,456	1,840,620	827,823	3,358,899	
1851.....	964,224	2,328,525	1,156,167	4,448,916	
1852.....	1,072,136	2,636,835	1,284,500	4,993,471	
1853.....	1,054,309	2,665,110	1,475,732	5,195,151	
1854.....	1,207,186	3,191,670	1,603,478	6,002,334	
1855.....	1,284,113	3,552,943	1,771,511	6,608,567	
1856.....	1,351,970	3,602,999	1,972,381	6,927,550	
1857.....	1,318,541	3,373,797	1,952,603	6,644,941	
1858.....	1,380,030	3,273,245	2,186,094	6,839,369	
1859.....	1,628,311	3,448,708	2,731,236	7,808,255	
1860.....	1,821,674	3,749,632	2,941,817	8,513,123	
1861.....	1,738,377	3,160,747	3,055,140	7,954,264	
1862.....	1,351,054	3,372,583	3,143,770	7,869,407	
1863.....	1,894,713	3,911,683	3,759,610	9,566,006	
1864.....	2,034,669	4,161,970	3,960,836	10,157,475	
1865.....	2,040,913	4,356,959	3,254,519	9,652,391	
1866.....	2,179,364	5,787,902	4,736,616	12,703,882	
1867.....	2,502,054	5,161,671	5,325,000	12,988,725	
1868.....	2,507,582	5,335,731	5,990,813	13,834,126	
1869.....	1,929,523	5,725,138	6,068,369	13,723,030	
1870.....	3,172,916	4,851,895	7,825,128	15,849,899	
1871.....	2,116,683	6,314,422	6,682,302	15,113,407	
1872.....	3,743,278	6,469,942	8,812,905	19,026,125	
1873.....	3,243,168	6,294,769	10,047,241	19,585,178	
1874.....	4,047,656	5,642,160	9,290,910	18,980,726	
1875*.....	2,724,483	6,377,468	10,509,394	19,611,334	
					Total, 28,681,457

* Figures for 1875 were furnished as by R. P. Rothwell, Editor of the *Engineering and Mining Journal*.

THE RAILROADS OF THE WORLD, IN ENGLISH MILES.

Dr. G. Stuermer, of Bromberg, Prussia, has for some years collected statistics of the length of the railroads throughout the world. The editors of the *New York Railroad Gazette* summarize, as follows, his conclusions for the year 1875, in which we have made corrections for the United States and Canada.

EUROPE.			ASIA.		
Country.	Opened in 1875.	Total at close of 1875.	Country.	Opened in 1875.	Total at close of 1875.
Germany.....	1,493	17,372	Russia in Asia.....	304	623
Austria.....	467	10,792	Asia Minor.....	47	249
Great Britain.....	250	16,699	Hindustan.....	216	6,489
France.....	573	13,414	Ceylon.....		82
Belgium.....	62	2,167	Java.....		162
Holland.....		1,011	Japan.....		38
Luxembourg.....		166			
Switzerland.....	283	1,293	Total in Asia.....	567	7,643
Italy.....	196	4,777			
Spain.....	169	3,602			
Portugal.....	69	641			
Denmark.....	130	783			
Sweden.....	406	2,465			
Norway.....		310			
Russia in Europe.....	81	11,525			
Turkey in Europe.....		955			
Roumania.....	168	766			
Greece.....		7			
Total in Europe.....	4,347	88,743	Total in North America	2,071	79,519

Dr. Stuermer notes no additions to the mileage of any country in Central or South America, Australasia, or Africa, in 1875, but there probably were some miles of railroad constructed in South America during that year. The total mileage of each of these countries is given below.

SOUTH AMERICA.		AFRICA.		AUSTRALASIA.	
Country.	Total at close of 1875.	Country.	Total at close of 1875.	Country.	Total at close of 1875.
Venezuela.....	8	Egypt.....	950	Victoria.....	563
British Guiana.....	60	Algiers.....	333	New South Wales.....	405
Brazil.....	831	Tunis.....	37	Queensland.....	263
Argentine Republic.....	987	Cape Colony.....	65	South Australia.....	196
Uruguay.....	190	Mauritius.....	65	West Australia.....	40
Paraguay.....	45			Tasmania.....	45
Chili.....	618	Total in Africa.....	1,451	New Zealand.....	238
Peru.....	962			Tahiti.....	2
Total in S. America.....	3,701			Total.....	1,752

