

REPORT

ON

STEAM NAVIGATION

IN THE

UNITED STATES.

BY

T. C. PURDY,  
SPECIAL AGENT.

# TABLE OF CONTENTS.

	Page.
LETTER OF TRANSMITTAL .....	v
CHAPTER I.—HISTORY OF STEAM NAVIGATION IN THE UNITED STATES.	
THE EARLY INVENTORS .....	1-4
RECORDS OF CONSTRUCTION .....	4, 5
Recapitulation .....	5
LOCAL INTERESTS .....	5-7
Report of the Secretary of the Treasury in 1838 .....	5, 6
Report of the Secretary of the Treasury in 1851 .....	6, 7
INSPECTIONS OF STEAM VESSELS .....	7
UNITED STATES AND FOREIGN TONNAGE .....	7, 8
GROUP I.—NEW ENGLAND STATES .....	9-11
Building in the New England states .....	11
GROUP II.—NORTHERN LAKES .....	11, 12
Building on the northern lakes .....	11, 12
Propellers .....	12
Memoranda .....	12
GROUPS III, IV, VI.—OHIO AND MISSISSIPPI RIVERS .....	12-17
Construction on the western rivers .....	13, 14
Upper Mississippi .....	14
Traffic at Saint Louis .....	15, 16
Traffic at Saint Paul .....	16, 17
GROUPS V, VIII.—MIDDLE AND SOUTH ATLANTIC STATES .....	17-21
The first steamer on the Delaware .....	17, 18
The first steamers on the Potomac .....	18
Ocean steam navigation .....	18, 19
Building on the Atlantic coast .....	20, 21
GROUP X.—UPPER MISSOURI RIVER .....	21
GROUP IX.—PACIFIC COAST .....	22-31
Pacific coast inspection .....	25
Inspections at San Francisco .....	26
Construction on the Pacific coast .....	26
Steam on the Colorado river .....	26, 27
History of steam navigation in Oregon .....	27-31
The lower Willamette and the Columbia rivers .....	27
Upper Willamette river .....	28
The middle Columbia .....	28, 29
Upper Columbia and Snake rivers .....	29, 30
CHAPTER II.—UNITED STATES INTERESTS.	
SUMMARY—MERCHANT MARINE .....	32-43
Classes and averages on United States waters .....	33, 34
GROUP I.—SUMMARY—NEW ENGLAND STATES .....	34
GROUP II.—SUMMARY—NORTHERN LAKES .....	35, 36
GROUP III.—SUMMARY—UPPER MISSISSIPPI RIVER .....	36, 37
GROUP IV.—SUMMARY—OHIO RIVER .....	37-40
GROUP V.—SUMMARY—MIDDLE STATES .....	40
GROUP VI.—SUMMARY—LOWER MISSISSIPPI .....	41
GROUP VII.—SUMMARY—GULF STATES .....	42
GROUP VIII.—SUMMARY—SOUTH ATLANTIC COAST .....	42
GROUP IX.—SUMMARY—PACIFIC COAST .....	42
GROUP X.—SUMMARY—UPPER MISSOURI RIVER .....	42, 43

TABLE OF CONTENTS.

CHAPTER III.—STATISTICAL TABLES.

	Page.
MERCHANT STEAM MARINE.....	44-59
TABLE I.—UNITED STATES INTERESTS—MERCHANT STEAM CRAFT.....	44
TABLE II.—UNITED STATES WATERS—MERCHANT STEAM TONNAGE AND TRAFFIC.....	44, 45
TABLE III.—STATE WATERS.....	45
TABLE IV.—CANAL INTERESTS.....	45
TABLE IV.—GROUP INTERESTS.....	46-48
Group I.—New England states.....	46
Group II.—Northern lakes.....	46
Group III.—Upper Mississippi river.....	46
Group IV.—Ohio river.....	46
Group V.—Middle states.....	47
Group VI.—Lower Mississippi river.....	47
Group VII.—Gulf of Mexico.....	47
Group VIII.—South Atlantic coast.....	47
Group IX.—Pacific coast.....	47
Group X.—Upper Missouri river.....	48
TABLE VI.—STATE INTERESTS.....	48-59
Maine.....	48
New Hampshire.....	48
Vermont.....	49
Massachusetts.....	49
Rhode Island.....	49
Connecticut.....	50
Michigan.....	50
Wisconsin.....	50
Illinois.....	51
Ohio.....	51
Minnesota.....	51
Iowa.....	52
Missouri.....	52
West Virginia.....	52
Kentucky.....	52
Indiana.....	53
New York.....	53
New Jersey.....	54
Pennsylvania.....	54
Delaware.....	54
Maryland.....	55
District of Columbia.....	55
Tennessee.....	55
Arkansas.....	55
Mississippi.....	56
Louisiana.....	56
Texas.....	56
Alabama.....	56
Florida.....	57
Virginia.....	57
North Carolina.....	57
South Carolina.....	57
Georgia.....	57
California.....	58
Dakota territory.....	58
Oregon.....	58
Washington territory.....	58
Nebraska.....	59

CHAPTER IV.—TONNAGE TABLES.

TABLE VII.—MERCHANT TONNAGE OF THE UNITED STATES.....	60, 61
TABLE VIII.—STEAM TONNAGE OWNED BY THE UNITED STATES GOVERNMENT.....	62
SUMMARY OF THE TONNAGE OF THE UNITED STATES.....	62

## LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,  
CENSUS OFFICE,  
Washington, D. C., March 1, 1883.

SIR: I have the honor to transmit herewith statistics of steam navigation and a sketch of its progress in this country.

In presenting this report I desire to give the names of my authorities in some instances, and to acknowledge thereby the valuable assistance of individuals who have materially aided me in gathering and compiling the information contained in these pages, giving due credit, at the same time, for the courtesies shown me by the steamboat owners in general. I wish, first, to thank the gentlemen comprising the United States steamboat inspection service. To James A. Dumont, supervising inspector-general, I am indebted for many favors in examining the records of his office.

To the local United States inspectors, comprising the several boards throughout the country, I am indebted for a valuation of each steamer in their districts, addresses of owners, and information of value upon many points relating to steam navigation, which, from their close business relations to the steamboat interests, they were able to give with authority. The clerks to the several boards of inspectors have aided me in many ways, and their service has been invaluable.

N. B. Walker, esq., chief of the tonnage division in the office of the register of the treasury, gave me much aid and made valuable suggestions. Official tonnage statements and the records of steamboat construction are from this source.

Mr. John H. Charles, superintendent of the Fort Benton Transportation Company, of Sioux City, Iowa, furnished much information about traffic on the Upper Missouri, and gave me an historical sketch of navigation in that region.

For an historical sketch of steamboating in the New England states I am indebted to Edward J. Howard, esq., secretary and superintendent of the Boston board of trade, and to William H. Hill, jr., treasurer of the Boston and Bangor Steamship Company. Mr. Theodore Wygant, secretary of the Oregon Railway and Navigation Company, kindly furnished a sketch of steamboating on the Columbia river, originally compiled by Thomas B. Merry, esq., of the *Inland Empire*.

J. D. Parker, esq., and Captain G. W. Thompson, both of the Memphis and Ohio River Packet Company, and Messrs. Paris C. Brown and S. F. Covington, of Cincinnati, have shown much interest in my work and materially aided me in many ways. E. T. Evans, esq., manager of the Lake Superior Transit Company, furnished some interesting tables relating to the consumption of fuel on the lakes, and W. D. Robinson, esq., general inspector of the Inland Lloyds at Buffalo, gave some rules and records of the value of tonnage that proved of service.

I wish in this connection to acknowledge the valuable service of those who assisted me in the Census Office: Mr. R. C. Getchell, acting chief of the division, beside aiding me, has shown a uniform courtesy and appreciation that has facilitated work in his division. Mr. Edward P. Masi did excellent work in securing returns from the steamboat owners, and the services of Miss A. M. Hamilton, as an expert accountant, were invaluable to me.

Very respectfully, yours,

T. C. PURDY,  
*Special Agent.*

Hon. CHARLES W. SEATON,  
*Superintendent of Census,*  
Washington, D. C.

## CHAPTER I.—HISTORY OF STEAM NAVIGATION IN THE UNITED STATES.

### THE EARLY INVENTORS.

The events that led up to the perfection of Fulton's first steamboat, the *Clermont*, in 1807, were long in maturing.

In England, as far back as 1578, a man by the name of Bourne obtained a patent for a boat to be propelled by means of wheels at the sides. David Ramsay in 1630 procured letters for a method of making ships and barges to go against wind and tide. Other methods of propulsion were patented by Thomas Grent in 1632, Francis Lin in 1637, Edward Ford in 1640, the Marquis of Worcester in 1667, and Thomas Toogood in 1661. In 1682 a horse-boat moved by wheels at the side was tried at Chatham, and used as a tow-boat. In 1730 Dr. John Allen proposed to move a boat by pumping in water and ejecting it from the stern, and Jonathan Hulls produced a plan for navigating a tow-boat by a stern-wheel worked by steam. It does not appear, however, that any boat was ever built by Hulls.

In France the Count Auxiron made some experiments on the Seine in 1774, and they were repeated the next year with more success. (a) In 1782 De Jouffroy, on the Saône, moved a boat 140 feet long by a steam-engine attached to paddle-wheels on the sides. (a)

This brings us down to the date of the first experiments in this country. During the closing years of the last century James Rumsey, of Virginia, and John Fitch, of Pennsylvania, had a long war of pamphlets upon the merits of their invention and claims to priority. In 1786 Fitch moved a skiff-boat with a 3-inch cylinder. In 1787 bills granting exclusive rights in the steamboat to John Fitch for fourteen years were passed by the legislatures of Pennsylvania, Delaware, New York, and Virginia. In August of this year a second boat was built by Fitch for machinery with a 12-inch cylinder, and several passages were made between Philadelphia and Burlington at the rate of about 4 miles per hour. This boat, as shown in Fig. 1, was driven by paddles, six on a side; as six came out of the water six more entered, making a stroke of some 11 feet for each revolution of the engine. Another boat for an engine with an 18-inch cylinder was ready for trial in August, 1789. Changes in the machinery which were found to be necessary occupied the time till the spring of 1790, when the boat was run regularly and advertised to carry passengers between Philadelphia and Burlington, making an average speed of  $7\frac{1}{2}$  miles an hour, and running over 2,000 miles that season. This boat was driven by paddles at the stern, as shown in Fig. 2. It did not, however, prove a paying project, and the company withdrew from the line after this season. Regular patents were issued to Fitch and to Rumsey by the United States authorities on August 26, 1791; and to Jehoshaphat Starr, of Connecticut, April 28, 1797; Edward West, of Kentucky, July 6, 1802; Dr. William Thornton, of Washington, District of Columbia, January 16, 1809; Daniel French, of New York, October 12, 1809; John Stevens, of New Jersey, January 3, 1810; Samuel Bolton, of Philadelphia, November 1, 1810; Michael Morrison, of Boston, January

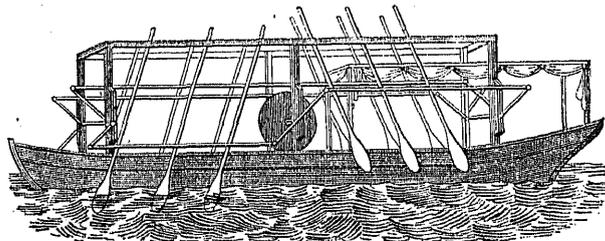


FIG. 1.—FITCH'S SECOND BOAT.

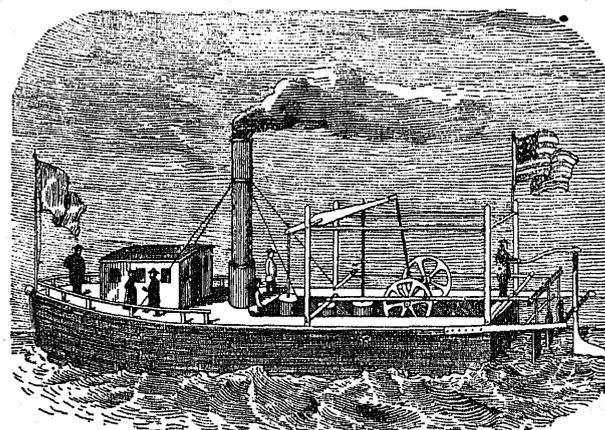


FIG. 2.—FITCH'S THIRD BOAT.

17, 1811; Robert Fulton, of New York, February 9, 1811. In 1796 Fitch, on his return from Europe, placed a small boat on the Collect pond in New York, which was worked by a screw-propeller, but it was a very primitive affair. The boiler was a ten- or twelve-gallon pot, with a plank lid. The cylinder was of wood, barrel-shaped on the outside, and strongly hooped. It worked, however, and the boat was propelled once or twice around the pond before the steam was exhausted. Fitch then went to Kentucky, where he met with little encouragement in his project of establishing his inventions on the western rivers. His health failed, but he still kept at work upon his invention, and made a model boat about three feet long, which was still in existence in 1854 at Saint Louis. This boat was provided with side wheels, and was a working model. This was his last work. Disappointed and neglected, he terminated his life at Bardstown, Kentucky, in 1798, by taking an overdose of opium, which he had saved for that purpose from prescriptions of his physician.

James Rumsey, of Shepherdstown, Virginia, it appears, constructed a boat in 1784 propelled by a series of "setting-poles", which was exhibited before General Washington at Bath, in Berkeley county, Virginia, and he

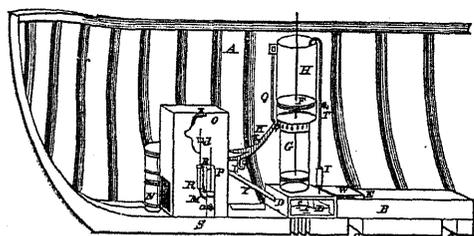


FIG. 3.

received a certificate of its efficiency from the General dated "this 7th day of September, 1784". The character of this boat is, however, somewhat doubtful. Four years later Rumsey constructed a boat (see Fig. 3) upon a plan which might have been suggested by or borrowed from Thomas Toogood, Dr. John Allen, or Dr. Franklin. It consisted in the employment of steam to pump water into the bottom of the boat and force it out again at the stern, the resistance moving the boat forward. The question in dispute with Fitch was whether this first "mechanical" or "pole boat" was operated by steam. Rumsey could not operate his boat in this country on account of Fitch's patent, and he went to Lon-

don, where he took out several patents, and made some experiments on the Thames. He died in England in 1793.

