

Railroads in the United States.—In no other particular can the prosperity of a country be more strikingly manifested than by the perfection of its roads and other means of internal communication. The system of railroads, canals, turnpikes, post routes, river navigation, and telegraphs, possessed by the United States, presents an indication of its advancement in power and civilization more wonderful than any other feature of its progress. In truth, our country in this respect occupies the first place among the nations of the world.

From returns received at this office, in reply to special circulars, and other sources of information, it is ascertained that there were, at the commencement of the year 1852, 10,814 miles of railroads completed and in use; and that 10,898 miles were then in course of construction, with a prospect of being speedily brought into use. While the whole of these 10,898 miles will, beyond reasonable doubt, have been finished within five years, such is the activity with which projects for works of this character are brought forward and carried into effect, that it is not extravagant to assume that there will be completed within the limits of the United States before the year 1860 at least 35,000 miles of railroads.

The Quincy railroad, for the transportation of granite from the quarries at Quincy to Neponset river, and the Mauch Chunk railroad, from the coal mines to the Lehigh river, in Pennsylvania, were the first attempts to introduce that mode of transportation in this country; and their construction and opening, in the years 1826 and 1827, are properly considered the commencement of the American railroad system. From this period until about the year 1848, the progress of the improvements thus begun was interrupted only by the financial revulsion which followed the events of 1836 and 1837. Up to 1848, it is stated that about 6,000 miles had been finished. Since that date an addition of 5,000 miles has been made to the completed roads, and, including the present year, new lines, comprising about 14,000 miles, have been undertaken, surveyed, and mostly placed under contract.

The usefulness and comparative economy of railroads as channels of commerce and travel have become so evident, that they have in some measure superseded canals, and are likely to detract seriously from the importance of navigable rivers for like purposes. In a new country like ours, many items of expense, which go to swell the cost of railroads in England and on the Continent, are avoided. Material is cheap; the right of way usually freely granted; and heavy land damages seldom interpose to retard the progress of an important work. It is difficult to arrive at a clear approximation to the average cost of railroad construction in the United States. Probably the first important work of this class undertaken and carried through in the Union was the cheapest, as it has proved one of the most profitable, ever built. This was the road from Charleston, in South Carolina, to Augusta, on the Savannah river. It was finished and opened for traffic in 1833. The entire expense of building the road and equipping it with engines and cars for passengers and freight was, at the date of its completion, only \$6,700 per mile; and all expenditures for repairs and improvements, during the eighteen years that the road has been in operation, have raised the aggregate cost of the whole work to only \$1,336,615, or less than \$10,000 per mile.

It is estimated that the 2,870 miles of railroads finished in New England have cost \$132,000,000, which gives an average of nearly \$46,000 per mile. In the middle States, where the natural obstacles are somewhat less, the average expense per mile of the railroads already built is not far from \$40,000. Those now in course of completion—as the Baltimore and Ohio railroad, Pennsylvania Central and other lines, the routes of which cross the Alleghany range of mountains—will probably require a larger proportionate outlay, owing to the heavy expense of grading, bridging, and tunnelling. In those States where land has become exceedingly valuable, the cost of extinguishing private titles to the real estate requires, and the damages to property along the routes, form a heavy item in the account of general expenses of building railroads. In the South and West the case is reversed; there the proprietors along the proposed line of a road are often willing and anxious to give as much land as may be needed for its purposes, and accord many other advantages in order to secure its location through or in the vicinity of their possessions. In the States lying in the valleys of the Ohio and Mississippi the cost of grading, also, is much less than at the eastward. Where the country is wooded, the timber can be obtained at the mere cost of removing it from the track; and through prairie districts, Nature seems to have prepared the way for these structures by removing every obstacle from the surface, while fine quarries of stone are to be found in almost every region. These favorable circumstances render the estimate of \$20,000 per mile in all the new States safe and reliable.

The primary design of nearly all the great lines of railway in the United States has been to connect the seacoast with the distant interior; to effect which object it was necessary to cross the Alleghanies, which intersect every line of travel diverging to the West from the great commercial cities of the sea board.

The following are some of the vast enterprises which have been undertaken to accomplish this great purpose, which have either been finished or are in such a state of progress as leaves no doubt of their being brought to a successful issue within a few years:

First. The railroads connecting Portland, the commercial capital of Maine, with the British provinces, and through their public works, the St. Lawrence river and the lakes, with the western States of the Union.

Second. The railroads from Boston westward, connecting at Albany with the roads of central New York, and, by the more northern route, traversing New Hampshire and Vermont, continuing towards the West by the Ogdensburg railroad, and bringing Montreal, the chief commercial city of Upper Canada, into communication with the capital of New England.

Third. The New York and Erie railroad, extending from New York city to Lake Erie, and intended to form a part of a continuous line from the Hudson to the Mississippi—a project likely to be effected within the ensuing ten years.

Fourth. The Pennsylvania Central railroad, from Philadelphia to Pittsburg, with numerous diverging branches, to points north and south of the general direction. This great route will reach St. Louis

by a nearly due west course through Ohio, Indiana, and Illinois. The Pennsylvania section will be completed about the end of 1852.

Fifth. The Baltimore and Ohio railroad, one of the most magnificent works of the day, will pass from Baltimore through Maryland and Virginia to Wheeling, on the Ohio. At the latter point, it will form a connexion with the system of roads traversing the West and Northwest. It crosses the Alleghanies by the most favorable passes, and, to avoid a very high grade, a tunnel has been cut, perhaps the longest and most expensive in the world.

Sixth. The roads proposed to be constructed under authority of Virginia, and already commenced, intended to establish communication between tide-water and the interior, and southwestern parts of that State, and to continue the same through Tennessee to the Mississippi. These routes pass through the mountains at the southeast corner of Virginia, and the works are in a state of less forwardness than those upon any other of the great lines referred to in this connexion.

Seventh. The several lines of railroad from Charleston and Savannah, penetrating South Carolina and Georgia, concentrating in northeastern Alabama, and reaching the level region of the Mississippi by the valley of the Tennessee river. These roads, by their western continuation, will intersect lines running to every important point between the mountains and the Mississippi.

Eighth. The Mobile and Ohio railroad, from the Mexican gulf to Cairo, on the Ohio river, and thence by the Illinois Central railroad to the lakes, a distance in a straight line of about eleven hundred miles.