CENTRAL AMERICA AND W. INDIES.		SUMMARY.		
Country.	Total at close of 1875.	Country.	Opened in 1875.	Total at end of 1875.
Honduras.....	56	Europe.....	4,347	88,745
Costa Rica.....	29	Asia.....	567	7,643
Cuba.....	400	Africa.....		1,451
Jamaica.....	27	North America.....	2,071	79,519
Colombia (Panama Railroad).....	47	C. America and W. Indies.....		559
Total in Central America and West Indies.....	559	South America.....		3,701
		Australasia.....		1,752
		Total.....	6,985	183,370

Thus it appears that 46 $\frac{3}{4}$ per cent. of the railroad mileage of the world is in the United States, 43 $\frac{1}{4}$ per cent. in North America, 45 $\frac{1}{4}$ per cent. in all America. Europe has 48 $\frac{1}{4}$ per cent., Asia little more than 4 per cent., Africa about $\frac{3}{4}$ of 1 per cent., Australasia less than 1 per cent. The United States constructed more than any other country in 1875.

IMMIGRATION INTO THE UNITED STATES BY CALENDAR YEARS.

Prepared from statistics furnished by Dr. Edward Young, Chief of the U. S. Bureau of Statistics.

The number of immigrants from the foundation of the government to 1820 is estimated at 250,000. In the decade 1811-20, there were 131,251 immigrants; in 1821-30, there were 599,125; in 1831-40, there were 1,213,231; in 1851-60, there were 2,566,254; in 1861-70, there were 2,491,461; in 1871-80, there were 1,729,300. Grand total, 9,250,960.

NATIONALITY.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.
Great Britain and Ireland.....	43,472	47,990	122,799	116,951	112,237	131,620	125,520	107,583	147,716	151,089	143,907	157,905	159,355	100,422	66,179
Germany.....	31,661	27,629	33,162	57,276	83,424	115,892	133,426	123,070	124,788	91,779	107,201	155,595	133,141	56,927	36,565
Austria-Hungary.....	51	111	85	239	422	91	692	395	2,523	5,284	4,889	6,132	7,835	7,743	6,786
Sweden and Norway.....	616	892	1,627	2,249	6,109	12,631	14,355	20,419	41,835	24,365	22,966	24,963	29,458	10,917	10,496
Denmark.....	234	1,658	1,492	712	1,149	1,862	1,436	2,019	4,282	3,041	2,346	3,758	5,095	3,188	1,951
Netherlands.....	283	432	416	708	779	1,716	2,223	632	1,300	970	1,122	2,006	4,640	1,533	1,073
Belgium.....	153	169	201	389	741	1,254	789	1,578	1,903	1,039	1,68	964	1,306	705	623
Switzerland.....	1,007	643	690	1,396	2,889	3,823	4,168	3,261	3,488	2,474	2,824	4,031	3,223	2,436	1,641
France.....	2,326	3,142	1,838	3,128	3,583	6,855	5,527	3,936	4,118	3,586	5,780	13,782	10,813	8,741	8,607
Spain.....	448	348	500	917	692	718	904	816	1,112	511	618	558	486	571	533
Portugal.....	47	72	86	240	365	344	126	245	263	291	59	370	34	52	121
Italy, Sicily, Sardinia, and Malta.....	814	566	547	600	926	1,385	1,624	1,408	2,182	2,948	2,948	7,322	7,511	5,878	3,550
Russia, Poland, and Finland.....	82	142	171	421	711	680	515	432	667	1,910	1,861	3,988	6,466	8,900	5,100
Europe, not specified.....	6	16	20	16	21	28	36	21	27	33	37	56	124	46	63
West India Islands.....	358	585	492	719	851	885	817	858	3,016	1,109	1,228	1,303	1,974	1,750	1,520
British North America.....	2,669	3,273	3,464	3,636	21,586	32,150	6,014	10,804	39,210	53,540	39,929	40,288	29,508	30,596	23,420
Mexico.....	218	142	96	90	193	230	292	275	371	461	463	604	473	442	682
Central America.....	21	27	9	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South America.....	97	146	94	132	148	294	224	145	59	84	110	123	158	129	139
China.....	7,518	3,633	7,211	2,975	2,942	2,385	3,583	10,611	14,902	11,943	6,009	10,642	18,154	16,651	19,033
Asia, not specified.....	10	7	2	7	6	30	98	17	38	115	40	39	63	82	82
Africa.....	47	12	5	37	49	53	25	65	31	24	25	13	13	22	31
Atlantic, Pacific, and East India Islands.....	309	196	257	472	629	377	392	311	495	599	2,209	3,088	2,531	3,062	2,116
Born at sea.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Countries not stated.....	73	254	924	84	8,610	3,165	2,877	8,107	10,636	22,494	20,882	11,752	14,459	16,779	35
Aggregate total aliens.....	91,920	91,987	176,282	193,416	249,061	318,494	298,358	297,215	395,922	378,796	367,789	449,483	437,004	277,593	.....
Less aliens not intending to remain in the United States.....	2,403	2,820	1,692	221	658	3,651	4,757	8,070	10,636	22,493	20,881	11,735	14,459	16,779	.....
Died on the voyage.....	97	162	67	4	9	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aggregate net immigration.....	89,720	89,005	174,523	193,191	248,394	314,840	293,601	289,145	385,287	356,303	346,908	437,750	422,545	260,814	191,231