Beside "A Short Treatise on the Application of Steam", published in 1788, Rumsey left several pamphlets, and among them one entitled "Explanation of a steam-engine, and the method of applying it to propel a boat. Invented by James Rumsey, of Berkeley county, Virginia. Printed by Joseph James, Philada. MDCCLXXXVIII. Entered 30th Aug., 1788, in the prothonotary's office of the court of common pleas, at Philad". It contained a sectional engraving of his machinery, as shown in Fig. 3. I copy the description:

- A, a section of a small part of a boat, with the whole of the machinery.
- S, the keelson of the boat.
- B, part of the trunk, through which the water is forced out at the stern.
- C C, valves for the admission of water into the trunk at its bottom.
- c c c, valves to admit water into the box D D; which water follows the piston F of the pump. The piston is carried up by means of the rod G, which connects both of the pistons F F.
- D D, a box to which the lower cylinder is firmly fastened, which box is seen open for the advantage of representing the valves c c c.
- E, a valve on the top of the trunk, near the box D D, to admit air, which follows the water that is put in motion by the strokes of the engine, and lets it pass off freely, while the water rises gradually into the trunk through the valves C C, at its bottom, and is then ready to resist the next stroke of the engine.
- F H, the upper cylinder of the steam-engine.
- F G, the lower cylinder.
- H, a rod, screwed on to the top of the bolt G, which rod communicates with the apparatus for opening and shutting the cock K. This apparatus it is not thought necessary to represent.
- I, a swelled cup in the pipe, through which water is thrown, by every stroke of the engine, into the upper cylinder upon the piston F.
- K, a cock at the junction of the pipes, communicating from the boiler with the cylinder and condenser, which admits the steam under the piston of the upper cylinder. The piston is then carried up, and, by the communication of the rod H with the cock K, changes the operation, and passes off the steam for condensation into the condensing-vessel N. The atmosphere then forces down the piston, as it is represented in the plate, by which means the water is forced through the trunk B.
- L, a puppet valve, communicating with the boiler and acting as a regulator; and must be weighted to determine the requisite pressure.
- M, the furnace, in which the pipe boiler is to be placed.
- O, the gauge cock and spiral worm, connecting the forcing-pump P and the air-vessel R with the boiler.
- a, a valve, which admits the water to rise into the barrel of the force-pump P, and prevents it from returning while it is forced through the valve V into the air-vessel R, where it lies under a given pressure upon the valve a.
- Q, a pipe, leading from the cup U, fixed to the edge of the upper cylinder, from which it receives some of the surplus water which is passed through the pipe to the collar V, through which a communicating bolt, G, is drawn; and by this means the admission of air is prevented.
- T, a cock to regulate the quantity of water forced up into the upper cylinder.
- W, a valve at the insertion of the trunk B into the box D D, which falls when the stroke of the piston is made and prevents the return of the water or air into the box D D from the trunk B, while the water follows the piston F, through the valve c c c, into the box D D, in order to make the next stroke.
- X, the mouth of the furnace.
- Y, a pipe leading from the top of the condensing-vessel to the box D D every time the piston is carried up; and it has a valve on the box D D which prevents the water from being forced back again.

A chronological list of these early experiments that were in a measure successful is as follows:

John Fitch, on July 27, 1786, moved a skiff on the Delaware, working paddles by steam.

James Rumsey, on December 3, 1787, moved a boat on the Potomac by pumping in water at the bow and ejecting it at the stern of the boat. Rumsey's boat of 1784 was evidently a "mechanical" boat, without steam.

Nathan Read, in 1789, constructed an experimental boat at Salem, Massachusetts, to which paddle-wheels were attached, and designed to be worked by his high-pressure steam-engine.

Captain Samuel Mowry, in 1790, propelled a boat by steam on the Connecticut river.

William Longstreet, in 1791, worked a boat by steam on the Savannah river, at Augusta, Georgia.

Elijah Ornsbee, in the autumn of 1792, propelled a boat by goose-foot paddles, worked by steam, at Providence, Rhode Island.

Other experiments, which were to some extent practicable, were tried in this country.

Nicholas I. Roosevelt, of New York, in 1798, John Stevens, of New Jersey, in 1804, and Oliver Evans, of Pennsylvania, in 1804, all demonstrated the applicability of steam to navigation, the latter gentleman making some very successful experiments with a boat on the Delaware, which he called the *Eruktor Amphibolis*. Fig. 4 represents this boat. He says, in describing his experiments:

To show that both steam-carriages and steamboats were practicable (with my steam-engine), I first put wheels to it, and propelled it by the engine a mile and a half, and then into the Schuylkill, although its weight was equal to 200 barrels of flour.

I then fixed a paddle-wheel at the stern, and propelled it by the engine down the Schuylkill and up the Delaware 16 miles, leaving all the vessels that were under sail full half way behind me (the wind being ahead), although the application was so temporary as to produce great friction, and the flat most illy formed for sailing; done in the presence of thousands.

Some of the most successful experiments at this early date were, however, made in Scotland. Patrick Miller, of Dalwinston, a wealthy gentleman, much interested in improvements in navigation and saving of life at sea, made some experiments on the Firth of Forth in 1787, not, however, with steam, but by the application of the power of men. Steam was suggested to him by James Taylor. William Symington, an ingenious young man, was employed to apply steam power to his double boat with a paddle-wheel in the middle. The experiment was not satisfactory to Mr. Miller, though it was fairly successful, and the engines were taken out of the boat. In 1801 Symington constructed the *Charlotte Dundas*, the most perfect steamboat that had thus far been built. Woodcroft in his history says of this boat—

Thomas, Lord Dundas, of Kerse, who was acquainted with the experiments that had been made by Miller, and who was an extensive proprietor in the Forth and Clyde canal, employed Mr. Symington to make a series of experiments on steamboats, to enable him to substitute them for horses, then employed to draw the vessels on the canal. These experiments occupied from June, 1801, to April, 1803, and cost some £7,000. The result of these experiments was the production of a practical steamboat, named the *Charlotte Dundas* in honor of his lordship's daughter. This vessel might from the simplicity of the machinery have been at work to this day with such ordinary repairs as are now occasionally required to all steamboats. In this vessel there was an engine with the steam acting on each side of the piston (Watt's patent), working a connecting-rod and crank (Pickard's invention) and the union of the crank to the axis of the Miller improved paddle-wheel (Symington's invention).

In 1804 Colonel John Stevens, of Hoboken, New Jersey, propelled a small vessel by means of a high-pressure engine with a sectional boiler and *double screws*, at the rate of seven miles per hour for a short distance, and it is surprising that, considering the characteristic energy of his family, he should have abandoned the path on which he appears to have so fairly started. The machinery of this boat is still preserved at the Stevens Institute of Technology at Hoboken, New Jersey. It was placed in a hull in 1844 and produced a speed of 8 miles per hour.

Robert Fulton, about the time that Rumsey and Fitch were making their experiments, was studying under West, the great artist, in England. The Duke of Bridgewater induced the young artist to adopt the profession of civil engineer, and he had in the meantime become acquainted with Earl Stanhope, who was engaged on a scheme of steam navigation in which Fulton became interested. At Birmingham Fulton met Watt, who had just succeeded in his great improvement of the steam-engine, with which he made himself familiar. He made several inventions and published his treatise on canal navigation in 1796. The next year he took up his residence in Paris, where he afterward became acquainted with Robert R. Livingston, United States minister to France. Mr. Livingston having

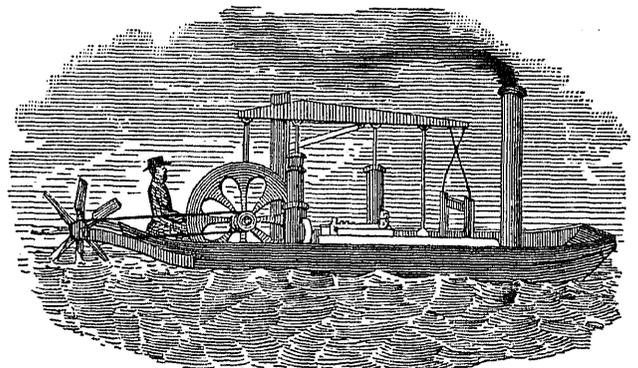


FIG. 4.—THE ERUKTOR AMPHIBOLIS.

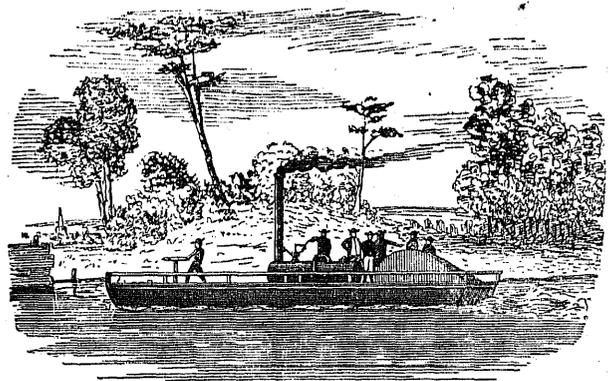


FIG. 5.—SYMINGTON'S BOAT.

STEAM NAVIGATION IN THE UNITED STATES.

secured Fitch's patent to navigate the waters in New York, by an act of the legislature in 1798, associated Fulton with him, agreeing to furnish funds for an experiment, and contracted for the introduction of steamers into the United States if the experiment proved successful. In 1803 Fulton constructed a working model of his steamboat and also built a vessel, 66 feet by 8 in width, at Paris. It did not move with the speed that was desired; but he was convinced of the practicability of his inventions, and ordered of Boulton and Watt, in England, an engine with a 24-inch cylinder and 4-foot stroke, with a 20-foot boiler, 7 feet deep by 8 feet wide. This engine arrived in New York in 1806, Fulton returning to this country in the same year. He planned for this machinery a hull that was completed in 1807, and the steamboat Clermont made her first successful trip to Albany on Monday, August 17, making an average speed of 5 miles per hour. In the course of the coming winter she was lengthened 10 feet, making her 140 feet keel by 16½ feet beam, and she thereafter made regular trips to Albany, being the first steamboat ever made commercially successful. Almost simultaneously with Fulton's Clermont, John Stevens, of Hoboken, brought out the Phoenix, a side-wheel steamer, having hollow water-lines, and afterward provided with feathering paddle-wheels. This steamer could not ply on the Hudson on account of Livingston's patents, and she was taken by sea around to the Delaware river. This was the first sea voyage ever made by a steamer. From this time on the growth of steam navigation was rapid.

Fulton and Livingston brought out at New York the Car of Neptune in this same year; the Raritan in 1808; the Paragon in 1811; the Camden and the Fire Fly in 1812; the Richmond, the Washington, the Nassau, the Vesuvius, and the Fulton in 1813 and 1814. Double-keel ferry-boats, for the Hudson river, were constructed about this time, called the Jersey and the York, also the Nassau, for the East river. The Nassau ran in 1814 between New York and Brooklyn.

RECORDS OF CONSTRUCTION.

The early records of steamboat construction are somewhat incomplete, but the register of the treasury, in his report for the year 1812, mentions for the first time the construction of four steamers. From some recent compilations of the number and tonnage of steamers and sail vessels built in the country, made in the office of the register of the treasury, the following table of construction since 1812 has been compiled. Previous to that date the number and the tonnage have been estimated—based, however, on historical statements—so that the table may be regarded as being as far complete as it was possible to make it, embracing all the facts and figures brought out by recent investigations of the old records. In the right-hand column the recorded annual loss of life is given, as reported by the inspection service and from official reports:

Year.	Number.	Tonnage.	Recorded annual loss of life.	Year.	Number.	Tonnage.	Recorded annual loss of life.	Year.	Number.	Tonnage.	Recorded annual loss of life.
1807-11.....	7	1,324.00		1835.....	72	10,769.76	98	1858.....	242	65,374.34	241
1812.....	4	457.08		1836.....	145	23,218.57	131	1859.....	177	35,305.45	194
1813.....	7	1,420.66		1837.....	158	33,455.00	682	1860.....	275	69,370.07	426
1814.....	2	711.65		1838.....	105	24,158.09	585	1861.....	266	60,986.36	81
1815.....	5	954.65		1839.....	164	24,897.59	91	1862.....	183	55,449.17	284
1816.....	17	3,518.89	11	1840.....	87	14,685.51	224	1863.....	360	94,233.67	85
1817.....	10	1,233.28	27	1841.....	108	23,543.81	243	1864.....	520	147,499.83	182
1818.....	*23	5,267.29	1	1842.....	140	24,550.15	144	1865.....	411	145,606.35	2,059
1819.....	28	7,290.74	15	1843.....	79	13,837.07	59	1866.....	353	125,183.72	745
1820.....	22	3,610.58	5	1844.....	163	32,030.58	278	1867.....	179	72,010.33	589
1821.....	12	1,419.10		1845.....	163	33,650.38	213	1868.....	236	63,940.00	376
1822.....	16	2,222.31		1846.....	225	46,359.71	108	1869.....	270	65,065.99	557
1823.....	23	3,099.16	61	1847.....	197	50,230.02	550	1870.....	290	70,620.92	180
1824.....	38	5,946.28	31	1848.....	175	52,526.01	319	1871.....	302	87,842.49	361
1825.....	41	6,917.65	50	1849.....	215	43,018.01	341	1872.....	292	62,209.65	306
1826.....	66	12,279.30	13	1850.....	197	51,258.35	764	1873.....	402	88,010.66	222
1827.....	52	8,981.70	12	1851.....	245	78,326.47	247	1874.....	404	101,929.92	182
1828.....	34	6,085.03	16	1852.....	268	85,534.33	1,038	1875.....	323	62,459.84	387
1829.....	55	11,192.18	35	1853.....	280	95,155.07	45	1876.....	338	69,251.91	120
1830.....	48	7,008.89	125	1854.....	284	88,820.82	222	1877.....	265	47,514.51	191
1831.....	35	5,325.44	52	1855.....	246	72,700.32	1,034	1878.....	334	81,859.69	233
1832.....	100	15,401.13	188	1856.....	232	65,239.34	14	1879.....	335	80,361.35	148
1833.....	65	10,734.25	155	1857.....	272	74,459.52	213	1880.....	348	78,853.70	320
1834.....	88	13,057.30	93								

\* The Savannah, of 342 tons, included.

# HISTORY OF STEAM NAVIGATION.

## RECAPITULATION.

Years.	Number.	Tonnage.	Recorded annual loss of life.
Grand total .....	12, 136	3, 035, 077. 24	17, 001
From 1807 to 1820, inclusive .....	128	25, 797. 77	59
From 1821 to 1830, inclusive .....	385	65, 211. 60	343
From 1831 to 1840, inclusive .....	1, 015	175, 697. 73	2, 302
From 1841 to 1850, inclusive .....	1, 662	371, 034. 69	3, 024
From 1851 to 1860, inclusive .....	2, 521	730, 355. 33	3, 674
From 1861 to 1870, inclusive .....	3, 082	900, 686. 40	5, 129
From 1871 to 1880, inclusive .....	3, 343	766, 293. 72	2, 470

## LOCAL INTERESTS.

For the past seventy years steam navigation has advanced with giant strides, overstepping several times the limits assigned it. Outside of the wonderful inventions in construction and machinery, the most remarkable features in connection with its progress in this country, after Fulton's success on the Hudson in 1807, have been its rapid growth on the western rivers and the nerve and energy displayed in its introduction on the Pacific coast.

Up to and including 1820, on the western rivers we find that there had been constructed 71 steamers, measuring 14,207.53 tons, while at this same date there are records of only 52 steamers, measuring 10,564.43 tons, built on the Atlantic coast, exclusive of New England, and 4 steamers, measuring 921.84 tons—including 1 steamer of 298.57 tons, built on Lake Champlain—on the lakes, and 1 of 218.84 tons at Mobile. These figures include all the boats constructed after the Clermont, in 1807, as far as their records could be found. No official statements were made previous to 1812, and it was found necessary to estimate the tonnage of a few of the first steamers.