It will be seen at a glance that the leading idea in all these vast enterprises was to overcome the barrier presented by this chain of mountains, to a direct and unrestricted intercourse between the sea board and the West, and to supply the want of those natural channels of commerce, navigable rivers, extending into the section we desire to reach. The enormous aggregate of expense of the numerous works specified above, undertaken with this one object, and their importance as public improvements, may be estimated from the following brief notice of the New York and Erie railroad, which occupies the third place in our preceding enumeration: The longest continuous line of railroad in the world, and that in the construction of which the greatest natural obstacles have been overcome, is that which extends from the Hudson river, through the southern counties of New York, to Lake Erie. Its length is four hundred and sixty-nine miles, and it has branches of an additional length of sixty-eight miles. Nearly its whole course is through a region of mountains. The bridges by which it is carried over the Delaware and Susquehannah rivers, and other streams, and the viaducts upon which it crosses the valleys that intercept its route, are among the noblest monuments of power and skill to be found in our country. The most of these works are of heavy masonry; but one of them is a wooden bridge, one hundred and eighty-seven feet in height, with one arch, the span of which is two hundred and seventy-five feet. One of the viaducts is twelve hundred feet long, and one hundred and ten feet high.

The aggregate cost of this important work was \$23,580,000, and the expense of construction was \$42,333 per mile. The road was originally suggested in 1829; a company was organized in 1833; it was finished in May, 1851, and opened with great ceremony for travel

and transportation in that month. The State advanced three millions of dollars towards the work, and afterwards released the company from the obligation to pay the loan. It will be seen that the execution of this great work was pursued through nineteen years, and was not accomplished without calling into requisition both the resources of the State and the means of her citizens.

The following table presents, in a convenient form, some of the principal facts connected with railroads in the United States on the first January, 1852:

States with railroads in operation, or in process of construction.	Miles of railroad com- pleted and in ope- ration.	Miles of railroad in course of construc- tion.	Area of the States in square miles.	Population in 1850.	Number of inhabitants to the square mile.
Maine	315	127	30,000	583,188	19.44
New Hampshire	489	47	9,290	317,964	34.26
Vermont	330	59	9,056	314,120	34.63
Massachusetts	1,089	67	7,800	994,499	127.49
Rhode Island	50	32	1,306	147,544	112.97
Connecticut	547	261	4,674	370,791	79.33
New York	1,826	745	46,000	3,097,394	67.33
New Jersey	226	111	8,320	489,555	58.84
Pennsylvania	1,146	774	46,000	2,311,786	50.25
Delaware	45	11	2,120	91,535	43.17
Maryland	376	125	9,356	583,035	62.31
Virginia	478	818	61,352	1,421,661	23.17
North Carolina	249	385	45,000	868,903	19.30
South Carolina	340	298	24,500	668,507	27.23
Georgia	764	229	58,000	905,999	15.62
Alabama	121	190	50,722	771,671	15.21
Mississippi	93	273	47,156	606,555	12.86
Louisiana	63	—	46,431	517,739	11.15
Texas	—	32	237,321	212,592	0.89
Tennessee	112	748	45,600	1,002,625	21.98
Kentucky	93	414	37,680	982,405	26.07
Ohio	828	1,592	39,964	1,980,408	49.55
Michigan	427	—	56,243	397,654	7.07
Indiana	600	915	33,809	988,416	29.23
Illinois	176	1,409	55,405	851,470	15.36
Missouri	—	515	67,380	682,043	10.12
Wisconsin	20	421	53,924	305,191	5.65
	10,843	10,898			

Since the first edition of this report was put to press, information has been received, tending to prove that 2,500 miles of railroad, in progress at the beginning of 1852, had been completed during the year, and that 3,652 miles of new road had been placed under contract, making the aggregates of 13,266 miles of railroad in operation, and 12,681 miles in progress, on the 1st of January, 1853. These facts display a rate of increase in the extension of the railroad system greater than the experience of former years had authorized us to anticipate. New York has 3,047 miles of railroad. This is the greatest absolute amount pos-

sessed by any State; but Connecticut, Massachusetts, and Ohio exceed it in proportion to their area and population. Several other States—as Illinois, Indiana, Georgia, South Carolina, and Wisconsin—have a greater extent of railway accommodation, according to population, than New York. Of the southern States, Georgia, Alabama, and Mississippi are proceeding most rapidly in the construction of these improvements. In the North, Illinois and Ohio take the lead of all other States. But it will be more satisfactory to copy in this place a table, exhibiting the progress which each State is making, and has made, in such enterprises. It is extracted from the American Railroad Journal, and has been scrutinized with great care, and is believed to be a statement as nearly the exact as any that can be made.

Table showing the number of miles of railroad in operation, and in course of construction, in each State of the Union, on the first of January, 1853.

States.	No. of miles in operation.	No. of miles in progress.	Total.
Maine	394	111	505
New Hampshire	500	42	542
Vermont	427		427
Massachusetts	1,140	66	1,206
Rhode Island	50	32	82
Connecticut	627	198	825
New York	2,123	924	3,047
New Jersey	254	85	339
Pennsylvania	1,244	903	2,147
Delaware	16	11	27
Maryland	521		521
Virginia	624	610	1,234
North Carolina	249	248	497
South Carolina	599	296	895
Georgia	857	691	1,548
Florida	23		23
Alabama	236	728	964
Mississippi	95	875	970
Louisiana	63	200	263
Texas	32		32
Tennessee	185	509	694
Kentucky	94	661	755
Ohio	1,385	1,755	3,140
Indiana	755	979	1,734
Michigan	427		427
Illinois	296	1,772	2,068
Missouri		515	515
Wisconsin	50	470	520
Total	13,266	12,681	25,947

Measures are in progress for establishing railroads in California, with the object of connecting San Francisco with some of the principal towns of the State; and no doubt, ere the lapse of many years, that important division of the Union will be in possession of as large a proportion of these facilities for travel and business as her population and resources require.

From the brief sketch of American railroads should not be excluded some mention of several projects which are not only closely connected with the interests of the United States, but possess something of national importance. The first of these, in point of vastness of design, is the enterprise of building a railroad from the Mississippi river to the Pacific ocean. The routes proposed in this great work are almost as numerous as the persons who claim the merit of having first suggested and brought forward the scheme of thus completing the chain of railroad connexion between the Atlantic and Pacific coasts of the Union. Although the importance of such a work to the prosperity of the nation cannot be doubted, there is reason to suppose that many years will elapse before the resources of the country will be found sufficient for its accomplishment. No scientific survey of any route west of the frontier of Missouri has been made, but it is not probable that any could be found that would bring the line of travel between the Mississippi and the ocean within the limit of 1,600 miles.