Note.—The numbers of aliens not intending to remain in the United States during the years 1861 to 1866, inclusive, are not so ascertained by countries.

WHOLESALE PRICES AT NEW YORK, IN 1860 AND 1876, OF STAPLE ARTICLES OF HARDWARE.

Reported for The American Iron and Steel Association by David Williams, Publisher of The Iron Age.

ARTICLES.	Quantity.	Description.	Gold. 1860.	Currency. 1876.
Axes.....	Per dozen.		\$9 00@10 00	\$9 00@10 00
Augers, cast steel.....	"	1 and 2 inch.	2 88@ 5 76	4 00@ 8 00
Auger-bits.....	"	1/2-inch.	1 44	1 54
Chisels, socket framing.....	"	1 and 2 inch.	4 80@ 6 00	4 80@ 7 20
Chisels, socket firmer.....	"	Per set.	2 50	3 00
Hammers, best cast steel adze-eye.....	"	Nos. 1, 1 1/2, and 2 1/2	50, 8 50, 7 50	85, 8 80, 7 43
Hatchets, best shingling.....	"	Nos. 1, 2, 3.	6 00@ 7 50	5 70@ 7 00
Hatchets, common.....	"	Nos. 1, 2, 3.	3 37@ 4 28	3 57@ 4 29
Pick-axes, best.....	"	Assorted.	8 00@ 9 00	7 50@ 9 00
Wrenches, screw, Coe's genuine.....	"	12-inch.	9 10	7 76
Wrenches, screw, Taft's.....	"	12-inch.	5 60	3 78
Saws, hand, 26-in.....	"	Common.	6 85	6 00
Saws, hand, 26-in.....	"	Good.	10 85@19 88	11 90@19 12
Saws, cross-cut.....	Per foot.		37c.@48c.	36c.@48c.
Saws, back.....	Per dozen {	12-in. com. and best.	10 88@13 80	10 20@15 30
Planes, double iron jack.....	Each.		52c.	54c.
Brass Rocking Cocks.....	Per dozen.	1/2-inch.	5 95	4 05
Brass Bibbs, plain.....	"	3/4-inch.	17 00	12 00
Molasses Gates, Stebbins's.....	"	No. 2.	4 00	2 70
Brass Butts, middle (pairs).....	"	2-inch.	77c.	1 00
Cast Butts, loose joint (pairs).....	"	3 X 3 inch.	89c.	80c.
Wrought Butts, fast joint (pairs).....	"	3-inch.	52c.	54c.
Strap Hinges, light (pairs).....	"	6-inch.	66c.	54c.
T Hinges, light (pairs).....	"	6-inch.	54c.	48c.
Plate Hinges.....	Per pound.		5c.@6c.	5c.@6c.
Wrought-iron Hasps and Staples.....	Per dozen.	8-inch.	42c.	32c.
Wrought-iron Hooks and Staples.....	Per gross.	4-inch.	2 09	2 12
Carriage Bolts, best.....	Per hundred.	3/4 X 3.	1 48	1 40
Carriage Bolts.....	"	5/8 X 2 1/2.	1 04	94c.
Curry Combs, 6 bars open.....	Per dozen.	No. 1.	75c.	72c.
Measuring Tapes, 50 ft., asses' skin.....	"		5 63	5 00
Brick Trowels.....	"	10 1/2-inch.	6 17	7 11
Anvils, steel face, Eagle P. H.....	Per pound.		6 1/2c.	8c.
Bench Vises, Wilson's.....	Each.	No. 2.	3 08	2 93
Nails.....	Per keg.	10d.	2 78@ 3 25	2 75
Rules.....	Per dozen.	No. 0.	1 50	1 44
Levels.....	"	No. 0.	6 00	6 48
Try Squares.....	"	7 1/2-inch.	3 45	2 88
Squares, iron.....	"	No. 2.	3 75	4 50
Fry Pans, iron.....	"	No. 3.	2 62	2 38
Coffee Mills, box.....	"		3 00@12 00	2 82@10 00
Enameled Kettles (4 quart).....	Each.	42l.	45c.	40c.
Cast-Steel Shears, trimming, com.....	Per dozen.	8-inch.	5 60	3 55
Cast-Steel Shears, best.....	"	8-inch.	6 00	4 90
Cut Tacks, full 1/2 wt.....	Per paper.	8-ounce.	1 25@1c.	3 15@1c.
Iron Shoe Nails.....	Per pound.		6 1/2c.	8c.
Shovels.....	Per dozen.	No. 2.	6 50@10 00	6 30@10 00
Cast-Steel Dividers, Binn's.....	"	7-inch.	4 98	5 27
Cast-Steel Dividers, others.....	"	7-inch.	3 90	3 90
Casters, table, iron wheel.....	Per set.	Nos. 1@6.	6c.@13c.	5 1/2c.@11c.
Casters, table, brass.....	"	Nos. 1@6.	10 1/2c.@36c.	11c.@30c.
Meat Cutters, Hale's.....	Per dozen.	No. 12.	21 00	20 73
Counter Scales, Hatch's.....	"		21 60	25 20
Tea Scales, Hatch's.....	"		10 00	10 00
Door Knobs, mineral.....	"	No. 400.	1 25	1 12@ 1 29
Door Knobs, porcelain.....	"	No. 300.	1 25	1 50@ 1 69
Screws, iron, for wood (same proportion for other sizes).....	Per gross.	1-inch, No. 9.	24 1/2c.	15 1/2c.