Up to and including 1830 we find that there had been built on the western rivers 296 steamers, measuring 51,506.65 tons, as against 183 steamers, measuring 33,667.88 tons, on the Atlantic coast, exclusive of New England, and 11 steamers, measuring 2,208.64 tons, on the northern lakes.

Up to 1840 there had been constructed in the United States 1,528 steamers, measuring 266,707.10 tons.

## REPORT OF THE SECRETARY OF THE TREASURY IN 1838.

In July, 1838, the President of the United States approved an act of Congress providing for the inspection of steamboats, and in December of that year the Secretary of the Treasury, in a letter to Congress, made the following statements of the steam tonnage then in each state in the Union, as far as he was able to get returns. It is somewhat incomplete, but sufficiently accurate to indicate the growth of this great interest:

State.	Returns to December, 1838.		Return September 30, 1837.	State.	Returns to December, 1838.		Return September 30, 1837.
	No. of vessels.	Tonnage.	Tonnage.		No. of vessels.	Tonnage.	Tonnage.
Maine .....	8	1, 609	.....	Mississippi .....	No returns..		.....
New Hampshire .....	1	215	.....	Arkansas .....	No returns..		.....
Vermont .....	4	903	.....	Louisiana .....	30	4, 686	54, 421
Massachusetts .....	12	1, 443	171	Tennessee .....	No returns..		5, 193
Rhode Island .....	2	698	965	Illinois* .....	.....		.....
Connecticut .....	19	4, 103	2, 641	Indiana* .....	.....		.....
New York .....	140	29, 708	24, 431	Kentucky .....	41	8, 356	1, 714
New Jersey .....	21	3, 757	444	Iowa .....	No returns..		.....
Pennsylvania .....	184	18, 243	10, 331	Wisconsin† .....	.....		.....
Delaware .....	3	494	373	Missouri .....	42	7, 907	3, 668
Maryland .....	19	6, 800	7, 135	Ohio .....	79	15, 396	12, 375
District of Columbia .....	5	801	1, 477	Michigan .....	13	2, 611	2, 193
Virginia .....	16	1, 970	1, 667	United States Government:	.....		.....
North Carolina .....	11	2, 014	521	Navy Department .....	1	} 900	.....
South Carolina .....	22	4, 794	4, 715	War Department .....	4		.....
Georgia .....	29	4, 273	4, 521	Engineer Department .....	9		.....
Florida .....	17	1, 974	1, 194	Total ascertained .....	700	‡ 126, 718	153, 546
Alabama .....	18	2, 703	4, 396				

\* No returns, except in part with Missouri and Kentucky.

† No returns, except in part with Michigan.

‡ In 58 of the 700 boats the tonnage, not being returned, is estimated at 10,800 tons more, making an aggregate of 137,518 tons in the ascertained boats.

## STEAM NAVIGATION IN THE UNITED STATES.

Of the whole number of steamboats respecting which returns have been received, 351 were in use on the waters of the Atlantic and Gulf of Mexico, 64 on the great northern lakes, and 285 on the waters of the Mississippi valley, in 1838, as follows:

	High pressure.	Low pressure.	Not known.
Total .....	408	254	38
Atlantic and Gulf of Mexico .....	92	222	37
Northern lakes .....	32	31	1
Mississippi valley .....	284	1	.....

## TONNAGE, SO FAR AS RETURNED.

	High pressure.	Low pressure.	Total.
Total .....	61,903	64,770	126,673
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
Atlantic and Gulf of Mexico .....	10,477	55,469	65,946
Northern lakes .....	7,986	9,301	17,287
Mississippi valley .....	43,440	.....	43,440

No returns were made of the tonnage of 45 boats on the waters of the Atlantic, nor of the tonnage of 9 boats on the Mississippi and the Ohio.

The character of the engine of one small boat on the northern lakes is not mentioned in the returns. This would require an addition to the tonnage of the 54 ascertained boats, estimated at 200 tons each, of 10,800 tons, making a probable aggregate, in all the ascertained boats, equal to 137,473 tons.

## HORSE-POWER, SO FAR AS RETURNED.

	High pressure.	Low pressure.	Total.
Total .....	21,771	13,338	35,109
Atlantic and Gulf of Mexico .....	2,927	10,391	13,318
Northern lakes .....	2,910	2,947	5,857
Mississippi valley .....	15,934	.....	15,934

Estimated for 213 boats, in which the horse-power was not returned, at 70 for each boat..... 14,910  
 Making an aggregate of horse-power in the 700 boats returned equal to..... 50,019  
 Add for 100 boats considered not to be returned, but whose horse-power is estimated at 70 each..... 7,000

Ascertained and estimated total of horse-power in boats..... 57,019

No returns of the power of the engines in 139 boats on the waters of the Atlantic and Gulf of Mexico, in 1 boat on the northern lakes, and in 73 boats in the valley of the Mississippi.

The tonnage of boats when not returned accurately has been estimated on an average at 200 tons.

Up to and including 1838 there had been built in the United States 1,279 steamers, measuring 226,510 tons. It appears, therefore, that only about one-half of the vessels were in existence at that date, showing an abandonment of 45 per cent., or 19 per annum for the thirty years, as against a construction of an average of 42 per annum for the same period.

## REPORT OF THE SECRETARY OF THE TREASURY IN 1851.

The losses by accidents for the succeeding decade were very heavy. The inspection laws were revised and the present system adopted about 1852. Previous to this date Congress again called upon the Secretary of the Treasury for some statements of the steam tonnage of the country. The statistics were for the year ending June 30, 1851,

and show that there were at that date 1,390 steamers, with a tonnage of 417,225.93 tons. The following table, compiled from the report of the Secretary of the Treasury, shows the number, tonnage, crews, and passenger traffic in 1851:

Description of vessel.	Number.	Tonnage.	Number of officers, crew, etc.	Pressure.		Passengers carried annually.
				High.	Low.	
Grand total.....	1,390	417,225.93	29,377	930	460	39,204,691
COAST.						
Total.....	625	212,500.86	11,770	215	410	33,342,846
Ocean steamers.....	96	91,475.60	4,548	3	93	190,993
Ordinary steamers.....	382	90,738.40	6,311	152	230	3,782,572
Propellers.....	67	12,245.73	542	50	17	53,705
Steam ferries.....	80	18,041.13	369	10	70	29,315,576
INTERIOR.						
Total.....	765	204,725.07	17,607	715	50	5,861,845
Ordinary steamers.....	663	184,262.32	16,576	615	48	2,714,874
Propellers.....	52	15,729.12	817	50	2	44,440
Steam ferries.....	50	4,733.63	214	50	.....	3,102,531

INSPECTIONS OF STEAM VESSELS.

The growth of active steam tonnage in this country is best shown by the following table of the annual inspection of steamers. It closely represents the tonnage actually employed, for if an owner takes out a license it is presumed that the steamer goes into service. The number inspected falls short of the number reported by the customs authorities, as in their reports all tonnage, whether in service or laid up, is included:

*Statement of the number and tonnage of steamers inspected annually in the United States from 1855 to 1880, inclusive.*

Year.	Number.	Tonnage.	Year.	Number.	Tonnage.	Year.	Number.	Tonnage.
1855.....	1,073	410,013	1864*.....	1,471	520,700	1873.....	3,743	1,022,445
1856.....	.....	.....	1865.....	2,329	757,528	1874.....	3,879	1,048,747
1857.....	1,122	461,370	1866.....	2,796	951,801	1875.....	4,006	1,036,221
1858.....	1,091	415,815	1867.....	2,764	872,487	1876.....	3,947	999,744
1859.....	1,117	431,931	1868†.....	3,460	1,140,563	1877.....	4,149	897,596
1860.....	1,208	458,857	1869.....	2,948	916,988	1878.....	4,252	1,072,086
1861.....	695	286,525	1870.....	3,102	942,273	1879.....	4,416	1,133,855
1862.....	729	273,137	1871.....	3,297	925,611	1880.....	4,620	1,163,098
1863.....	933	405,000	1872.....	3,444	983,918			

\* Act of June 8, 1864, required inspection of tugs, ferries, etc.

† 15 months' inspection.

UNITED STATES AND FOREIGN TONNAGE.

On the continent of Europe steam navigation made very slow progress up to the end of the year 1836. A writer in the *New York Review* gives the number in existence there as follows:

	No. of steamers.		No. of steamers.
Denmark.....	4	France—continued:	
Sweden.....	27	Brest.....	1
Russia.....	26	Nantes.....	21
Prussia.....	3	Rochelle.....	2
Rostock.....	1	Bordeaux.....	17
Lubeck.....	2	Spain and Portugal.....	4
Hamburg.....	3	Sardinia.....	5
Amsterdam.....	3	Tuscany.....	1
Rotterdam.....	26	Naples.....	8
Antwerp and Ghent.....	3	Austria.....	6
France:		Total.....	180
Havre.....	17		

## STEAM NAVIGATION IN THE UNITED STATES.

Adding to these 180 steamers, measuring approximately 14,400 tons, 554 steamers, measuring 59,362 tons, owned in the United Kingdom in 1836, and we have a total of 734 steamers, measuring 73,762 tons, in Europe, as against an equal number at least in the United States, with an official tonnage of 145,556 tons. It may be safely stated that we led all Europe in steam tonnage up to 1840.

Comparing our merchant steam marine with that of the United Kingdom, as shown in the following tables, it will be seen that in steam tonnage we led up to 1870; and as far as the number of steamers is concerned, if we include those owned by our several departments, exclusive of the navy, we had more by thirty-nine steamers in 1880 than was owned in the United Kingdom in that year.

The following table shows the steam tonnage in the past in this country and in the United Kingdom. It is to be regretted that no record of the number of steamers in this country can be found between the years 1815 and 1867, excepting in two cases, in 1838 and 1851, where special reports were made by the Secretary of the Treasury. The following table, therefore, shows the total number and tonnage of steam vessels belonging to the United States and the United Kingdom, respectively, at the end of each year, from 1807 to 1880, inclusive:

Year.	UNITED STATES.		UNITED KINGDOM.		Year.	UNITED STATES.		UNITED KINGDOM.	
	Number.	Tonnage.	Number.	Official tonnage.		Number.	Tonnage.	Number.	Official tonnage.
1807.....	3	655.00			1844.....	273,180.00	900	113,677.00	
1808.....	4	775.00			1845.....	326,019.00	917	118,782.00	
1809.....					1846.....	347,898.00	963	131,256.00	
1810.....					1847.....	404,841.00	1,033	141,008.00	
1811.....	7	1,324.00			1848.....	427,891.00	1,118	151,429.00	
1812.....	11	1,781.03			1849.....	462,395.00	1,149	159,684.00	
1813.....	19	3,135.38			1850.....	525,947.00	1,187	168,474.00	
1814.....	21	3,846.99	1	69.00	1851.....	583,607.00	1,227	186,687.00	
1815.....			8	639.00	1852.....	643,240.00	1,272	209,310.00	
1816.....			12	947.00	1853.....	804,618.00	1,385	250,112.00	
1817.....			14	1,039.00	1854.....	676,607.00	1,524	306,237.00	
1818.....			19	2,332.00	1855.....	770,285.00	1,674	380,635.00	
1819.....			24	2,548.00	1856.....	673,077.00	1,697	386,462.00	
1820.....			34	3,018.00	1857.....	705,784.00	1,824	417,466.00	
1821.....			59	6,051.00	1858.....	729,390.00	1,926	452,468.00	
1822.....			85	8,457.00	1859.....	768,753.00	1,918	436,836.00	
1823.....		*24,879.00	101	10,361.00	1860.....	867,937.00	2,000	454,327.00	
1824.....		21,610.00	114	11,733.00	1861.....	877,204.00	2,133	506,308.00	
1825.....		23,061.00	151	15,764.00	1862.....	710,463.00	2,228	537,891.00	
1826.....		34,059.00	228	24,186.00	1863.....	575,519.00	2,298	596,856.00	
1827.....		40,198.00	253	27,318.00	1864.....	977,960.00	2,490	697,281.00	
1828.....		39,418.00	272	28,610.00	1865.....	1,067,139.00	2,718	823,533.00	
1829.....		54,037.00	267	29,501.00	1866.....	1,083,512.00	2,831	875,685.00	
1830.....		64,472.00	295	30,009.00	1867.....	1,191,880.00	2,931	901,062.00	
1831.....		69,445.00	320	32,262.00	1868.....	3,619	1,199,414.89	2,944	902,297.00
1832.....		90,814.00	348	35,283.00	1869.....	3,546	1,103,568.38	2,972	948,367.00
1833.....		101,851.00	382	38,122.00	1870.....	3,524	1,075,095.03	3,178	1,112,934.00
1834.....		122,814.00	424	43,429.00	1871.....	3,567	1,087,637.14	3,382	1,319,612.00
1835.....		122,814.00	497	52,707.00	1872.....	3,753	1,111,552.81	3,673	1,538,032.00
1836.....		145,556.00	554	59,362.00	1873.....	4,015	1,156,442.81	3,863	1,713,783.00
1837.....		154,765.00	618	69,045.00	1874.....	4,186	1,185,609.74	4,033	1,870,611.00
1838.....	1700	193,423.00	673	74,684.00	1875.....	4,235	1,168,667.63	4,170	1,945,570.00
1839.....		195,028.00	720	79,240.00	1876.....	4,320	1,172,372.28	4,335	2,005,347.00
1840.....		202,339.00	771	87,928.00	1877.....	4,395	1,171,196.39	4,564	2,139,170.00
1841.....		175,088.00	793	96,067.00	1878.....	4,472	1,167,678.26	4,826	2,316,472.00
1842.....		229,751.00	833	108,514.00	1879.....	4,569	1,176,171.56	5,027	2,511,233.00
1843.....		236,867.00	858	109,733.00	1880.....	5,139	1,221,206.93	5,247	2,723,468.00

\* Official from 1823 to 1879 inclusive; estimated previous to 1815 from historical data.

† Special report of the Secretary of the Treasury.

‡ Men employed, 56,811; average, 11 per steamer; average tonnage of steamers, 237.63.

§ Men employed, 84,304; average, 16 per steamer; average tonnage of steamers, 519.05.

## GROUP I.—NEW ENGLAND STATES.

The people of the New England states were slow to adopt the use of steam. The steamboat *Massachusetts*, owned by some capitalists of Salem, was the first steamer introduced into Boston bay. She was built at Philadelphia and measured 97.70 tons, and made her first trip from Salem to Boston on July 4, 1817. She proved a failure, and was soon withdrawn from the route. She was sent south to be sold, and was wrecked on the coast of North Carolina. The *Eagle*, of 80.52 tons, built at New London in 1817, took her place for a short time, but ran from Nantucket to New Bedford for six months of the year. In Maine waters it was not till July 7, 1823, some sixteen years after the first successful application of steam to the propulsion of vessels, that the steamer *Patent* arrived at Portland. This was the first appearance of a steamer in these waters, and at this date about 100 steamers were navigating the western rivers, and 70 at least had been built along the Atlantic coast. On May 22 of the following year the steamer *Maine* arrived at Belfast. The Kennebec Steam Navigation Company was also organized in this year, and they bought the *Patent* and put her on this line between Boston and Bath, while the *Maine* ran from the latter place to Eastport, touching at Boothbay, Owl's Head, Camden, Belfast, Sedgwick, Cranberry isles, Lubec, and Eastport, occasionally making a trip to Saint John's, New Brunswick. Thus it will be seen that as early as the spring of 1824 there was a regular line of steamers connecting the ports of Maine and Boston.