The natural obstacles to be overcome are the Rocky mountains and the Sierra Nevada, the deserts between the Missouri and the former chain, and those of the great basin, the flying sands, and the want of timber. Further explorations may lead to the discovery of means to overcome these difficulties. Should the cost not exceed the average of western roads, it would form no objection to the enterprise, since it would be only about \$32,000,000, or only twenty-five per cent. more than has been expended upon the Erie railroad—less than fifty per cent. greater than the aggregate expenditure upon the Baltimore and Ohio railroad, and not two-thirds of that incurred by the State of Massachusetts on her railroads. And even though the average cost should be as heavy as that of the most expensive roads in the country—those of New England, for example—the aggregate expenditure required for the completion of this great national enterprise would not exceed \$72,000,000, which is not a larger sum than has been invested in such improvements in England in a single year. The only question, then, affecting the probability of the construction of the Pacific railroad is that of practicability.

This can only be determined by thorough surveys of some or all of the routes proposed, from the valley of the Rio Grande, the Arkansas, the Missouri, and the upper Mississippi. If this road were completed, and the route continued westward by steamship to Calcutta, it would reduce the time required for the circuit of the globe, by the American overland route, to ninety-three days, as follows:

From New York to San Francisco	4 days.
San Francisco to Hong-Kong	25 "
Hong-Kong to Calcutta	6 "
Calcutta to Bombay	13 "
Bombay to England	35 "
London to New York	10 "

—
93 days.

Another project for connecting, by the means of cheap and rapid conveyance, the two coasts of our confederacy, which deserves, as it has received, very great attention, is the proposition to build a railroad across the isthmus of Tehuantepec, in Mexico. The difficulties which surround this undertaking are chiefly of a diplomatic character, upon the ultimate decision of which the success of the enterprise depends. An American company has taken the work in hand, and caused a preliminary survey to be made, which establishes its feasibility. The length of the road, according to the report of the surveyors, will be 166 miles from sea to sea; but only about 80 miles from the head of navigable water on either side.

The cost of the road, with all the necessary equipments, station-houses, &c., is estimated at \$7,848,000. The time expected to be required for its construction is three years. With this connecting link of communication completed, the voyage from New Orleans to San Francisco will be performed in eight or nine days.

The subjoined table, prepared for the most part from actual returns, exhibits the amount expended upon roads in operation on the 31st December, 1851:

New England States	\$131,940,000
New York	76,000,000
New Jersey	9,040,000
Pennsylvania, Delaware, Maryland, and Virginia	81,600,000
North Carolina	3,800,000
South Carolina	9,860,000
Georgia	13,000,000
Mississippi	1,400,000
Alabama	2,000,000
Louisiana	1,000,000
Tennessee	2,000,000
Kentucky	1,670,000
Ohio	17,560,000
Indiana	9,000,000
Illinois	2,600,000
Michigan	10,000,000
Wisconsin	300,000
Cost of completed railroads in the United States	372,770,000
Probable cost of those in progress	220,000,000
Total amount of capital invested in railroads, December 31, 1851	<u>592,770,000</u>

For the purpose of comparison with the foregoing, the subjoined statement has been prepared, showing the number of miles of railroads, with their costs, according to the most generally received authorities in all the countries of Europe in which those improvements have been to any considerable extent introduced:

	Miles.	Aggregate.	Cost per mile.
Great Britain and Ireland. . . .	6,890	\$1,218,000,000	\$177,000
German States, including Prussia and Austria.	5,332	325,875,000	61,000
France.	1,018	238,905,000	254,000
Belgium.	532	46,288,000	49,000
Russia.	200	15,000,000	75,000
Italy.	170	15,000,000	88,000
	14,142	1,859,068,000	

The preceding table was made before the opening of the railway from St. Petersburg to Moscow, which, being nearly 400 miles in length, would add largely to these statistics, so far as refers to Russia. In France, also, during the past season, 1,500 miles of railway, in addition to that stated in the table, were opened, making the whole extent of railway in that country, in July last, about 2,500 miles; and it is expected that, during the course of the ensuing year, 1,800 miles additional will be completed.

By these statistics it is made to appear that the average cost of European railroads was \$130,300 per mile. The average cost of American railroads completed previous to the commencement of the present year was \$34,307 per mile. The excess of expenditure, therefore, in the construction of European roads over those in the United States, is \$95,993 per mile, or about 280 per cent.; but it may be remarked that the estimated average cost of construction in the United States of all the roads completed and in progress does not exceed \$27,300 per mile; so that the actual excess is \$103,000 per mile.

The foregoing statements develop the striking fact that the United States possess an extent of railroad nearly equal to that of the rest of the world combined; and, at our present rate of progression, we are likely, in a few years, far to exceed it.

In the infancy of the American railroad system, a favorite means of providing funds for their construction was the advance of loans from the treasuries of the respective States in which they were situated; but this plan has been superseded by the use of private capital, and, within the last ten years, frequent recourse has been had to the expedient of loans and subscriptions by counties, cities, and towns through which the roads pass. Loans of this character, however, are in all cases made under the sanction of authority conferred by the State legislatures. The bonds representing these transactions with the stocks of

the companies have been estimated to amount to \$300,000,000. This sum may be assumed as the amount of the capital invested in those roads now in progress, and those which may have been completed since the opening of the year. If, then, we add this sum to the estimated cost of the roads finished in December, 1851, we shall have \$672,770,000 as the total amount of investments in railroads in the United States.

From the best data accessible at this time, we prepare the following table, representing the financial condition of some of the railroads of the States, selected as affording a fair exemplification of the whole system in this country:

	Length of roads.	Aggregate cost.	Net income.	Declared dividends.	Estimated actual profits.
Massachusetts . . .	1,089	\$52,595,288	\$3,260,670	6.2	7.5
New York	1,826	76,000,000	4,023,000	5	9.44
Georgia	754	13,000,000		7.5	10

The figures under the head of "estimated actual profits" present the assumed net income after the addition to the amount of the dividends of the surplus earnings, reserved profits, and all receipts in excess of expenditure not included in the calculation of which the dividend is a result.

The rates of fare on our railroads are lower than on those of any country of which we have returns, affording the means of comparison. In New England, the average rate per mile is slightly over two cents; from New York to Washington, it is three cents and a half per mile. From New York to Cincinnati, the railroad and steamboat fare together is less than two cents per mile. From New York to Albany, the price of passage is a fraction over one cent per mile, and the average rate upon all the New York railroads has been stated at two cents and one-fifth per mile.

Telegraphs.—As telegraphs have formed a subject of inquiry, it is deemed proper to present some account of the information obtained respecting this recent but widely extended and daily enlarging means of communication. At the present time it is a subject engrossing much of the attention of our own citizens, and frequent applications are made to this office, from foreign countries, for information regarding the *minutiae* of the system as conducted in the United States.