THE ton used in the returns and calculations of the United States census is invariably the net ton of 2,000 pounds, and the ton used by the U. S. Treasury Department in its statements of imports and exports is invariably the gross ton of 2,240 pounds. The values of foreign imports are given in gold, and of domestic exports in currency, except when otherwise stated.

IMPORT DUTIES PER GROSS TON LEVIED BY VARIOUS EUROPEAN COUNTRIES IN 1875 ON IRON AND STEEL
AND MANUFACTURES THEREOF.

From the *London Colliery Guardian of October 8, 1875.*

CLASS OF IRON.		Germany.	France.	Austria.	Russia.	Belgium.	Holland.	Denmark.	Switzerland.	Italy.
		£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	Per cent.	£. s. d.	£. s. d.	£. s. d.
Pig iron.....		47 6	15 10	10 0	10 0	3 9	...	10 11 8	4 7	36 8
Bars.....		47 6	60 0	50 0	68 4	98 4	7 6	11 8	15 10	36 8
T and angle.....		47 6	70 0	68 4	206 8	7 6	5	47 6	15 10	36 8
Common castings.....		47 6	30 0	23 9	98 4	101 8	5	144 2	23 4	91 8
Screws, bolts, etc.....		47 6	63 9	80 0	691 8	188 0	1	47 6	55 10	65 0
Iron anchors and cables.....		47 6	63 9	70 0	196 8	200 10	5	47 6	15 10	65 0
a. Iron wire.....		47 6	80 0	80 0	283 0	7 6	5	47 6	23 4	185 0
b. Steel wire.....		50 0	120 6	80 0	283 0	7 6	5	47 6	23 4	185 0
Rails.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
a. Iron.....		72 1	50 0	87 11	253 4	7 6	...	11 8	15 10	36 8
b. Steel.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Fish and bed plates.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
a. Iron.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
b. Steel.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Tires.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
a. Iron.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
b. Steel.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Locomotive and wagon axles.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
a. Iron.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
b. Steel.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Axles with tires fitted on.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
a. Iron.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
b. Steel.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Bearing and spiral springs.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Steel.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Wrought goods, shafts, winches, etc.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
a. Iron.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
b. Steel.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Locomotives.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
a. Without tender.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
b. With tender.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Steam-engines.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Machine tools.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8
Agricultural machines and implements.....		47 6	47 6	50 0	40 0	7 6	...	11 8	15 10	36 8

£56 7s. 4d. each.
£16 17s. 2d. per tender.

\$155

\$150

\$145

\$140

\$135

\$130

\$125

\$120

\$115

\$110

\$105

\$100

\$95

\$90

\$85

\$80

\$75

\$70

\$65

\$60

\$55

\$50

\$45

\$40

\$35

\$30

\$25

\$20

\$15

**PRICES
OF
AMERICAN
No. 1 ANTHRACITE PIG IRON
AND
IRON RAILS.**

From the date of first quotation in
prices current.