The *Patent* was built at Medford, Massachusetts, in 1821, and measured 98.33 tons. Having no hurricane deck, her cabins were all below. The ladies' cabin being in the stern, was provided with one window. The quarter-deck was clear, with seats all around. The engines and boiler were below. Like Fulton's boats, the *Patent* had a heavy balance-wheel half above decks, and an arrangement by which one or both paddle-wheels could be disconnected from the engine to assist in turning the boat or to work off steam.

The *Maine*, it is generally stated, was constructed of two schooners with beams across, and retaining the two keels. She measured 105 tons and cost about \$13,000. The running time from Boston to Portland was seventeen hours, and fares, including meals, \$5; stage fares being \$10 at that date.

Other steamers were soon put upon routes in these waters. The *Waterville*, built at Bath in 1823, commenced running on the Kennebec in 1824. The Kennebec Steam Navigation Company in 1826 bought the *Legislator*, a steamer of 107 tons burden, schooner rigged, and built in New York in 1824. Her engines were 60-horse power. She had two cabins for gentlemen and one for ladies, furnished in mahogany and cut maple. She ran two years, and when the Kennebec Steam Navigation Company closed up its business in 1828 she was sold south, and disappeared from New England waters. In 1829, Captain Seward Porter, with his brother Samuel, bought the *Connecticut*, of 350 tons burden, built in New York in 1816. She had masts, fore and aft sails, and a large square sail bent to a yard. Her engines were on the Fulton plan, with balance-wheel and couplings. Her cabins, large and roomy, were all below the main deck. It is said that this was the first boat in which Captain Mehemon Sanford, afterward a leading steamboat proprietor in these waters, was interested.

In 1832 Amos H. Cross, of Portland, chartered the *Victory* in New York, and in 1833 he substituted the *Chancellor Livingston*, "the masterpiece of Fulton." She was built in New York in 1816, and measured 494.78 tons. She was afterward lengthened, which greatly increased her tonnage, and her speed was also augmented by the rebuilding. Her engines were 56-inch cylinders and 6-foot stroke, and she was provided with three smokestacks, three masts, a bowsprit, and a jib-boom, with a square-sail on the foremast, and fore and aft sails. Her cabins and freight accommodations were on a much larger scale than those of any steamer heretofore navigating these waters.

In 1834 she passed into the hands of the Porters, who ran her in connection with the *Connecticut*. In 1835 the engines were taken out of the *Chancellor Livingston* and put into a new boat called the *Portland*, of 400 tons burden, with two stacks and one mast. It is said that this was the first steamer which burned anthracite coal successfully. She began her trips to Boston in 1835.

In 1833 the Boston and Bangor Steamship Company was formed. They built the steamer *Bangor* in New York, and placed her on the route between Bangor and Boston. She was of 400 tons burden and rigged with fore and aft sails, with square engines without a walking-beam. She burned wood, consuming about 25 cords each trip. The capital of this company was held mostly in Boston. The *Bangor* continued on this route until 1842, when she went to the Mediterranean. During 1835 Captain Seward Porter ran the *Sandusky* between Bangor and Boston, and in August of this year they put the *Independence* on the route, and fares were reduced from \$7 to \$5 per passenger.

The Eastern Steamship Mail Line was the name under which all the steamboats in Maine ran during 1836. The *Independence* was withdrawn from the Boston and Bangor route in September, leaving the *Bangor* on the route for the rest of the season, and for the following season, making three trips a week to Portland, where she made connections for Boston. In November, 1842, the Eastern railroad was opened to Portland, greatly diminishing the business of the Boston boats, and competition became very strong. Captain M. Sanford brought on the *Express* in this year and ran her between Portland and the Penobscot river. Finding Vanderbilt's competition too strong on Long Island sound, he brought on the *Charter Oak* in the following year and the

Admiral in 1844. Vanderbilt followed with the *Telegraph*, putting her on the Boston and Bangor route in 1842, continuing her through the season of 1843, and changing to the *Kennebec* in the following year. Competition at one time in 1842 was so strong that passengers were carried from Bangor to Boston for \$1 and from Portland to Boston for 50 cents.

In 1844 the Portland Steam Packet Company was organized, and the first steam propeller in these waters was built at Portland and named the *General Warren*. She was put upon the route between Boston and Portland. In the year following the company built another propeller called the *Commodore Preble*. As these boats had limited accommodations for passengers, it was found necessary to increase their facilities in this direction, and the side-wheel steamer *John Marshall* was purchased in New York and put upon the route with the propellers. Another side-wheel steamer, the *Saint Lawrence*, was built in New York, and two years later still another, the *Atlantic*, was added to the line, when the propellers and the *John Marshall* were withdrawn and sold. In 1854 the *Forest City* was built in New York, and in 1859 the *John Brooks* came out, running for a time to Bridgeport, Connecticut, but soon coming upon the route between Boston and Portland.

In 1845 Mr. Sanford transferred the *Penobscot* to the Boston and Bangor line. She left Boston on the night of June 17, by the "outside route", direct for Monhegan, the route having never been attempted before by a steamer sailing on "time and courses". From this time on this was known as the Sanford line. Captain Menemon Sanford, originator of the line, died in New York, June 24, 1852, at the age of sixty-three. In addition to the above line he owned a line between New York and Philadelphia, and was quite prominent as a steamboat owner in the early days. Outside of this traffic in Maine waters, Boston merchants were slow to adopt steam. Their fast clipper-ships conveyed their trade over the world. As late as the fall of 1844 they established a packet line to Liverpool that became famous during the following fifteen years, and it only succumbed when steamships ceased to be merely passenger carriers and the propellers came into general use, supplanting side-wheel steamers on transatlantic lines. From 1845 to 1860 sailing vessels had the preference on the great commercial routes of the world. Side-wheel steamers could not compete as freight carriers, and the propeller had not been perfected. The Cunard line selected Boston as its terminus in this country in 1840. Up to this time the trade of Boston with Liverpool had been transient, the packet lines centering in New York. In 1840 the building of the clipper-ships that became so famous as freight-carriers was begun. Previous to this date vessels of five hundred tons were considered large, but they soon ran up to 1,200, 1,700, and 2,000 tons as the demand for carriers increased. In 1852 the Boston and Philadelphia Steamship company was started, with two steamers on the line and an aggregate tonnage capacity of 1,000 tons. In 1852 the Merchants' and Miners' Transportation Company was chartered by the state of Maryland, and a part of the capital was taken in Boston. Two side-wheel steamers were built—the *Joseph Whitney* and the *William Jenkins*. The *Whitney* left Boston on her first trip December 28, 1854, arriving at Baltimore January 1, 1855. Two more steamers, the *S. R. Spaulding* and the *Benj. Deford*, were added in 1859, and the line extended to Savannah, but the breaking out of the war in April, 1861, suspended operations in this direction for a time. During the year 1864 the owners of the *Neptune* line, comprising the steamers *Neptune*, *Nereus*, *Glaucus*, *Metis*, *Thelis*, and *Doris*, which had been running between New York and Providence, contemplated sending steamers around to Boston, but as they were under charter to the government they could not do it then. Anticipating this, a few capitalists, among whom were Oakes Ames and General James S. Whitney, having three or four unemployed steamers on their hands, made arrangements to have them loaded for New York. The first steamer was the *Jersey Blue*, and then the *City of Bath*, the *Ceres*, the *Salvor*, the *Wyandotte*, the *Mary Sanford*, the *E. B. Hale*, and the *Miami* followed. In February, 1866, the line was chartered as the Metropolitan Steamship Company. Finding the field occupied, the *Neptune* line sold their steamers to this company.

In 1863 the Cunard line sent only semi-monthly steamers to Boston, the same as when they began in 1840. This was not satisfactory to those who were looking for a development of the export trade of the city, and a company was organized in July, 1864, under the name of the American Steamship Company, and some \$800,000 was subscribed. Many delays occurred, and it was not until October, 1865, that contracts were made for the construction of two wooden propellers of large size. In November, 1866, the *Ontario*, the pioneer of the line, was launched. The *Erie* followed the next spring. The *Ontario* made one trip to Liverpool in August, 1867, and was laid up, and the following year she and the *Erie*, which had never been to sea, were sold to New York. The misfortunes of this company had a discouraging effect upon the minds of the enterprising firms of Boston. An apathy succeeded, and when at last a revival of business came the Cunard line was on hand to secure the traffic.

The first towing in Boston harbor was done by ordinary steamers when not in service on their routes. When these could not be procured vessels were moved by means of buoys with lines attached placed off the ends of the wharves. The first service was by the little tow-boat *Danin*, the *Jno. Taylor* and the *Jacob Bell* entering the field later.

BUILDING IN THE NEW ENGLAND STATES.

The following table, compiled from the records in the office of the register of the treasury, shows the number and tonnage of steamers built in the New England states from 1817 to 1880, excepting the years 1818, 1819, 1820, 1822, 1831, and 1840, when none were recorded :

Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.
1817.....	1	80.52	1837.....	4	779.20	1853.....	12	2,960.37	1867.....	13	11,601.71
1821.....	1	98.33	1838.....	5	1,529.94	1854.....	12	2,580.36	1868.....	9	8,672.60
1823.....	1	135.08	1839.....	3	241.04	1855.....	20	7,784.78	1869.....	11	1,433.99
1824.....	2	294.55	1841.....	1	605.71	1856.....	11	2,701.38	1870.....	13	3,808.95
1825.....	5	520.16	1842.....	4	1,073.30	1857.....	8	2,339.53	1871.....	17	2,283.92
1826.....	1	65.23	1843.....	4	583.82	1858.....	8	2,021.76	1872.....	26	2,701.64
1827.....	3	453.19	1844.....	9	1,536.81	1859.....	7	2,172.30	1873.....	29	2,981.85
1828.....	1	215.15	1845.....	6	1,791.33	1860.....	14	5,488.44	1874.....	21	2,434.93
1829.....	2	113.02	1846.....	7	1,879.26	1861.....	14	3,800.38	1875.....	23	1,028.57
1830.....	1	37.60	1847.....	5	2,970.55	1862.....	13	7,957.41	1876.....	26	2,263.02
1831.....	2	450.92	1848.....	10	4,058.01	1863.....	21	10,350.85	1877.....	20	1,525.93
1833.....	1	261.70	1849.....	9	1,405.12	1864.....	31	10,942.96	1878.....	24	1,714.16
1834.....	2	306.12	1850.....	9	1,206.14	1865.....	41	22,008.03	1879.....	36	4,750.73
1835.....	5	1,301.58	1851.....	13	1,750.89	1866.....	29	15,239.67	1880.....	26	3,287.79
1836.....	3	1,250.61	1852.....	10	2,923.43						

GROUP II.—NORTHERN LAKES.

Previous to the war of 1812 quite a flourishing commerce was carried on upon Lake Ontario by sailing craft but it was not till 1816 that the side-wheel steamer Ontario was built at Sackett's Harbor, going into service in April of the following year. This was the first steamer on the American side, the Frontenac coming out at about the same time on the Canadian side. The Ontario measured 231.57 tons, and had beam engines, 34-inch cylinders, of 4-foot stroke. She was broken up in 1832. The second steamer, and the first built on the *upper lakes*, was the Walk-in-the-Water, which was launched at Black Rock, New York, in 1818. She was of 342 tons burden, and had low-pressure engines. She arrived at Detroit August 22, 1818, on her first trip, and afterward traded as far as Mackinaw, Michigan, and was finally wrecked on the night of November 1, 1818, at Buffalo, New York. The Sophia, of 49.70 tons, was also built at Sackett's Harbor in 1818, so that up to 1820 there had been built only 4 (*a*) steamers on the lakes as against 71, measuring 14,207.53 tons, on western rivers, and 52, measuring 10,564.43 tons, on the Atlantic coast, as stated. Within the next decade they had built 8 steamers on the lakes. The Superior, measuring 346.38 tons, came out at Buffalo in 1822; the Martha Ogden, of 48.63 tons, at Sackett's Harbor in the following year, and the Pioneer, measuring 124.67 tons, at Buffalo in 1825, followed in 1826 by the Niagara, of 156.92 tons, the Henry Clay, of 301 tons, and at Cleveland by the Enterprise, measuring 219 tons, the William Penn, at Erie, measuring 214.71 tons, and 1 small craft of 93.82 tons, making 1,505.13 for this decade.

BUILDING ON THE NORTHERN LAKES.

The following table, compiled from the records in the office of the register of the treasury, shows the number and tonnage of steamboats built on the northern lakes, 1816 to 1880, inclusive:

Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.
1816.....	1	231.57	1833.....	7	1,563.45	1849.....	19	* 11,140.30	1865.....	48	6,425.08
1817.....			1834.....	10	2,158.49	1850.....	8	† 3,351.01	1866.....	45	4,760.96
1818.....	3	690.27	1835.....	3	1,188.70	1851.....	9	5,347.04	1867.....	36	8,595.05
1819.....			1836.....	2	413.57	1852.....	19	8,600.94	1868.....	65	11,313.40
1820.....			1837.....	6	1,904.88	1853.....	20	13,330.38	1869.....	77	13,338.73
1821.....			1838.....	12	3,104.74	1854.....	31	16,565.13	1870.....	49	7,195.84
1822.....	1	346.38	1839.....	9	2,504.95	1855.....	21	† 23,109.53	1871.....	45	11,168.43
1823.....	1	48.63	1840.....	6	1,113.69	1856.....	26	§ 13,653.30	1872.....	60	15,925.91
1824.....			1841.....	3	813.90	1857.....	41	16,728.49	1873.....	104	21,179.12
1825.....	1	124.67	1842.....	5	1,397.68	1858.....	37	12,917.39	1874.....	99	24,487.20
1826.....	4	891.63	1843.....	3	532.42	1859.....	16	2,544.04	1875.....	70	12,480.65
1827.....			1844.....	6	1,476.24	1860.....	20	5,010.87	1876.....	79	8,972.30
1828.....			1845.....	5	2,241.75	1861.....	20	2,377.45	1877.....	39	3,801.95
1829.....			1846.....	15	5,861.61	1862.....	41	9,307.63	1878.....	55	8,643.65
1830.....	1	93.82	1847.....	19	7,659.49	1863.....	73	13,578.11	1879.....	44	11,542.48
1831.....	1	31.41	1848.....	13	7,373.39	1864.....	157	70,669.18	1880.....	65	14,306.30
1832.....	4	752.74									

\* 9 sailing vessels included.

† 3 sailing vessels included.

‡ 107 sailing vessels included.

§ 8 sailing vessels included.

*a* Including one steamer of 298.57 tons built on lake Champlain.

The growth of steam navigation on the lakes, it appears, had been retarded by the want of good harbors where the property could be protected from the gales that sweep these waters annually, doing much damage even at this date in spite of all the improvements that have been made for its protection.

In 1855 the steam inspection service reported the number of steamers on the northern lakes as follows: Licensed steamers, 128, measuring 68,089 tons, and unlicensed steamers, 115, measuring 21,252 tons. The next authentic statement of this tonnage was by the register of the treasury in 1870, when 642 steamers, measuring 142,973.09 tons, were reported.