Here, the telegraphic system is carried to greater extent than in any other part of the world, and the numerous lines now in full operation form a net-work over the length and breadth of the land. They are not confined to the populous regions of the Atlantic coast, but extend far into the interior, climb the sides of the highest mountains, and cross the almost boundless prairies; and in a few years a continuous communication will be established between the capital of the nation and the

shores of the Pacific, as it now exists between the Atlantic, the great lakes, and the Gulf of Mexico.

It is to American ingenuity that we owe the practical application of the magnetic telegraph for the purpose of communication between distant points, and it has been perfected and improved mainly by American science and skill. While the honor is due to Professor Morse for the practical application and successful prosecution of the telegraph, it is mainly owing to the researches and discoveries of Professor Henry, and other scientific Americans, that he was enabled to perfect so valuable an invention.

The first attempt which was made to render electricity available for the transmission of signals, of which we have any account, was that of Le Sage, a Frenchman, in 1774. From that time to the present, there have been numerous inventions and experiments to effect this object; and from 1820 to 1850, there were no less than sixty-three claimants for different varieties of telegraphs. We will direct attention only to those of Morse, Bain, and House, they being the only kinds used in this country.

During the summer of 1832, Professor S. F. B. Morse, an American, conceived the idea of an electric or electro-magnetic telegraph, and, after numerous experiments, announced his invention to the public in April, 1837.

On the 10th of March, 1837, Hon. Levi Woodbury, then Secretary of the Treasury, issued a circular requesting information in regard to the propriety of establishing a system of telegraphs for the United States, to which Professor Morse replied, giving an account of his invention, its proposed advantages and probable expense. At that time he "presumed five words could be transmitted in a minute." Professor Morse having petitioned Congress for aid to enable him to test the practical operation of his invention, an appropriation of \$30,000 was made for this purpose; and in June, 1844, he erected the first telegraphic line in the United States, between Washington and Baltimore, a length of 40 miles.

This line was extended to Philadelphia and New York, a distance of 250 miles. It reached Boston in 1845, and became the great line of the North, from which branched two others, one from Philadelphia to Pittsburg, Cincinnati, and St. Louis, 1,000 miles; the other from New York to Albany, Buffalo, Cleveland, Chicago, and Milwaukee, 1,300 miles. Another line, 1,395 miles in length, connects Buffalo, Niagara, Toronto, Montreal, Quebec, and Halifax.

Two lines run south to New Orleans—one from New York, Washington, and Charleston, 1,966 miles—the other from Cleveland, Ohio, and Cincinnati, via Nashville, 1,200 miles long.

The only line constructed with government aid was that connecting the cities of Washington and Baltimore. The others have been established by private enterprise. This line is at present, perhaps, the best appointed and most reliable in the world. The following table exhibits the annual receipts of the "Magnetic Telegraph Company," extending

from Washington to New York, which was the first organized in this country:

From January 27, 1846, to July 1, 1846.....	\$4,228	77
“ July 1, 1846, to July 1, 1847.....	32,810	28
“ “ 1847, “ 1848.....	52,252	81
“ “ 1848, “ 1849.....	63,367	62
“ “ 1849, “ 1850.....	61,383	98
“ “ 1850, “ 1851.....	67,737	12
“ “ 1851, “ 1852.....	103,860	84
Total amount received up to July, 1852.....	385,641	42

The number of messages sent over this line in the last six months was 154,514, producing \$68,499 23.

The amount of business which a well-conducted office can perform is immense. Nearly seven hundred messages, exclusive of those for the press, were sent in one day over the Morse Albany line; and a few days after, the Bain line at Boston sent and received five hundred communications. Another office, with two wires—one five hundred, the other two hundred miles in length—after spending three hours in the transmission of public news, telegraphed, in a single day, four hundred and fifty private messages, averaging twenty-five words each, besides the address, sixty of which were sent in succession, without a word of repetition.

The apparatus cannot be worked successfully without skilful operators, good batteries and machines, and thorough insulation of the conductors. The expense of copper wire, which was at first used, has caused it to be superseded by iron, which is found to answer the purpose as well, though it is requisite to give the iron wire six times the weight of a copper one, to gain the same conducting power with equal lengths. About two hundred and fifty pounds of iron wire are required to a mile. Its insulation is effected by winding it around or passing it through caps or knobs of glass, or well-glazed stoneware, or enclosing it with gutta percha. The wires are generally supported on spars or posts, from twenty to thirty feet in height, nine inches in diameter at the base, four and a half at the top, set in the ground five feet deep, and placed from twelve to fifteen rods apart.

Although the wires have been buried in the earth, in some countries, and experiments tried here to effect this object, it would appear, from the latest information received, that this method is unsuccessful, and will be relinquished.

The cost of construction, including wire, posts, labor, &c., is about one hundred and fifty dollars per mile.

The only constant and economical battery used in the United States is Grove's, consisting of cups of zinc, with strips of platinum, in an earthenware or porcelain cup, which cup is filled with nitric acid and is placed inside of the zinc cup, in a tumbler containing diluted sulphuric acid. The main battery on a line, (from four to fifty cups,) requires renewing once in every two weeks, and daily in unfavorable weather and in local batteries of two or three cups.

The earth itself has been made to furnish a supply of electric force; a single pair of zinc and copper plates buried sufficiently deep below the surface to be in the wet sub-soil, will cause a current of low intensity. The earth acts as the return wire to any given number of distinct wires, without in the least affecting the regularity of the action of any of them.

The average performance of the Morse instruments is to transmit from eight thousand to nine thousand letters per hour. The usual charge of transmission is twenty-five cents for ten words, or less, sent one hundred miles.

The following table will show the rates of telegraphic communication between the city of Washington and some of the principal cities of the Union. The distances are given from a table prepared at the Post Office Department.

Telegraphic charges from Washington to the following places for messages containing ten words or less.

Places.	Miles.	Rates.
Albany..... N. Y....	376	\$0 80
Augusta..... Me....	619	1 15
Baltimore..... Md....	40	20
Baton Rouge..... La....	1,539	2 25
Boston..... Mass....	448	75
Buffalo..... N. Y....	703	90
Chicago..... Ill....	1,238	1 25
Cincinnati..... Ohio...	578	70
Cleveland..... do....	439	80
Detroit..... Mich....	970	1 00
Dubuque..... Iowa...	1,449	1 70
Erie..... Pa....	439	1 00
Frankfort..... Ky....	669	2 00
Harrisburg..... Pa....	124	45
Hartford..... Conn....	345	75
Indianapolis..... Ia....	639	1 00
Jackson..... Miss....	1,325	2 00
Louisville..... Ky....	720	95
Madison..... Wis....	1,413	1 55
Memphis..... Tenn....	1,305	1 70
Milwaukie..... Wis....	1,332	1 35
Nashville..... Tenn....	1,142	1 35
Natchez..... Miss....	1,694	2 05
New Albany..... Ia....	723	1 10
Newport..... R. I....	414	75
New Orleans..... La....	1,408	2 20
New York..... N. Y....	232	50
Philadelphia..... Pa....	142	30
Pittsburg..... Pa....	307	45

Telegraphic charges—Continued.