**AND
BESSEMER STEEL RAILS.**

From the date of their first manufacture
on orders in the United States.

PUBLISHED BY

The American Iron and Steel Association,
1876.

IRON RAILS
IN PHILADELPHIA

PIG IRON IN PHILADELPHIA

1842

1843

1844

1845

1846

1847

1848

1849

1850

1851

1852

1853

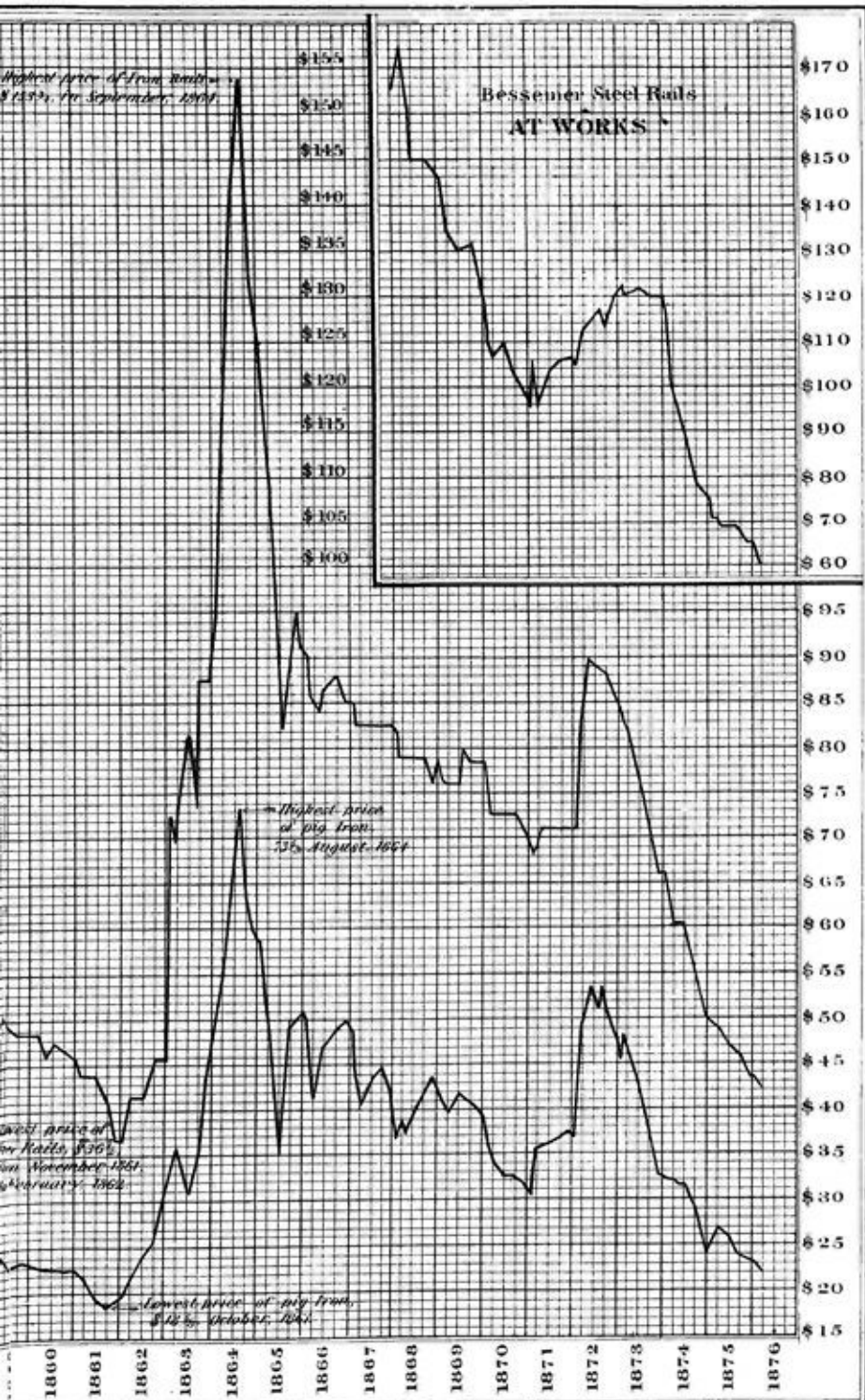
1854

1855

1856

1857

1858



CARNEGIE LIBRARY OF PITTSBURGH



3 1812 03268 6421