#### PROPELLERS.

The first propeller built on the lakes was the *Vandalia*, a sloop-rigged craft of about 138 tons. She was launched at Oswego in 1841. She was followed by the *Oswego*, of 150 tons, in 1842. In 1843 there were seven propellers built at various points, as follows: The *Hercules*, 272 tons, at Buffalo; the *Samson*, 250 tons, at Perrysburg; the *Emigrant*, 275 tons, at Cleveland; the *Racine*, 150 tons, at Oswego; the *New York*, 150 tons, at Oswego; the *Chicago*, 150 tons, at Oswego; the *Independence*, 262 tons, at Chicago. In 1844 the *Porter*, of 310 tons, was built at Buffalo, and in 1845 the *Syracuse* came out at Oswego; the *Princeton* at Perrysburg, and the *Phoenix* at Cleveland. Up to 1850 there had been built on the lakes 50 propellers, measuring 16,427 tons. At the present day they have nearly supplanted the side-wheel steamer, excepting on routes where elegant passenger steamers are desired.

#### MEMORANDA.

The first steamer that arrived at Saginaw was the *Governor Marcy*, of 161 tons, commanded by Captain R. G. McKenzie. She went upon a regular route to that port about the year 1837, and was followed by the *Columbia*, of 167 tons, in 1850.

The steamer *Sheldon Thompson*, of 241 tons, built in 1829, made the first trip from Lake Erie to Chicago in 1832. She took up soldiers for the Black Hawk war.

The service of what is now known as "river tugs" was inaugurated in 1845 by the side-wheel steamer *Romeo*, of 180 tons. She was followed by the *Tecumseh*, the *Little Erie*, the *Telegraph No. 2*, and the propeller *Odd Fellow*, in 1848. This service is now performed by a class of powerful tugs, that are used to tow sailing vessels through Detroit river, and for wrecking purposes.

#### GROUPS III, IV, VI.—OHIO AND MISSISSIPPI RIVERS.

Previous to 1778 the Ohio river, it appears, was not navigated to any extent in the interests of commerce. Troops and war material of the French were moved from point to point on flat-boats, and colonists moving to Kentucky would float down to their destination from Fort Pitt (now Pittsburgh) on rafts or flats, as the case demanded. In the month of January, 1778, Captain Willing, acting as agent for the Continental army, took two large flat-boats loaded with produce to New Orleans, where he exchanged it for arms, ammunition, and stores, and he reached Fort Pitt on his return voyage, bringing up his goods and some fifty men besides. From this time on the traffic with the lower Mississippi was kept up, and Pittsburgh was soon known as an important trading post. Emigration began then to pour into the Ohio valley, and the navigation of the river increased rapidly. Besides the great variety of small craft and rude arks, numerous well built keel-boats, barges, and some sea-going vessels were soon used in conveying the products of this rich region down the Mississippi, where it found a market, and was exchanged for merchandise and West India products. It is stated that as late as 1817 the products of the Mississippi valley arrived in New Orleans in 1,500 barges and 500 flats, but no statistics of this commerce were kept at that early date.

In 1811 Fulton and Livingston began the construction of a steamboat at Pittsburgh. She was called the *Orleans*, and was completed that year, making her first voyage down the river and arriving at New Orleans January 10, 1812. It was found a difficult matter to stem the strong current of the lower river, and this was not practically accomplished for several years, or about 1814. Within the next ten years, however, there were built at Pittsburgh 30 steamers, measuring 5,698.78 tons; and from 1815, the date of the first steamer at Louisville, up to 1825, 35 steamers, measuring 6,032.26 tons, were launched at that port and vicinity. The first steamer built at Louisville was called the *Kentucky*, and she measured 112 tons, and, according to the record, she came out in 1815. The next was the *Governor Shelby*, of 106.25 tons burden, built in 1817.

From 1817 to 1827 there were built at Cincinnati 52 steamers measuring 9,306.61 tons. The *Vesta*, of 203.01 tons, came out in 1817, and was followed the next year by the *Eagle*, of 118.49 tons, the *Heckla*, of 124.25 tons, the *Henderson*, 123.17 tons, and the *Cincinnati*, of 157.38 tons. Besides these four steamers built at Cincinnati in 1818 there were four at Louisville, measuring 1,106.46 tons; five at Pittsburgh, measuring 1,226.48 tons, and one at Wheeling, of 140.31 tons. In 1819 there were twelve steamers built at Louisville, measuring 2,375.93 tons; six at Cincinnati, measuring 1,551.01 tons; two at Pittsburgh, measuring 501.71 tons; one at Wheeling of 224.51 tons,

and two at New Orleans, measuring 662.50 tons. The growth of steam navigation on the western rivers was remarkably rapid and exceeded that on the Atlantic coast by a large amount in tonnage, for we find that in 1820, according to these records, there had been built on the rivers 71 steamers, measuring 14,207.53 tons, as against 52 steamers on the Atlantic coast, exclusive of New England coast, measuring 10,564.43 tons. On July 27, 1820, a writer in a Louisville paper enumerated 73 steamers belonging to western navigation, and there were several on the stocks above the Falls of the Ohio and two at New Orleans. Estimating the freight actually carried by each boat at 150 tons, and on an average three trips to New Orleans annually, the up freight he placed at 33,300 tons, while down freight exceeded this figure. The up freight by flat-boats and arks would double this amount, so that 100,000 tons represented the upward movement. Freights ranged from 1½ to 2 cents per pound from New Orleans to Louisville, and the amount paid on this up freight by steamers was at that date \$1,332,000, taking the last named rate as the average. Down freights by steam were estimated at \$666,000. The passenger traffic both ways, calculating ten to a boat, at \$100 up and \$50 down, was placed at \$333,000, so that the total income from passengers and freight on steamers was estimated at \$2,331,000, to which was added \$500,000 for lower river traffic. Three years previous to this date it is stated there were only thirty steamers navigating the western waters. Great expectations were at this early date raised with regard to the commerce of New Orleans, since goods could be placed in any part of the Ohio valley for \$2.50 to \$3 per hundred pounds, while it cost nearly twice these sums to freight merchandise through from eastern seaboard cities. That New Orleans did not gain and hold the trade at that time was attributable to the superior capital and commercial character of the eastern merchants, and to the dangerous nature of river navigation at that early date.

From 1820 till the breaking out of the war, and up to 1865, when rail communication came in competition with the river interests, the progress of steam navigation on the lower river was rapid and extensive. The palmy days of steambating on the Mississippi were from 1840 to 1859, when the country had become populous and railroads had not yet come into active competition.

New Orleans was never an extensive building point. In 1817 the Harriet, of 54.46 tons, was built there, and she was followed the next year by the Louisiana, of 102.54 tons. In 1819, New Orleans is credited with building two steamers, measuring 662.50 tons, and in 1820 with six steamers, measuring 1,034.12 tons, in 1821 one steamer, of 46.53 tons, and in 1822, four small boats, measuring only 296.67 tons. Pittsburgh, Cincinnati, and Louisville were the leading building points, as they are to-day.

CONSTRUCTION ON THE WESTERN RIVERS.

The following table, compiled from the records in the office of the register of the treasury, shows the construction at the ports of Pittsburgh, Cincinnati, and Louisville, and on the western rivers from 1811 to 1880, inclusive:

PITTSBURGH.			CINCINNATI.			LOUISVILLE.			WESTERN RIVERS.		
Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.
Total .....	2,041	391,057.98	Total .....	1,374	322,094.26	Total .....	1,108	280,625.09	Total .....	5,898	1,227,685.27
1811.....	1	* 100.00	1811.....			1811.....			1811.....	1	* 100.00
1812.....			1812.....			1812.....			1812.....		
1813.....	1	25.00	1813.....			1813.....			1813.....	1	25.00
1814.....	2	385.67	1814.....			1814.....			1814.....	2	385.67
1815.....	4	965.71	1815.....			1815.....	1	112.00	1815.....	5	1,077.85
1816.....	1	131.80	1816.....			1816.....			1816.....	4	860.23
1817.....	2	338.80	1817.....	1	203.01	1817.....	1	106.25	1817.....	5	702.52
1818.....	5	1,226.48	1818.....	4	523.29	1818.....	4	1,106.46	1818.....	15	3,099.08
1819.....	2	501.71	1819.....	6	1,551.01	1819.....	12	2,375.93	1819.....	23	5,315.66
1820.....	3	298.75	1820.....	1	150.00	1820.....	6	1,309.65	1820.....	15	2,642.52
1821.....	1	263.59	1821.....	1	235.00	1821.....			1821.....	3	545.72
1822.....	1	120.90	1822.....	3	277.50	1822.....	2	204.04	1822.....	11	1,018.42
1823.....	5	715.76	1823.....	4	538.39	1823.....	4	375.17	1823.....	17	2,278.28
1824.....	6	1,135.28	1824.....	9	1,593.77	1824.....	5	442.76	1824.....	20	3,171.81
1825.....	3	364.67	1825.....	10	2,085.37	1825.....	5	615.75	1825.....	18	3,065.79
1826.....	12	2,649.09	1826.....	13	2,148.67	1826.....	10	1,766.00	1826.....	35	6,563.76
1827.....	12	2,072.58	1827.....	15	2,387.10	1827.....	6	784.93	1827.....	33	5,244.61
1828.....	11	1,541.42	1828.....	5	1,186.51	1828.....	2	250.34	1828.....	19	3,043.05
1829.....	18	3,577.36	1829.....	17	3,833.81	1829.....	1	150.36	1829.....	36	7,561.53
1830.....	15	1,984.17	1830.....	11	1,714.80	1830.....	7	1,162.18	1830.....	33	4,811.15
1831.....	15	2,055.91	1831.....	10	1,752.61	1831.....	2	195.23	1831.....	27	4,003.75
1832.....	41	6,073.17	1832.....	35	4,340.87	1832.....	9	1,498.20	1832.....	86	12,187.43
1833.....	24	3,193.00	1833.....	19	2,182.70	1833.....	8	921.47	1833.....	44	5,548.32
1834.....	30	4,220.10	1834.....	25	2,459.45	1834.....	9	1,327.62	1834.....	62	8,263.31
1835.....	32	3,384.14	1835.....	8	1,079.05	1835.....	8	1,546.90	1835.....	51	5,718.35

\* The tonnage of the steamer New Orleans in some cases is given at 371 tons.

## STEAM NAVIGATION IN THE UNITED STATES.

PITTSBURGH.			CINCINNATI.			LOUISVILLE.			WESTERN RIVERS.		
Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.
1836	68	8,386.41	1836	29	4,191.85	1836	9	1,714.00	1836	107	14,478.85
1837	66	10,736.40	1837	38	8,204.16	1837	8	1,389.90	1837	115	21,500.09
1838	43	7,424.63	1838	9	1,456.42	1838	7	1,332.88	1838	68	12,626.27
1839	46	5,387.86	1839	38	4,863.83	1839	11	2,101.50	1839	108	14,454.61
1840	21	2,407.18	1840	22	3,042.52	1840	5	1,090.53	1840	63	9,223.86
1841	34	4,983.41	1841	32	5,585.82	1841	19	4,416.77	1841	90	15,870.52
1842	42	4,235.40	1842	31	5,546.72	1842	22	5,607.67	1842	102	16,794.88
1843	17	2,817.44	1843	22	4,092.09	1843	11	1,664.18	1843	55	9,385.82
1844	34	6,138.53	1844	43	8,696.77	1844	35	7,165.11	1844	129	25,395.24
1845	46	6,504.81	1845	37	7,175.32	1845	26	5,681.01	1845	119	20,104.70
1846	49	7,506.89	1846	29	5,266.00	1846	46	8,061.47	1846	150	25,560.32
1847	57	9,516.45	1847	30	7,284.42	1847	30	5,340.65	1847	120	22,438.82
1848	42	7,287.43	1848	16	5,165.49	1848	39	9,274.60	1848	120	27,271.03
1849	52	7,946.01	1849	33	8,476.67	1849	34	8,423.33	1849	139	28,853.24
1850	50	8,405.73	1850	17	4,278.91	1850	34	6,460.69	1850	109	20,910.87
1851	51	7,601.52	1851	23	6,179.64	1851	38	8,861.49	1851	132	26,711.10
1852	55	12,317.81	1852	45	11,117.35	1852	27	7,312.77	1852	155	35,259.24
1853	34	7,112.11	1853	35	11,272.58	1853	30	8,592.09	1853	126	33,452.44
1854	61	11,833.43	1854	38	9,469.10	1854	22	6,823.71	1854	142	33,805.39
1855	51	10,059.35	1855	19	5,670.92	1855	27	9,402.77	1855	116	30,926.03
1856	60	12,329.57	1856	28	8,427.51	1856	18	5,042.22	1856	138	32,632.65
1857	70	12,929.35	1857	33	9,469.87	1857	28	8,462.46	1857	163	37,080.30
1858	53	9,541.13	1858	20	5,046.54	1858	28	8,302.74	1858	127	31,481.40
1859	29	4,199.21	1859	17	3,703.46	1859	19	3,702.47	1859	85	13,838.52
1860	69	10,811.01	1860	30	5,201.49	1860	29	8,631.78	1860	162	32,432.03
1861	47	9,558.25	1861	31	4,327.86	1861	33	9,717.29	1861	146	30,459.57
1862	25	3,174.40	1862	4	436.84	1862	3	1,042.32	1862	49	6,653.34
1863	57	12,025.72	1863	35	5,708.11	1863	22	5,920.31	1863	118	21,721.76
1864	36	17,194.03	1864	55	12,691.90	1864	15	5,530.05	1864	206	44,656.06
1865	66	15,845.06	1865	51	15,925.44	1865	30	6,924.76	1865	187	50,081.84
1866	63	15,921.70	1866	40	14,389.38	1866	21	7,470.23	1866	153	46,753.49
1867	27	9,511.39	1867	13	4,675.79	1867	20	6,834.28	1867	63	18,551.74
1868	20	4,728.33	1868	9	1,243.19	1868	21	7,582.63	1868	93	20,742.46
1869	18	5,843.88	1869	6	3,460.90	1869	10	3,267.54	1869	79	21,022.75
1870	26	9,881.95	1870	19	6,841.35	1870	28	12,138.90	1870	116	35,506.15
1871	37	13,844.11	1871	35	14,470.10	1871	27	11,586.02	1871	155	50,083.72
1872	20	7,131.55	1872	23	6,118.39	1872	21	7,711.54	1872	108	25,497.63
1873	9	1,749.53	1873	21	6,058.29	1873	17	3,302.03	1873	109	19,474.48
1874	23	4,810.15	1874	19	3,444.33	1874	17	4,380.01	1874	125	19,672.17
1875	5	1,603.61	1875	16	4,097.76	1875	20	2,436.70	1875	91	13,315.80
1876	3	829.24	1876	9	2,650.48	1876	19	3,947.92	1876	109	19,025.67
1877	13	2,977.62	1877	11	5,108.90	1877	20	6,267.40	1877	113	21,653.54
1878	23	8,935.60	1878	22	6,541.89	1878	25	6,471.76	1878	133	28,124.44
1879	16	5,967.70	1879	21	7,821.31	1879	17	10,081.26	1879	124	31,539.71
1880	10	4,329.74	1880	18	6,484.08	1880	18	5,302.11	1880	117	23,930.92

## UPPER MISSISSIPPI.

Saint Louis, the emporium of the upper Mississippi region, 848 miles from the falls of Saint Anthony and 182 miles above the mouth of the Ohio river, was selected by Laclède in 1764 as a point possessing peculiar advantages for the fur trade from the confluence of the different rivers in its neighborhood.