Places.	Miles.	Rates.
Portland Me. . . .	555	\$0 95
Portsmouth N. H. . .	503	1 00
Providence R. I. . .	405	75
St. Louis Mo. . . .	989	1 20
Springfield Ill. . . .	851	1 45
Syracuse N. Y. . .	524	90
Vicksburg Miss. . .	1,371	2 30
Wheeling Va. . . .	331	50
Wilmington Del. . . .	112	25

Messages passing from one very distant point to another have usually to be re-written at intermediate stations; though, by an improved method, the seaboard line has, in good weather, transmitted communications direct between New York and Mobile—a distance of near 1,800 miles—without intermediate re-writing. By the Cincinnati route to New Orleans—a distance of nearly 2,000 miles—the news brought by an Atlantic steamer at 8 o'clock A. M., has been telegraphed from New York to that distant point, and the effects produced in the market there returned to New York by 11 o'clock A. M. The Congressional reports from Washington are usually received simultaneously in Baltimore, Philadelphia, and New York; and all that is necessary at the intermediate stations is for an operator to be present and receive the message as it is developed on paper by the instruments.

The electric telegraph has been applied in this country to a new and highly important purpose—that of the registration of astronomical observations; thus establishing the best possible means for the determination of the difference of longitude. The observatories in different parts of the country are connected by telegraphic wires; and the most delicate experiments, dependent upon the appreciation of minute portions of time, have been successfully performed. This method has been recently used for the determination of the wave time of electrical currents.

The great extent of the telegraphic business, and its importance to the community, is shown by a statement of the amount paid for despatches by the associated press of New York, composed of the seven principal morning papers—the Courier and Enquirer, Tribune, Herald, Journal of Commerce, Sun, Times, and Express. During the year ending November 1, 1852, these papers paid nearly fifty thousand dollars for despatches, and about fourteen thousand dollars for special and exclusive messages not included in the expenses of the association.

The Morse system is used generally throughout the United States. It is used in Prussia, wherever intelligence is transmitted great distances. The great German-Austrian Telegraphic Union, comprising all the States of Germany and Austria, after deliberating in convention at

Vienna, came to the conclusion that none but the American system would fully accomplish their object for international correspondence.

Alexander Bain, a native of Scotland, patented an electro-chemical telegraph on the 12th December, 1846; and another patent was granted to him in connexion with Robert Smith, in October, 1849. The advantages which the inventor attributes to the electro-chemical telegraph are, "1st. More economy and simplicity in the primitive construction. 2d. More rapidity in the transmission of despatches. A single wire, with a good insulator, can transmit 1,200 letters a minute. 3d. An electric current, more feeble than ordinary, suffices to cause the apparatus to work. 4th. More simplicity and economy in the correspondence and superintendence. 5th. Fewer chances of error in the despatches sent." The Bain telegraph used in this country has been materially improved by Henry J. Rogers.

The following is a list of the Bain telegraphic lines in the United States:

New York to Boston, (250 miles each).....	2 wires	500 miles.
Boston to Portland.....	1 "	100 "
Boston to Burlington, Vermont, and thence to Ogdensburg, New York.....	1 "	350 "
Troy to Saratoga.....	1 "	36 "
New York to Buffalo, (513 miles each).....	2 "	1,026 "
	<hr/> 7 "	<hr/> 2,012 "

Five lines, having seven wires and a length of 2,012 miles.

The "House printing telegraph" was invented by Royal E. House, a Pennsylvanian, and patented April 18, 1846.

The first line operating with this instrument was completed in August, 1850, by the Boston and New York Telegraph Company, between those cities. It has been patented in England by Jacob Brett.

The difference between Morse's and House's telegraph is, principally, that the first traces at the distant end what is marked at the other; while House's does not trace at either end, but makes a signal of a letter at the distant end which has been made at the other, and thus, by new machinery, and a new power of air and axial magnetism, is enabled to print the signal letter at the last end, and this at the astonishing rate of sixty or seventy strokes, or breaks, in a second, and at once records the information, by its own machinery, in printed letters. Morse's is less complicated, and more easily understood; while House's is very difficult to be comprehended in its operations in detail, and works with the addition of two more powers—one air, and the other called *axial magnetism*. One is a tracing or writing telegraph; the other, a signal and printing telegraph.

The following are the House lines in operation:

The Boston and New York Telegraph Company; two wires; length, 600 miles.

A line is being constructed to connect with the Boston line, running from Springfield, Massachusetts, to Albany, New York, there to inter-

sect the New York and Buffalo line, using the same instruments, extending from New York to Buffalo, a distance of 570 miles.

One wire is now in operation, connecting with Poughkeepsie, Troy, Albany, Utica, Syracuse, Lyons, Rochester, Albion, Lockport, and Buffalo. The same line to continue to St. Louis, Missouri, connecting with Cleveland, Cincinnati, and Louisville, will soon be completed, forming the longest line in the world under the direction of one company, the whole length being 1,500 miles.

The New Jersey Magnetic Telegraph Company, using House instruments, extends from Philadelphia to New York, two wires, 132 miles each. A line also extends south to Baltimore and Washington. The whole length of House lines in the United States is about 2,400 miles.

List of Telegraphs in the United States.

	Wires.	Miles.	Total miles of wire.
New York and Boston Telegraph Co.....	3	250	750
Merchants' Telegraph Co., N. Y. and Boston.	2	250	500
House's Printing Telegraph.....	1	250	250
Boston and Portland.....	1	100	100
Merchants' Telegraph Co., (Boston and Portland).....	1	100	100
Portland to Calais.....	1	350	350
Boston to Burlington, Vt., and thence to Ogdensburg, N. Y.....	1	350	350
Boston to Newburyport.....	1	34	34
Worcester to New Bedford.....	1	97	97
Worcester to New London.....	1	74	74
New York, Albany, and Buffalo.....	3	513	1,539
N. Y. State Telegraph Co., N. Y. to Buffalo...	2	550	1,100
Syracuse to Ogdensburg.....	1	150	150
Troy to Saratoga.....	1	36	36
Syracuse to Oswego.....	1	40	40
House Telegraph Co., New York to Buffalo..	2	550	1,100
N. Y. and Erie Telegraph, N. Y. to Dunkirk..	1	440	440
N. Y. and Erie Railroad Telegraph, New York and Dunkirk.....	1	460	460
Magnetic Telegraph Co., N. Y. to Washington.	7	260	1,820
House Line, New York to Philadelphia.....	1	100	100
Troy and Canada Junction Telegraph Co., Troy and Montreal.....	1	260	260
Erie and Michigan Telegraph Co., Buffalo to Milwaukee.....	2	800	1,600
Cleveland to Cincinnati.....	2	250	500
Cincinnati to St. Louis, via Indianapolis.....	1	400	400
Cincinnati to St. Louis, via Vincennes.....	1	410	410
Cleveland and Pittsburg.....	2	150	300

List of Telegraphs in the United States—Continued.