The statistics for sixteen years previous to 1805 show that the average annual value of the furs collected at this place amounted to \$303,750. The population at this date was estimated at 1,500, more than one-half of whom were absent a greater part of the year engaged in trapping. In 1810 the population was 1,600. In 1820 the census shows that the population had increased to 4,598; in 1830, to 5,852; and in 1840, to 16,469. The first steambot—the Antelope—arrived there in 1817, on her way to explore the great Missouri. In 1831 the Yellowstone ascended the Missouri to Fort Pierre. She was followed by the Assiniboine in 1833, and from this time on first-class steamers continued to navigate the turbulent Missouri, and Saint Louis grew in importance in connection with the fur trade and the river traffic.

TRAFFIC AT SAINT LOUIS.

A committee of eight citizens in 1845 prepared a report on the business of Saint Louis, from which it appears that during the year 1845 there were 2,050 steamboat arrivals in the harbor of Saint Louis, with an aggregate tonnage of 358,045 tons, and 346 keel- and flat-boats. The monthly list is as follows:

Arrived.	Steamboats.	Tons.	Flats, etc.
Total .....	2,050	358,045	346
January .....	65	13,431	16
February .....	67	11,167	17
March .....	215	40,985	51
April .....	207	38,396	11
May .....	300	50,024	27
June .....	218	30,271	9
July .....	192	36,066	5
August .....	201	35,556	37
September .....	182	30,570	32
October .....	174	27,498	45
November .....	214	32,252	96
December .....	15	2,829	.....

The trade of the city during that year was carried on by 213 steamboats, with an aggregate tonnage of 42,922, viz:

Boats.	Tons.	Boats.	Tons.	Boats.	Tons.	Boats.	Tons.	Boats.	Tons.
Amaranth .....	220	Confidence .....	139	Jasper .....	83	Nodaway .....	203	Rose of Sharon .....	48
Alps .....	112	Dove .....	150	J. M. White .....	498	New Haven .....	86	Robert Fulton .....	109
Alleghany .....	188	Die Vernon .....	212	Julia Chouteau .....	318	Nimrod .....	210	St. Louis Oak .....	109
Algonquin .....	226	Domain .....	132	James Ross .....	149	North America .....	248	Sarah Ann .....	162
Annawan .....	214	Denizen .....	326	James Madison .....	285	North Carolina .....	190	St. Louis .....	387
Alex. Scott .....	487	Dr. Franklin .....	281	Joan of Arc .....	337	North Bend .....	120	Superb .....	536
Ambassador .....	474	Defiance .....	135	Josephine .....	125	North Queen .....	108	St. Croix .....	159
Albatross .....	298	Dial .....	139	Little Ben Franklin .....	85	North Alabama .....	173	Sea-Bird .....	261
Atlas .....	135	Dr. Watson .....	141	Little Dove .....	76	Nathan Hale .....	135	Swiftsure, 3 .....	199
Archer .....	118	Eagle .....	26	Lancet .....	184	New Hampshire .....	125	Sam Seay .....	191
Amulet .....	56	Empress .....	306	Lasalle .....	109	Neptune .....	227	Sultana .....	527
Boreas .....	157	Eclipse .....	530	Lexington .....	157	National .....	198	Susquehanna .....	242
Brunswick .....	204	Express Mail .....	245	Little Pike .....	227	Nebraska .....	149	Swallow .....	160
Balloon .....	154	Empire .....	446	Levant .....	225	Omega .....	144	Star Spangled Banner .....	275
Bertrand .....	146	Falcon .....	142	Lebanon .....	141	Ohio .....	122	St. Landry .....	242
Bridgewater .....	67	Fortune .....	101	Lehigh .....	146	Osprey .....	128	Tobacco Plant .....	207
Brunette .....	207	Felix Grundy .....	166	Lynx .....	126	Ohio Belle .....	310	Time .....	119
Brazil .....	107	Frolic .....	126	L. F. Linn .....	162	Olive Branch .....	293	Tioga .....	170
Boreas No. 2 .....	222	Galena .....	135	Laclede .....	239	Oregon .....	182	Tuscaloosa .....	340
Blue Ridge .....	138	General Brooke .....	143	Louisiana .....	631	Orpheus .....	117	Tributary .....	149
Belle of Attakapas .....	247	General Warren .....	103	Luella .....	.....	Ohio Mail .....	118	Triumph .....	121
Big Hatchee .....	195	George Washington .....	303	Little Mail .....	82	Odd Fellow .....	96	Uncle Toby .....	110
Belle of Red River .....	246	Highlander .....	346	Lady Madison .....	148	Ocean Wave .....	205	Uncle Sam .....	432
Belle of Mississippi .....	305	Harry of the West .....	490	Lancaster .....	124	Pearl .....	42	Valley Forge .....	221
Batesville .....	178	Henry Bry .....	347	Lucy Long .....	82	Panama .....	97	Vesta .....	92
Banker Hill .....	271	Huntsville .....	138	Louisville .....	295	Plymouth .....	158	Warsaw .....	155
Belmont .....	115	Hannibal .....	464	Manhattan .....	242	Potosi .....	115	White Cloud .....	262
Brownsville .....	100	Hibernian .....	152	Missouri .....	689	Palestine .....	172	West Wind .....	208
Caspian .....	318	Herald .....	163	Maid of Iowa .....	60	Putnam .....	108	Wapello .....	248
Cambria .....	203	Harkaway .....	288	Mountaineer .....	213	Planet .....	121	Western Belle .....	137
ChAMPLAIN .....	428	H. Kenney .....	130	Mendota .....	157	Patriot .....	214	Walnut Hills .....	216
Congress .....	334	Helen .....	61	Monona .....	174	Pickaway .....	115	Wing and Wing .....	210
China .....	82	Independence .....	274	Mungo Park .....	95	Prairie Bird .....	213	War Eagle .....	155
Cecilia .....	128	Importer .....	199	Maria .....	692	Queen of the South .....	198	Wheel of Fortune .....	167
Clinton .....	268	Iola .....	84	Mermaid .....	158	Queen of the West .....	238	Wave .....	235
Cincinnati .....	374	Inda .....	360	Mary Tompkins .....	225	Red Rover .....	381	Wm. N. Mercer .....	97
Cutter .....	144	Iowa .....	109	Majestic .....	222	Radnor .....	163	Wiota .....	219
Columbia .....	150	Ione .....	170	Maid of Osage .....	64	Republic .....	148	Windsor .....	195
Charlotte .....	254	Iatan .....	173	Mail .....	411	Richmond .....	347	West Wood .....	250
Columbiana .....	124	Iowa (new) .....	249	Missouri Mail .....	209	Revenue Cutter .....	101	Western .....	117
Champion .....	320	Iron City .....	118	May Queen .....	92	Richard Clayton .....	108	Yucatan .....	141
Charmont .....	121	John Aull .....	240	Metamora .....	297	Revenue .....	146	Zanesville Packet .....	74
Cumberland Valley .....	168	John Golong .....	144	Mill Boy .....	63				

The foregoing statement embraces only steamboats, barges and keels being omitted. Of these, many were towed by steamboats, and a large amount of freight was transported by them.

## STEAM NAVIGATION IN THE UNITED STATES.

From the same report is compiled the following table of the places whence these vessels came, showing the arrivals from each quarter for each month, as follows:

	New Orleans.	Ohio river.	Illinois river.	Upper Mississippi.	Missouri.	Other points.
Total .....	250	406	298	643	249	204
January .....	17	5	15	15	5	8
February .....	18	13	20	12	2	7
March .....	27	42	57	67	11	11
April .....	24	39	36	75	23	10
May .....	35	49	52	102	49	13
June .....	27	33	29	66	42	21
July .....	16	46	26	58	29	17
August .....	20	44	26	63	25	23
September .....	25	38	7	60	22	30
October .....	22	45	13	48	20	26
November .....	21	47	17	74	20	35
December .....	3	5		3	1	3

From the foregoing it appears that during the year 1845 there were 250 steamboat arrivals at Saint Louis from New Orleans; 406 from different ports on the Ohio river, including arrivals from the Cumberland and Tennessee; 298 from ports on the Illinois river; 643 from ports on the Mississippi above the mouth of the Missouri, not including the daily trip of the Alton packet; 249 from ports on the Missouri river, and 204 from other ports, chiefly from Cairo and intermediate ports. At this date the tonnage on the rivers was reported as follows:

	Tons.
At Pittsburgh .....	9,233
At Wheeling .....	1,340
At Pearl River .....	378
At New Orleans .....	19,321
At Saint Louis .....	16,664
At Nashville .....	5,666
At Louisville .....	7,114
At Cincinnati .....	13,137
Total .....	<u>72,853</u>

## TRAFFIC AT SAINT PAUL.

The first steamboat that ascended the Upper Mississippi as far as Fort Snelling, near the falls of Saint Anthony, was the Virginia, a stern-wheel boat, which arrived at the fort in the early part of May, 1813.

From 1823 to 1844 there were but a few arrivals each year, sometimes not more than two or three. The steamers running on the Upper Mississippi at that time were used altogether to transport supplies for the Indian traders and the troops stationed at Fort Snelling. Previous to the arrival of the Virginia keel-boats were used for this purpose, and sixty days' time from Saint Louis to the fort was considered a good trip. In 1844 the country had become settled enough to warrant the introduction of a regular line, and the Otter was put upon the route from Saint Louis to Saint Paul. The next year the Lynx and the Argo followed, and in 1847 the Senator.

In 1851 three boats went up the Minnesota river, and in 1852 one ran regularly up that stream during the season. In 1853 the business required an average of one per day.

The following table shows the number of arrivals at Saint Paul from 1844 to 1856, including those from above and below, with date of opening and closing of the river:

Year.	Date of first arrival.	Number of arrivals.	River closed.
1844 .....	April 6 .....	41	November 23.
1845 .....	do .....	48	November 26.
1846 .....	March 31 .....	24	December 5.
1847 .....	April 7 .....	47	November 29.
1848 .....	do .....	63	December 4.
1849 .....	April 9 .....	35	December 7.
1850 .....	do .....	104	December 4.
1851 .....	April 4 .....	119	November 28.
1852 .....	April 16 .....	171	November 18.
1853 .....	April 11 .....	300	November 30.
1854 .....	April 8 .....	215	November 27.
1855 .....	April 18 .....	560	November 20.
1856 .....	do .....	846	November 10.

In 1856 the arrivals at Saint Paul were as follows:

From Saint Louis .....	212
From Fulton City .....	23
From Galena and Duluth .....	228
From Dubuque .....	134
From Minnesota .....	216
From Head of Lake Pepin .....	23
	<hr/>
Total .....	846
	<hr/> <hr/>
Number of boats .....	78
	<hr/> <hr/>

A thriving trade sprung up between the southern counties of Minnesota and Galena and Dubuque. During a portion of the summer the War Eagle and Tishomingo ran regularly to Winona. Above, on the Upper Mississippi, the three steamers, Governor Ramsey, H. M. Rice, and North Star, ran between Saint Anthony and Sauk Rapids.

#### GROUPS V, VIII.—MIDDLE AND SOUTH ATLANTIC STATES.

Having already given the early operations of Rumsey, Fitch, Evans, Fulton, and Stevens, in this region, it is not necessary to go into the details, in a short sketch of this nature, of the introduction of steam on all the waters of the Atlantic coast. Steamboat building was actively begun at various points.

At Philadelphia the first boat built was the Camden, of 53.30 burden, in 1812, already mentioned as one of Fulton's steamers. She was followed by the Philadelphia, of 214.26 tons, in the same year, and by the Bristol, of 101.53 tons, the Eagle, of 261.49 tons, and the Delaware, of 206.86 tons, in 1813.

At Philadelphia, in 1815, the *Ætna*, of 125.70 tons, was built, and then, in 1816, the *Baltimore*, of 201.42 tons, followed by the *Massachusetts*, of 97.75 tons, and the *Superior*, of 179.47 tons.

At Baltimore the first steamer constructed was the *Chesapeake*, of 183.23 tons, in 1813. The next steamer was the *Philadelphia*, of 240.85 tons, followed by the *Surprise*, of 92.35 tons, in 1816, and the *Virginia*, of 289.08 tons, and the *Experiment*, of 23.40 tons, in 1817, with the *United States*, of 309.39 tons, in 1818, and the *Maryland*, of 297 tons, in 1819. At Washington, District of Columbia, the *Union*, of 63.69 tons, was built in 1816, and at Savannah, Georgia, the first steamer recorded was the *Enterprise*, of 152.10 tons, in this same year, with no other steamer mentioned on the South Atlantic coast till 1820, when the *Cokmulger*, of 161.41 tons, was built at the port of Savannah. We have no record of building at Charleston till 1822, when the *Hamburgh*, of 285.36 tons, came out, followed, in 1823, by the *Columbia*, of 121.41 tons, and the *U. M. Lowndes*, of 220.88 tons.

The first steamboat built at Norfolk was the *Norfolk*, of 223.18 tons, in 1818, and the next the *Potomac*, of 264.36 tons, in 1820, followed by the *Hampton*, of 100.03 tons, in 1821.

In 1820 the steamers in service along the Atlantic coast were distributed on the routes as follows:

AT NEW YORK.—The *Connecticut* and *Fulton* on Long Island sound; between New York and New London and New Haven; changing in 1822 to Providence. The *Richmond*, *Chancellor Livingston*, *Paragon*, and *Car of Neptune* on the Hudson, from New York to Albany, and the *Fire Fly* to Newburgh. The *Olive Branch*, New York to New Brunswick. The *Swift*, from New York to Elizabeth. The *Franklin*, from New York to Shrewsbury. The *Atlanta*, from New York to Elizabethtown Point. The *Bellona*, from New Brunswick to Staten Island, and the *Nautilus*, from New York to Staten Island.

AT PHILADELPHIA.—The *Pennsylvania* and *Ætna* were running from Philadelphia to Bordentown. The *Philadelphia*, from Philadelphia to Trenton. The *William Penn* and *Bristol*, from Philadelphia to Bristol. The *Superior* and *Vesta*, from Philadelphia to Wilmington, and the *Baltimore* and *Delaware*, from Philadelphia to New Castle.

AT BALTIMORE.—The *United States* and *Philadelphia* were running from Baltimore to French Town. The *Virginia* and *Norfolk* to Norfolk; the *New Jersey* to Elkton; the *Maryland* to Easton, and the *Eagle* and *Surprise* were on no regular routes.

AT WASHINGTON.—The steamer *Washington* ran to Fredricksburg, and the new steamer *Potomac*, built at Norfolk, was put upon the route between these two ports.

AT NORFOLK.—The steamers *Roanoke* and *Richmond* ran between that port and Richmond. The *Powhatan*, *Petersburg*, and *Sea Horse* were also on routes from that port.

AT SAVANNAH.—The steamer *Enterprise*, of 152.10 tons burden, was running to Charleston and river ports in that vicinity.

#### THE FIRST STEAMER ON THE DELAWARE.

The experiments of Fitch on the Delaware in 1790, when his boat ran some two or three thousand miles during the season, and the success of Oliver Evans in 1804, have been mentioned. The first voyage of a steamer at sea, it will be remembered, was made by the *Phoenix*, when she was brought around into the Delaware from New York in

June, 1809. Robert L. Stevens, son of John Stevens, the inventor, started with a small crew on the Phoenix and in company with a schooner. A fierce storm overtook them, and the schooner was driven out to sea, while the steamer made a harbor at Barnegat. After the storm subsided Stevens succeeded in bringing her around to Philadelphia. She was put upon a route to Trenton on July 5, 1809. She was provided with masts, and had twenty-five commodious berths in her cabin and twelve in the steerage. The next steamer on the Delaware was the Camden, a ferry at Philadelphia, and the next the Philadelphia. The latter ran from Philadelphia to Bristol, where passengers took stages for New Brunswick, thence to New York by steamer. She was provided with a high-pressure engine, constructed by Oliver Evans, as were also those in the Delaware and Ætna. These, it is believed, were the first boats to adopt this style of engine. The Ætna exploded her boiler at New York in 1824. Nearly all of these first steamers were provided with copper boilers; that in the Fulton, on Long Island sound, is said to have cost \$32,000.

#### THE FIRST STEAMERS ON THE POTOMAC.

A correspondent of the *National Intelligencer*, writing from Norfolk under the date of May 24, 1815, gives the following relating to the steamer Washington, of 186.24 tons, built in New York in 1813, by Fulton: "We were last evening, for the first time, gratified with the sight of a steamboat entering our harbor. The distinguished stranger is called the Washington, commanded by Captain O'Neale, and owned by a company of gentlemen at Washington. We were in high hopes that she would ply between this place and Richmond, but understand she is destined for the Potomac. On leaving New York she made the trip in perfect safety in fifty hours." The Washington was 130 feet long by 32 feet beam, and cost about \$40,000. She made the run from Norfolk to Washington in thirty hours, arriving at the latter place on June 1, 1815. Captain Mix took command of her on June 6, and she went on a route to Acquia creek on June 8, and ran to Frèdericksburg on June 15. She was followed by the Potomac in 1820, which ran between Norfolk and Washington.

#### OCEAN STEAM NAVIGATION.

In May, 1819, the steamer Savannah arrived at Savannah from New York. She had been built as a sailing packet for the Liverpool trade. The rigging and other appurtenances for sailing were retained, and she was supplied with steam machinery and paddle-wheels. The latter were constructed to fold up and were taken off and laid upon the deck when not in use. She was the first steamer to cross the Atlantic, and left Savannah for Liverpool May 26, 1819. *Niles' New York Register*, of August 21, 1819, contains the following paragraph: "The steamship Savannah, Captain Moses Rogers, the first that ever crossed the Atlantic, arrived at Liverpool in twenty-five days from Savannah, all well, to the great astonishment of the people at that place. She worked her engine eighteen days." She sailed for St. Petersburg, Russia, on the 13th of August and returned to Savannah in November, 1819, after a passage of fifty-three days from St. Petersburg. She left Savannah for Washington on November 4 and lost her boats and anchor off Cape Hatteras. She changed hands at Washington, her engines were taken out, and after being used for a time as a sailing packet between New York and Savannah, she went ashore on Long Island and was broken up. The next ocean steamer built in this country was the Robert Fulton, of 702.30 tons, launched at New York in May, 1819, at the yard of Mr. Eckford. She was built to ply between New York, Charleston, Havana, and New Orleans. She left New York on her first trip on April 25, 1820, and reached Havana in seven days, and usually made the trip through to New Orleans in nine days. She continued on the route for three years, and as far as safety and speed were concerned she was successful; but she did not pay expenses and was sold to the Brazilian government, when her engine was removed, and she was converted into a cruiser. The Robert Fulton was the largest steamer that had been built in this country at that date. She was ship-rigged and plated with copper. Her engine, which was similar in construction to that in the Chancellor Livingston, and geared with cogs and a balance-wheel, was placed in a fire-proof apartment. Sailing packets monopolized the coasting trade for many years after this. The first regular ocean mail steamship was the Southerner, built in 1846, and put upon the route between New York and Charleston. She was followed by the Falcon, of 875 tons. In 1847 the Washington and Hermann were put on a route between New York and Bremen. In 1848 the Franklin, and in 1850 the Humboldt, were added to the line to Havre. The Collins Line sent out their first steamer, the Atlantic, on April 27, 1849.

STEAMSHIP LINES OF THE PORT OF NEW YORK, 1851.

	Tons.		Tons.
New York and Liverpool United States mail steamers, New York to Liverpool:		Pacific Mail—Continued:	
Atlantic .....	3,000	Carolina .....	600
Pacific .....	3,000	Columbus .....	600
Baltic .....	3,000	Isthmus .....	600
Arctic .....	3,000	Unicorn .....	600
Ocean Steam Navigation Company, comprises United States Mail Steamship Line, New York to Bremen:		Fremont .....	600
Washington .....	1,700	John L. Stephens .....	1,500
Hermann .....	1,700	Total .....	<u>14,736</u>
New York and Havre Steam Navigation Company, New York to Havre:		United States Mail Company:	
Franklin .....	2,200	Georgia .....	3,000
Humboldt .....	2,200	Ohio .....	3,000
Glasgow and New York Steamship Company, New York to Glasgow:		Illinois .....	2,500
Glasgow .....	1,962	Empire City .....	2,000
Coast Line, New York to Charleston:		Crescent City .....	1,500
Steamers—		Cherokee .....	1,300
Marion .....	1,200	Philadelphia .....	1,200
Union .....	1,500	El Dorado .....	1,300
Southerner .....	1,000	Falcon .....	1,000
Adger .....	1,500	George Law .....	2,800
Propellers—		Total .....	<u>19,600</u>
Benj. Franklin .....		Vanderbilt's Line, via Nicaragua:	
William Penn .....		Northern Light .....	2,500
Coast Line, New York, Charleston, Norfolk, and Richmond:		Prometheus .....	1,500
Propellers—		Pacific .....	1,200
City of Norfolk .....	444	S. S. Lewis .....	2,000
City of Richmond .....	518	Morning Star .....	2,500
New York and Alabama Steamship Company, New York, New Orleans, Mobile, and Havana:		Independence .....	900
Black Warrior .....	1,900	Pioneer .....	2,500
New York and Savannah Steamship Company, New York to Savannah:		Brother Jonathan .....	2,100
Florida .....	1,300	Star of the West .....	1,600
Alabama .....	1,350	Daniel Webster .....	1,200
Augusta .....	1,350	Total .....	<u>18,000</u>
New York and Virginia Steamship Company:		New York and San Francisco Steamship Company:	
Roanoke .....	1,050	Winfield Scott .....	2,100
Jamestown .....	1,050	United States .....	1,500
Pacific Mail:		Cortez .....	1,800
Golden Gate .....	2,500	Uncle Sam .....	2,000
Tennessee .....	1,300	Total .....	<u>7,400</u>
Republic .....	1,200	Empire City Line:	
Oregon .....	1,099	Sierra Nevada .....	1,800
Panama .....	1,087	City of Pittsburgh .....	2,000
California .....	1,050	San Francisco .....	3,000
Columbia .....	800	Total .....	<u>6,800</u>

Total number of steamship companies, 15, with 63 steamers, measuring 111,496 tons. (a)

# STEAM NAVIGATION IN THE UNITED STATES.

## BUILDING ON THE ATLANTIC COAST.

The following table, compiled from the records in the office of the register of the treasury, shows the growth of steam navigation and the construction in the two groups comprising the middle and south Atlantic states:

NEW YORK.			PHILADELPHIA.			BALTIMORE.			ATLANTIC COAST.		
Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.
Total .....	1,580	692,202.11	Total .....	755	239,641.70	Total .....	181	46,670.96	Total .....	3,304	1,156,173.84
1812.....	2	189.52	1812.....	2	267.56	1812.....			1812*.....	4	457.08
1813.....	2	513.49	1813.....	3	569.88	1813.....	1	183.23	1813.....	7	1,429.66
1814.....	1	370.93	1814.....			1814.....			1814.....	1	370.93
1815.....			1815.....	1	125.70	1815.....			1815.....	1	125.70
1816.....	4	1,220.30	1816.....	3	478.64	1816.....	2	333.20	1816.....	12	2,532.94
1817.....	1	25.33	1817.....			1817.....	2	312.48	1817.....	4	450.09
1818.....	2	226.52	1818.....	2	395.36	1818.....	1	309.39	1818.....	6	1,153.45
1819.....	2	1,129.01	1819.....	1	407.57	1819.....	1	297.00	1819.....	5	1,974.93
1820.....	2	171.88	1820.....	1	148.00	1820.....			1820.....	5	745.65
1821.....	2	373.22	1821.....	2	172.05	1821.....			1821.....	6	668.30
1822.....	1	207.85	1822.....			1822.....	2	369.10	1822.....	4	862.31
1823.....	2	294.63	1823.....			1823.....			1823.....	4	636.07
1824.....	6	924.61	1824.....	1	208.20	1824.....			1824.....	13	2,230.68
1825.....	11	2,388.87	1825.....			1825.....			1825.....	15	2,837.75
1826.....	17	3,520.54	1826.....	3	599.05	1826.....			1826.....	23	4,434.20
1827.....	6	1,614.01	1827.....	2	553.47	1827.....	2	255.88	1827.....	14	3,081.36
1828.....	10	2,143.21	1828.....	1	230.93	1828.....	2	404.10	1828.....	24	2,826.63
1829.....	7	1,450.10	1829.....			1829.....	3	1,259.82	1829.....	15	3,399.04
1830.....	5	652.72	1830.....	2	330.34	1830.....	3	875.05	1830.....	13	2,126.12
1831.....	4	663.64	1831.....			1831.....			1831.....	5	815.75
1832.....	4	1,084.15	1832.....			1832.....			1832.....	8	2,009.69
1833.....	5	1,444.61	1833.....	1	314.20	1833.....	4	1,148.04	1833.....	13	3,360.50
1834.....	7	1,135.40	1834.....			1834.....	1	324.26	1834.....	14	2,328.92
1835.....	2	288.14	1835.....	2	486.05	1835.....	2	771.26	1835.....	11	2,340.73
1836.....	16	3,911.71	1836.....	3	756.44	1836.....	1	226.40	1836.....	31	6,636.39
1837.....	16	5,109.30	1837.....	2	870.67	1837.....	4	1,793.72	1837.....	31	9,207.78
1838.....	7	1,737.59	1838.....	2	627.76	1838.....	4	2,329.17	1838.....	22	6,896.54
1839.....	16	3,695.56	1839.....	4	310.04	1839.....	5	1,213.56	1839.....	43	7,542.90
1840.....	8	2,647.49	1840.....	1	74.51	1840.....	1	413.65	1840.....	17	4,256.75
1841.....	8	5,023.61	1841.....	1	270.62	1841.....			1841.....	11	5,683.85
1842.....	18	4,533.44	1842.....	1	20.42	1842.....	1	69.85	1842.....	28	5,740.42
1843.....	5	1,819.28	1843.....	3	247.89	1843.....	1	394.30	1843.....	13	2,939.19
1844.....	14	3,079.54	1844.....	2	186.93	1844.....			1844.....	19	3,621.84
1845.....	17	6,578.37	1845.....	8	1,094.94	1845.....			1845.....	32	9,396.90
1846.....	23	8,249.59	1846.....	6	598.87	1846.....	3	829.65	1846.....	45	11,880.96
1847.....	15	8,767.63	1847.....	8	1,335.11	1847.....	1	462.52	1847.....	33	12,196.94
1848.....	10	9,088.31	1848.....	5	1,200.04	1848.....	1	231.62	1848.....	28	12,601.94
1849.....	21	11,018.08	1849.....	12	1,921.45	1849.....	5	2,324.00	1849.....	45	16,906.54
1850.....	29	19,278.08	1850.....	17	3,629.49	1850.....	4	1,159.32	1850.....	63	26,528.80
1851.....	47	33,494.74	1851.....	26	7,941.53	1851.....	4	360.33	1851.....	89	44,438.10
1852.....	43	27,487.15	1852.....	20	5,668.42	1852.....	7	3,316.06	1852.....	82	38,598.09
1853.....	58	28,600.57	1853.....	22	7,734.84	1853.....	1	63.41	1853.....	94	40,744.21
1854.....	49	25,050.00	1854.....	19	3,779.09	1854.....	4	1,872.40	1854.....	91	34,724.29
1855.....	44	19,192.10	1855.....	23	5,261.51	1855.....	4	2,535.62	1855.....	82	28,375.59
1856.....	20	11,775.64	1856.....	8	556.52	1856.....			1856.....	42	14,220.00
1857.....	27	12,270.75	1857.....	14	1,534.73	1857.....	2	1,079.34	1857.....	55	18,114.55
1858.....	27	12,399.14	1858.....	12	2,385.67	1858.....	2	154.72	1858.....	51	17,128.23
1859.....	20	8,159.47	1859.....	6	1,853.68	1859.....	2	699.19	1859.....	47	14,913.68
1860.....	27	13,910.60	1860.....	9	1,306.44	1860.....	2	2,338.65	1860.....	57	24,663.80
1861.....	40	18,519.64	1861.....	11	1,376.47	1861.....	1	194.00	1861.....	57	23,070.71
1862.....	53	23,361.16	1862.....	8	4,434.30	1862.....	4	699.38	1862.....	73	30,694.94
1863.....	84	35,331.43	1863.....	43	9,560.10	1863.....	4	1,329.76	1863.....	141	48,413.27
1864.....	121	60,933.89	1864.....	60	12,086.21	1864.....	10	2,712.00	1864.....	199	78,004.20
1865.....	71	53,084.32	1865.....	31	6,500.11	1865.....	10	934.00	1865.....	122	62,914.19
1866.....	39	25,594.66	1866.....	46	14,422.60	1866.....	4	2,247.55	1866.....	109	52,308.53

\* Previous to 1812 there had been built, according to historical records, 7 steamers approximating 1,324 tons.