	Wires.	Miles.	Total miles of wire.
Cleveland and Zanesville.....	1	150	150
Lake Erie Telegraph Co., Buffalo to Detroit..	1	400	400
Cincinnati and Sandusky city.....	1	218	218
Toledo and Terre Haute.....	1	300	300
Chicago and St. Louis.....	1	400	400
Milwaukie and Green Bay.....	1	200	200
Milwaukie and Galena.....	1	250	250
Chicago to Galena, Whitewater and Dixon...	1	310	310
Chicago and Janesville.....	1	100	100
Buffalo and Canada Junction Telegraph Co..	1	200	200
New York and New Orleans, by Charleston...	1	1,966	1,966
Harper's Ferry to Winchester, Virginia.....	1	32	32
Baltimore to Cumberland.....	1	324	324
Baltimore to Harrisburg.....	1	72	72
York and Lancaster.....	1	22	22
Philadelphia and Lewistown, Delaware.....	1	12	12
Philadelphia and New York.....	6	120	720
Philadelphia and Pittsburg.....	1	309	309
Philadelphia and Pottsville.....	1	98	98
Reading and Harrisburg.....	1	51	51
Troy and Whitehall.....	1	72	72
Auburn and Elmira.....	1	75	75
Pittsburg and Cincinnati.....	2	310	620
Columbus and Portsmouth, Ohio.....	1	90	90
Columbia and New Orleans.....	1	638	638
New Orleans to Balize.....	1	90	90
Cincinnati and Maysville, Kentucky.....	1	60	60
Alton and Galena.....	1	380	380
St. Louis and Independence.....	1	25	25
St. Louis and Chicago.....	1	330	330
Newark and Zanesville.....	1	40	40
Mansfield and Sandusky.....	1	40	40
Columbus and Lancaster, Ohio.....	1	30	30
Lancaster and Logan.....	1	26	26
Cincinnati to Dayton.....	1	100	100
Zanesville and Marietta.....	1	66	66
Dunkirk, New York, and Pittsburg.....	1	200	200
Camden and Cape May, New Jersey.....	1	100	100
Camden and Mount Holly, New Jersey.....	1	25	25
New York and Sandy Hook.....	1	80	80
Cleveland and New Orleans, by Cincinnati...	1	1,200	1,200
	89	16,735	23,281

The telegraphs in England are the next in importance and extent to those in this country. They were first established in 1845, and there are about 4,000 miles of wire now in operation.

The charge for transmission of despatches is much higher than in America, one penny per word being charged for the first fifty miles, and one farthing per mile for any distance beyond one hundred miles. A message of twenty words can be sent a distance of 500 miles in the United States for one dollar, while in England the same would cost seven dollars.

In June, 1852, the submarine telegraph between Dover and Ostend was completed, and on the 1st of November the first electric communication was established direct between Great Britain and the Continent of Europe. By a line of wires between London and Dover, via Doncaster and Canterbury, in connexion with the submarine cable across the Straits of Dover, instantaneous communication is obtained between *London, Paris, Sweden, Trieste, Cracow, Odessa, and Leghorn*. The wires are also being carried onward to St. Petersburg; also to India, and into Africa.

A project has been formed for constructing a submarine telegraph between Great Britain and the United States. It is proposed to "commence at the most northwardly point of Scotland, run thence to the Orkney islands, and thence by short water lines to the Shetland and the Feroe islands. From the latter, a water line of 200 miles conducts the telegraph to Iceland, thence to Greenland, and across Davis's straits to Byron's Bay, on the coast of Labrador. The entire length of the line is estimated at 2,500 miles—the submarine portions of it at 1,500 miles; and the expense of this great international work is estimated at £500,000.

Another enterprise has been actually started, with every prospect of consummation. A portion of the line is being prosecuted with vigor, and the company propose transmitting intelligence between the Old and New Worlds in four or five days. A charter has been granted by the British Colonial government to the "Newfoundland Electric Company," with a capital of £100,000, to construct a line of telegraph from Halifax, N. S., to Cape Race, touching at St. John, crossing the island of Newfoundland to Cape Ray; thence, by a submarine line of 149 miles, to cross the Gulf of St. Lawrence, a landing being made at Cape East, on Prince Edward's island, and, crossing Northumberland straits by another submarine line of ten miles, to land at Cape Torment, in New Brunswick, and so on to the boundary of the United States; whence, by an independent line to New York, the connexion is completed. The total distance traversed by this line will be between 1,400 and 1,500 miles, of which 150 are submarine. It is stated that steamers can make ordinary passages between Cape Race, Newfoundland, and Galway, Ireland, in five days.

The following is a list of lines now in operation or construction in *Canada*:

	Miles
The Montreal Telegraph Company's line extending from Quebec to the suspension bridge at Niagara Falls	155
British North American Electric Telegraph Association, from Quebec to New Brunswick frontier	220
Montreal and Troy Telegraph Company, from Montreal to New York State line	47
Bytown and Montreal Telegraph Company	115
Western Telegraph Company, from Hamilton to Port Sarnia, at the foot of Lake Huron	143
Niagara and Chippewa line	14
Brantford to Simcoe and Dover	33
Kingston to Hamilton	256
Total length in Canada	<u>983</u>

In Prussia the wires are generally buried about two feet below the surface, and carried through rivers in flexible pipes. About 1,700 miles of telegraphic lines are in operation.

In France there are about 750 miles; and in Germany about 3,000 miles have been completed.

In Austria, Saxony, Bavaria, Tuscany, Holland, Italy, Spain, and Russia, great progress has already been made in establishing lines of telegraph, and communication will soon be had between the capitals of all the States in Europe.

In India, a line has been laid between Calcutta and Kedgerree, 71 miles, and an extensive system is projected for that country. The following details respecting the telegraph in India is given for the instruction and encouragement of those interested in the construction of lines through somewhat similar regions in our own country.

From Calcutta to Rajmoole, the conductor is laid under ground, in a cement of melted resin and sand. From that village to Kedgerree, it is carried over ground on bamboo poles, fifteen feet high, coated with coal tar and pitch, and strengthened, at various distances, by posts of willow, teak, and iron wood. The bamboo posts are found to resist storms which have uprooted trees, the growth of centuries. Though the bamboo soon decays, yet its amazing cheapness makes the use of it more economical than that of more durable and costly materials. The branch road from Bishlopore to Moyapore passes through a swamp; the country is little less than a lake for five months. The conductor runs on the foot paths between the island villages, and, for some miles, crosses rice swamps, creeks, and ponds, on which no road or embankment exists. The most difficult and objectionable line was selected to test the practicability of carrying the conductors through swampy ground, and it has been perfectly successful. The Huldee river crosses the Kedgerree line half way, and varies in breadth from 4,200 to 5,800 feet. A gutta percha wire, secured in the angles of a chain cable, is laid across and under this river; and the chain is

found to afford perfect protection from the grapnels of the heavy native boats which are constantly passing up and down.

The over-ground lines differ totally from those in use in England and America, or any other country, in this important respect. No wire is used. Instead of wire, a thick iron rod, from three to five-eighths of an inch in diameter, weighing one ton to a mile, is adopted; the heaviest wire elsewhere used being only 250 pounds to the mile. The advantages of these substantial rods are these: They possess a complete immunity from gusts of wind, or ordinary mechanical violence. If accidentally thrown down, they are not injured, though passengers, bullocks, buffaloes, and elephants may trample on them. Owing to the mass of metal, they give so free a passage to the electric currents, that no insulation is necessary. They are extended from bamboo to bamboo without any protection, and they work without interruption through the hardest rains. The thickness of the wire allows of their being placed on the post without any occasion for the straining and winding apparatus, whereas the tension of wires exposes them to fracture, occasions expense in construction, and much difficulty in repairs. The thick rods also admit of rusting without danger, to an extent which would be destructive to a wire. And, lastly, in considering repairs, the rods are but little more costly than small wire, and the welding occasions no difficulty.

The importance of this discovery of the superiority of *rods* over *wire* will be fully appreciated in a country like India, where the line must often run through a howling wilderness, tenanted by savage beasts, or more savage men. The lines must therefore protect themselves, and this is secured by the use of thick rods.

The expense of this experimental line was about \$200 a mile. The pecuniary returns were originally calculated at about \$90 a month; but they have been more than three times that amount.

CONCLUSION.

The balance of the appropriation of 1850 was drawn from the treasury on the 4th of September last. It is believed that the additional sum of \$25,000 will be required to complete all the purely statistical portions of the work and prepare the same for the press, and to pay the expenses of superintending the printing of the first volume, and preparing the second volume in the manner proposed in my former report, and superintending to its completion the whole work, the further sum of \$25,000 will be required to pay all expenses and complete the work by the close of the next fiscal year.

The more particular the analysis of the returns of the Seventh Census, the more interesting do they appear, and the more confident are we of their general correctness and reliability. There is no question but they present the most ample materials for representing, with almost perfect accuracy, the social, civil, and physical condition of the American people. While, in the minutiae of some small details, ingenuity may discover discrepancies in these returns, as in all others, they present

such an array of facts and body of accurate information relating to our people and country as exists respecting no other nation. While the savans of the old world are digging into the ruins of cities, removing mountains of sand, and excavating subterranean temples, to discover the most feeble rays pointing out the history of nations of antiquity, we possess, respecting our own, archives, of which the like would be sought for in vain in any other country, and which furnish every facility for us to know ourselves, and to transmit our true history to posterity.

The importance of statistical investigations and publications cannot be more strongly illustrated than by the examples of those nations of the Old World where the power existed in the throne to admit of their continuance, or suspend their development, as policy, in view of the existing state of the country, would seem to dictate. Statistical researches instituted by Louis XIV. after the treaty of Ryswick, were annihilated in France when it was necessary to smother the revelations of her decay, as they would be illustrated, during the war of the Spanish Succession, and the disasters of Hochstadt and Ramillies. The same result was exhibited a century after, when the statistical investigations re-established by the First Consul in 1802, after the peace of Amiens, were not allowed to exist, to make manifest the condition of the country after the catastrophe at Leipzig.

With reference to the present progress of statistical science in Europe, a late French writer, Moreau de Jonnes, remarks that, "A profound peace, whose duration is unexampled, has caused an admirable emulation to spring up among all the nations of Europe, which, to repair the misfortunes occasioned by their former numerous wars, and to attain to greater prosperity, have ardently employed themselves in the cultivation of *statistics*, which is the basis of enterprise, and from the registers of which they obtain instruction in those things affecting the welfare of the state and people." One of the best evidences of the truth of his remarks is furnished by the National Statistical Congress proposed to be held at Brussels in September of 1853—a meeting referred to in my last report, to be composed of delegates from all nations, the convening of which in 1852, was postponed on account of the unsettled state of European affairs. These illustrations serve to show the value and moral force of statistical revelations, and the duty of a self-governed people, like ours, to sustain them, and to demand a proper publication of their developments, and that it should form a work easily comprehended in all its parts—one not exclusively for the learned, but adapted to the wants of all who would wish to consult it.

The preparation of such a work is not only within the compass of possibility, but, with the means possessed, can be readily accomplished by industry and a reasonable amount of ability. That the expense necessarily attending the publication has been generally exaggerated, will appear from an examination of the correspondence relating thereto, which has been transmitted to you. Many great men, as Lavoisier, Vauban, Necker, and Young, for want of better means than they possessed, have made use of much more imperfect data than ours to arrive, approximately, at the truth; and the character of their data, imperfect as it was admitted to be, did not intimidate them from

making use of the materials they possessed, nor deter their governments from adopting their deductions. Of these permit me to present but one illustration—that exhibited by Lavoisier, to whom a committee of the National Assembly in France applied, in 1790, for information to enable them to prepare, in accordance with the directions of that body, a rational basis for the establishment of taxes. To meet the wishes of the committee, and to form his calculations respecting the quantity of land cultivated, and the quantities of production and consumption, this learned man used, as a means of arriving at the desired facts, the number of ploughs which was supposed to exist in each commune. The results thus arrived at were adopted, and subsequent revelations, made upon more sufficient data, exhibited in them a close and wonderful approximation to the truth. Our materials present no such hypothetical character, but are deemed generally accurate and reliable, and are of a character to warrant their publication.

Respectfully submitted:

I have the honor to be your obedient servant,

JOS. C. G. KENNEDY.

HON. ALEX. H. H. STUART,
Secretary of the Interior.

EFFECTS OF IMMIGRATION ON THE ADVANCEMENT OF POPULATION IN
THE UNITED STATES.

The effects of immigration upon the progress of population in the United States is a subject on which considerable difference of opinion has heretofore existed, and in the discussion of which many able pens have been from time to time employed. With a view to the attainment of the greatest possible accuracy, the statement published in the report of 1851, presenting in a tabular form the number of immigrants from 1790 to 1850, with their natural increase in periods of ten years, has been revised; and the result of the inquiries instituted has been to confirm the correctness of the results then announced.

The rule adopted in preparing the statement referred to, for determining the actual increase of immigrants, until they became amalgamated with the mass of the population, was to assume the rate of increase of that class to be equal to one-half that of the entire body of white inhabitants, of native and foreign birth. By some this rule has been thought too liberal towards the class of adopted citizens, and by others it has been thought that its effect is to exaggerate the importance of accessions to our population from this source. Upon the side of those who entertain the former opinion it is urged that the proportion of females among immigrants is much less than among native citizens; that they suffer hardships in their passage across the ocean, and upon their arrival before they become settled, which render them peculiarly liable to disease, and diminish the average length of life among them; and, finally, that the state of poverty which is in so many cases the motive for leaving the shores of the Old World, continues with males and females of the marriageable ages for so long a period after reach-

ing the United States, as to disincline large numbers of them to the formation of family ties. These are considerations tending to show that immigrants are subject to laws of mortality less favorable to length of life than natives of the country, and that their natural increase is retarded by circumstances which do not operate upon those among whom they settle. But there are certain facts which counteract the influence of such causes, to which attention is now called. If the proportion of female immigrants to males is less than among natives, the proportion of those within the limits of the child-bearing age is much greater. If immigrants are subjected to special causes of disease and death, the comparative number of children and aged persons among them—that is, of those who most swell the bills of mortality in every country—is remarkably small. If it be true that many more of the industrial classes of Irishmen, Germans, and other foreigners remain unmarried to a late age, or throughout life, than among the same classes of the native population, it must be remembered that such cases are nearly confined to one sex, and that not the one which directly contributes to population. As illustrations of these positions the following table and explanatory remarks are submitted:

Statement showing the sexes and ages of 245,336 immigrants who arrived at New York, Boston, and New Orleans during the year ending September 30, 1850, compared with the same number of native white inhabitants of the United States.

	IMMIGRANTS.		NATIVE INHABITANTS.	
	Number.	Per cent. of the whole number.	Number.	Per cent. of the whole number.
Children under 10 years of age	32,184	13.12	77,771	31.70
Persons over 40 years	22,996	9.37	36,967	15.17
Number of both classes	55,180	22.49	114,822	46.87
Number of females	101,021	41.14	120,000	48.88
Number of females between 15 and 40 years ..	68,253	27.82	48,850	19.89
Proportion of the above to whole number of males and females		67.50		40.70

This table discloses some facts which certainly have an important bearing upon the question of the relative progress of our native and immigrant white population. Of native inhabitants, it is seen that very nearly half are between those ages subject to the most fatal diseases, while of the foreign born considerably less than one-quarter fall in those divisions. And although the proportion of immigrant females to males is only as 41.14 to 48.86, yet the capacity of these females to produce accessions to the population is, when compared with a like number of American females indiscriminately taken, as 58.29 to 41.71. Their superiority, in this respect, is, statistically speaking, 16.58 per cent. This fact of course insures a greater rapidity of natural increase in

that proportion. If we estimate that the influence of the smaller ratio of children and aged persons among immigrants is equal to an advantage of 3.42 per cent. in the rate of their increase, which is a moderate estimate, we shall find that, under the ordinary rules of procreation and mortality, our European population should multiply 20 per cent. faster than the native white inhabitants. But we must make some allowance for the excessive mortality assumed to prevail among the former before acclimation, which may be supposed to reduce this greater rapidity of advancement by about five per cent. And we may presume that it will cease altogether with the decade in which the immigrants arrive; because after that term the advantage from the greater number of child-bearing women will be almost annihilated, and the counteractive circumstance of the smaller proportion of girls at the time of arrival will begin to produce its effect in checking increase.

These reasons are sufficient to authorize the assumption that immigration has no other effect upon the progress of our population than is indicated by the absolute addition of the numbers which arrive, and their natural increase within the decennial term of their arrival. After that period it is proper to consider them as a part of the American race.

In correcting the statement of 1851, an error was discovered in the table of immigration from 1840 to 1850, caused by the transposition of a figure. The statement for the year 1849 was 296,610, increasing the aggregate for the decennial term by 27,000.

The statement in the report of 1851, that the number of immigrants from Europe passing into the United States through Canada from 1840 to 1850 was balanced by those emigrating to that province through the United States, so that the total addition to our population from this source was represented by the arrivals at our seaports, has been disputed, but is amply confirmed by a searching investigation.

From 1831 to 1842, the population of the two Canadas increased from 797,972 to 1,142,000; being a gain of 344,028 in eleven years, or 43.2 per cent. The natural increase of population in Canada is supposed to be a little greater than in the United States; and for these eleven years it was about 30 per cent., or 239,391; leaving to be accounted for by immigration 104,637. During these eleven years there sailed from the ports of Great Britain 356,305 emigrants for the North American provinces. Of these, about one-eighth, or 44,000, are supposed to have landed and remained in the eastern provinces, leaving for Upper and Lower Canada 312,000. We may suppose that 8 per cent. of these died before 1842, leaving 287,000 to be added to its population; but it seems that but about 104,000 were so added, and it follows that the remaining 183,000 emigrated to the United States. That number is 16,000 in excess of the estimate first adopted for our table, which has been corrected in the present edition.

A Census of Canada was again taken in 1852, and the aggregate population was found to be 1,842,000. Assuming the natural increase for the ten years to have been 27 per cent.—that of the United States being 25 per cent.—we have a gain by that means of 308,340. The actual increase being 700,000, there remains to be accounted for by immigration 392,000. There sailed from Great Britain for her Ameri-

can provinces during the ten years, (the two last being estimated,) 417,000 emigrants. Deducting one-eighth for the eastern provinces, and 8 per cent. for deaths within the term, amounting to 85,000, and we have for the total immigration into Canada for the period 332,000. It thus appears that there is a surplus of 60,000 inhabitants in Canada to be by some means accounted for. They could have only come from the United States. And as the number of natives of the United States in Canada, in 1852, was only about 12,000 in excess of those settled there in 1842, it is shown that at least 48,000 foreign emigrants went from the United States into Canada—more than came from Canada into the Union.