NEW YORK.			PHILADELPHIA.			BALTIMORE.			ATLANTIC COAST.		
Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.
1867.....	36	27,525.31	1867.....	6	2,965.03	1867.....	1	50.90	1867.....	59	38,032.50
1868.....	17	14,806.01	1868.....	4	533.79	1868.....	3	65.81	1868.....	49	20,439.41
1869.....	31	18,600.23	1869.....	22	2,645.83	1869.....	1	27.31	1869.....	77	24,408.83
1870.....	28	13,684.75	1870.....	6	2,047.35	1870.....	3	153.88	1870.....	72	19,299.98
1871.....	21	9,630.50	1871.....	14	3,141.55	1871.....	3	449.95	1871.....	68	19,972.14
1872.....	30	7,414.28	1872.....	26	2,195.89	1872.....	7	1,479.85	1872.....	88	16,873.90
1873.....	66	18,193.42	1873.....	26	8,862.03	1873.....	6	950.15	1873.....	140	40,491.24
1874.....	60	25,711.81	1874.....	33	16,367.84	1874.....	12	1,484.54	1874.....	135	51,633.03
1875.....	38	5,463.71	1875.....	30	18,334.47	1875.....	2	56.43	1875.....	100	30,965.01
1876.....	23	5,353.19	1876.....	31	13,435.92	1876.....	3	1,321.70	1876.....	86	29,780.80
1877.....	20	6,408.20	1877.....	17	6,514.72	1877.....	2	140.69	1877.....	58	15,102.94
1878.....	30	5,851.50	1878.....	24	21,298.67	1878.....	6	437.14	1878.....	88	34,104.32
1879.....	33	3,082.21	1879.....	28	19,506.40	1879.....	7	1,003.69	1879.....	95	29,136.24
1880.....	40	3,831.63	1880.....	28	16,957.71	1880.....	7	221.94	1880.....	110	29,369.30

## GROUP X.—UPPER MISSOURI RIVER.

The first steamboat that navigated the Upper Missouri was built at Pittsburgh by the American Fur Company in the spring of 1831, and was called the *Yellowstone*. She was a staunch boat, with side wheels, and her cabin on the same deck with the boilers. Commanded by Captain Bennett, she made her first trip during the summer of 1831 to Fort Pierre, whence she returned to Saint Louis for the winter. During the summer of 1832 she made her second trip, reaching Fort Union, near the mouth of the *Yellowstone* river. The second boat was built by the American Fur Company, and called the *Assiniboine*. She made her first trip in 1833, ascending to Fort Union, a few miles above the mouth of the *Yellowstone* river, whence she returned safely to Saint Louis. On this trip of the *Assiniboine*, the celebrated Indian traveler, Catlin, was a passenger. This boat made another trip in 1834, and in 1835 ascended as far as the mouth of *Poplar* creek, some 60 miles above the mouth of the *Yellowstone*. She was caught by the fast-falling water and was obliged to winter there. The following spring she took on a very valuable cargo of furs and started for Saint Louis. When she had reached *Heart* river, near where Fort Lincoln is situated, she was burned with her entire cargo.

For the twelve or fifteen years following the American Fur Company did all of the steamboating that was done above *Kanesville* (now *Council Bluffs*), Iowa, making such improvements on their boats as experience suggested. Many efforts were made to ascend the *Missouri* higher than *Poplar* creek, but it seems none were successful. During the summer of 1850 the *El Paso* succeeded in reaching the mouth of *Milk* river, but during all this time *Fort Union* was really the head of navigation. The steamboats running further up the *Missouri* than *Kanesville* were owned and operated by and for the American Fur Company only. Western Iowa began settling up at about this date, preparing the way for general commerce. In 1856 several boats besides those owned by the Fur Company ran up as far as the then new settlement of *Sioux City*, loaded with supplies suited to the wants of the country. This trade grew rapidly; until the spring of 1857 boats ran from Saint Louis to *Sioux City* weekly. Above *Sioux City* there was little change; the Fur Company sent up each season from two to four boats as far as the mouth of the *Yellowstone* river. In 1859 they built a small boat called the *Chippewa*. She was the first stern-wheel boat that navigated the Upper *Missouri*, and was better adapted to this river than any of her predecessors. She was accompanied by the *Spread Eagle* as far as *Fort Union*, and from thence pressed forward alone, passing *Milk* river, the highest point reached by the *El Paso* in 1850, and reached *Fort MacKenzie* June 17, 1859. From this place, only a few miles below *Fort Benton*, she turned back. The *Chippewa* reached *Fort Benton* on her trip in 1860, being the first steamboat that ever reached the present head of navigation. About this time there was much interest exhibited in the *Montana* gold mines, which started an emigration in that direction. Boats were at once fitted out, loaded with provisions, tools, clothing, and such supplies as promised rich profits, and sent to *Fort Benton*. During the first years of the war, the government established a number of posts on the *Missouri* above *Fort Randall*. This also increased the demand for boats, so that in 1864 there were at one time a dozen boats above *Sioux City*. In 1868 the first railroad reached *Sioux City*. Before the railroad had its warehouses built, a company was formed which owned and operated the *North Alabama*, the *Fannie Barker*, the *Deer Lodge*, the *Huntsville*, the *Tennessee*, and other boats between *Sioux City* and *Fort Benton*. This line carried private, military, and Indian freight, and were quite successful. They operated in connection with the *Sioux City* and *Pacific* railroad.

In 1870 they sold their shore property to the *Peck* line, operating on the river at that time. The *Kountz* line had also four boats in the river, and the *Coulson* line was organized about this time. The *Fort Benton* Transportation Company was organized in 1875.

## GROUP IX.—PACIFIC COAST.

The steamship *California*, which left New York in October, 1848, arrived at San Francisco February 28, 1849, being the first of the line of mail steamers along the coast. General Persifer F. Smith, a passenger on her, went to take command of the Pacific division of the military department of the United States. On March 31, 1849, she was followed by the steamer *Oregon*, which arrived at that port with some 350 passengers. She had on board Colonel John W. Geary, who was appointed postmaster for San Francisco. In October, 1849, steam navigation of the bay and rivers at San Francisco was adopted. Just two years previous, however, on November 15, William A. Leidesdorff had attempted to run a very small steamer which came from Sitka, but she was sunk in February, 1848, and no further steps were taken to start a line till after the discovery of gold. The venturesome then sent out many small vessels from the states. The *Pioneer*, a little iron steamer brought in pieces from Boston, was put upon the Sacramento river in September, 1849, and, being the first steamer, deserved the title. On October 9, 1849, the *Mint* had a trial trip which proved satisfactory. She was intended to run between San Francisco and the towns on the upper waters of the Sacramento. On October 26 the *McKim* left San Francisco for Sacramento. Before this time, voyages across the bay and up the Sacramento and San Joaquin rivers were made in schooners and launches. These vessels were often a week or ten days in making a trip now made in half a day. These steamers started every alternate day from San Francisco, and the fares at first were \$30 cabin and \$20 deck. If berths were used, \$5 extra was charged; meals on board were \$2 each. The well-known steamer *Senator* was soon placed on the line, and the little *Mint* withdrawn for another route. The *Senator* has the reputation of having made more money than any boat ever built in the United States, and, at the above prices, it may well be believed that she merits it.

Owing to this profitable traffic, steamers sprang into existence on this river as by magic.

The following is a list of steam vessels engaged in the river trade in 1850 and their tonnage:

Name.	Tonnage.
<i>Senator</i> .....	755.00
<i>Gold Hunter</i> .....	435.00
<i>El Dorado</i> .....	153.00
<i>McKim</i> .....	326.75
<i>Hartford</i> .....	251.00
<i>Governor Dana</i> .....	67.00
<i>Sacramento</i> .....	33.50
<i>Yuba</i> .....	28.00
<i>Phoenix</i> .....	24.00
<i>Linda</i> .....	52.50
<i>New England</i> .....	21.00
<i>Lawrence</i> .....	36.50
<i>Star</i> .....	20.00
<i>Excel and Scon</i> .....	8.00
<i>Etna</i> .....	19.00
<i>Jack Hays</i> .....	42.00
Sixteen steamers, with a tonnage of .....	2,277.25
Total tonnage of barks, brigs, and schooners .....	5,577.50
Storeships .....	6,628.25
Total tonnage .....	14,483.00

It was evident, in the spring of 1850, that a lively competition would arise between the owners of the various steamers advertised for the Sacramento route, and in consequence the fare was reduced.

The trade of the upper rivers was opened early in the year by the *Linda* and *Lawrence*. The steamer *Phoenix* was purchased in the spring of 1850 by a company and fitted up for dredging gold from the bed of the *Yuba* river. In sixty days the stock of the company advanced 100 per cent., yet the scheme proved unsuccessful. The steamer *West Point* was advertised for public patronage on the river route. Early in the year 1850 a company was formed in San Francisco for the purpose of putting on another line of steamers on the Sacramento. The *Senator* was making tri-weekly trips at this time, with fare from San Francisco to Sacramento \$25, and from Sacramento down to San Francisco \$30. These prices tempted others to put boats on the river, and the *El Dorado* was run in opposition to the *Senator* and *McKim*. After making two trips, the *El Dorado* was grounded on the mud flats near *Benicia*, but was soon on the route again, having been but slightly damaged. Encouraged by the immense profits, the steamer *Hartford* was added, and tri-weekly trips were made by each. The same company (*Aspinwall Steam Transportation Company*) placed the Captain *Sutter* on the route to *Stockton*, and the Sacramento to *Pueblo de San José*. On February 25, 1850, the *Star* went to Sacramento, and was put on as an up-river steamer. In February, 1850, when near *Benicia*, the *Senator* and the *McKim* collided, but no lives were lost, and, after a short delay for repairs, were again making their regular trips. On the 22d of January the brig *Charlotte* arrived in

Sacramento—rates of fare between San Francisco and Sacramento being \$10 for steerage and \$20 for cabin. On the 8th of May of the same year the steamer Gold Hunter arrived in Sacramento. She was 175 feet in length and 26 feet beam, with ten spacious cabins and berths for 100 passengers. Making an excursion trip for her first, she was soon after put regularly upon the route between the two cities, with the fare at \$25, and freight \$2 per hundred. The success of inland navigation soon became well understood, and steamers for this trade were sent out from the Atlantic coast.

March 2, 1850, the Wilson G. Hunt left New York for California, but encountering a severe storm on the 9th was delayed at Bermuda for repairs. The Governor Dana arrived at Sacramento about April 15, having been brought from Old Town, Maine. Her engines were of ninety horse-power, and machinery from Bangor. The hull was 130 feet, including the wheel in the stern, and the width of beam was 18 feet. The P. B. Redding, a small propeller of ten horse-power, passed Sacramento at the same date on her way to the upper river. The steamer Linda was announced to run to Vernon, Fremont, Nacolaus, Plumas, Eliza, Yuba City, and Marysville, leaving on Mondays, Wednesdays, and Fridays. The Major Tompkins arrived at the levee at Sacramento for the first time May 20, 1850. The California, a stern-wheeler, made her first trip in July of the same year. The rivalry and opposition in the Sacramento river trade began in the year 1851, and has continued. The fare between San Francisco and Sacramento was reduced to \$1, and freight was carried at correspondingly low rates. The time for making the trip was shortened, and accommodations were multiplied. New steamers were built, and others were imported, and early in the year the bay and river presented to the eye many in-coming and out-going steamers. Ship-building comes to notice for the first time in the immediate vicinity of Sacramento, for on the 18th of September, 1851, the steamer Comanche was launched from the Yolo side of the river. The San Joaquin and St. Lawrence were brought into service on the river route during the early spring and summer. The New World, Wilson G. Hunt, Antelope, Confidence, J. Bragdon, and Urilda were all competing for honors and patronage. The Antelope, under command of John Van Pelt, was called the Independent Line. This vessel was brought around the Horn, has been in the inland waters for over twenty-nine years, and till recently was owned and run by the San Francisco and Northern Pacific Railroad Company.

The following list will show the steamers running to and from Sacramento in 1853 :

	Tonnage.	Value.		Tonnage.	Value.
Total .....	5,099.50	\$1,086,100	Express .....	104	\$10,000
Senator .....	755	175,000	Daniel Moore.....	63	18,000
New World.....	525	150,000	Marysville.....	52	18,000
Antelope .....	650	140,000	Kennebec.....	44	9,000
Confidence.....	377	100,000	G. Winter.....	73	4,000
Wilson G. Hunt.....	372	90,000	Captain Sutter.....	51	12,000
Thomas Hunt.....	413	70,000	Caleb Cope.....	60	13,000
J. Bragdon.....	273	50,000	Governor Dana.....	91	18,000
Comanche.....	147	40,000	Orient.....	47	10,000
Urilda.....	140	35,000	Jack Hays.....	42	5,000
Eudora.....	106	17,000	Gazelle.....	81	25,000
El Dorado.....	153	10,000	Fashion.....	87	7,000
Empire.....	149.50	20,000	H. T. Clay.....	154	40,000

The *State Journal*, in 1854, says it is informed "that all the steamships plying on the Sacramento, San Joaquin, American, Feather, and Yuba rivers, have joined fortunes, with a capital of \$2,000,000. Richard Cheeny is to be president, and Captain Lysle, of the Bragdon, agent at Sacramento. It is reported that the Navigation company have bought the little steamer Pearl, having paid the round sum of \$60,000". The same company bought the opposition steamer Marion, with the understanding that she would not run to or stop at Sacramento. But in a few days, to the dismay of the company, she came up, loaded with passengers and freight, and stopped at Washington, just opposite Sacramento city. The Enterprise, owned by the merchants of Marysville, was for the first time put on the route from San Francisco to Sacramento and Marysville in 1854. The Anna Abernethy, a new boat, was run in connection with the Enterprise. In the fall the Willamette was put on as an opposition boat, and fares and freights reduced. The Queen City, on her first trip, carried 919 passengers. The Surprise was put upon the route in April, 1855, and was run as a day boat.

A new company (the Transportation) put on the Martin White this year, towing a large barge, which was the first ever towed up by steamer, a business now largely and profitably followed.

The first appearance of the Defender, an opposition boat, caused considerable excitement, and competition was very strong.

The following steamers were owned and run by the California Steam Navigation Company in 1856: Confidence, Helen Hensley, Colusa, New World, Cleopatra, Sam Soule, Antelope, and Governor Dana.

The Young America made her first trip to Marysville this season, passing Sacramento. The Eclipse soon followed. The light-draught steamers Latona, Eureka, James Blair, and Marie, were all built expressly for the river trade, and proved successful.

The Ann McKim and Young America were running a lively opposition in 1857—fares were again down to 50 and 25 cents. The Peytona and Goodman Castle came before the public in this year (1857), and another opposition sprung up between the Princess and the Cornelia. The Victor cost \$25,000, and was intended for the route from Sacramento to Marysville. The first trip down was made August 13, 1859. In March, 1860, the opposition steamer Milton S. Latham made her first trip, and the Urilda was cut down and made into a barge in June of the same year.

During the latter part of the year 1859 and in the spring of 1860 a bar began to form in the Sacramento river across the mouth of the American. It extended down to the Yolo bridge and formed an increasing obstruction to up-river navigation. In 1860 the building of favorite steamers for this river seems to have taken a new stride. In the summer of the same year the popular steamer Chrysopolis was launched at San Francisco. She was built by the California Steam Navigation Company at a cost of \$200,000, and was the largest and finest boat built up to this time in the west. She had accommodations for one thousand passengers; was one thousand tons burden, and made her first trip from San Francisco to Sacramento city August 2, 1860, running on alternate days with the Antelope to and from San Francisco.

The Defiance, though refused a license for carrying passengers over the bay of San Francisco, made her first trip to Sacramento July 29, 1860, carrying seventy-five passengers. On reaching the mouth of the river, going down, the passengers were transferred to a barge and towed to San Francisco. At this time the California Steam Navigation Company met a new opposition every few days, but generally proved themselves equal to them all. The John T. Wright was fitted up December 1, 1860, as an opposition boat. The following year the Nevada appeared at Sacramento, and after running about a year exploded her boilers. December 29, 1861, the Rainbow, built on the hull of the J. A. McClelland, was put upon the waters at Sacramento. It is understood that some of these early companies nearly ruined themselves by buying off opposition lines. The owners of a New Orleans boat, which was sent around to San Francisco, were paid \$50,000 and expenses to take her back again.

The year 1864 was a memorable one on the Sacramento. The famous steamer Yosemite was put upon the route, making her first trip May 29, 1864. The next year she exploded. The Washoe, however, had preceded her on this route May 8, 1864. The Flora, a stern-wheel steamer drawing only 11 inches water, went on the river June 19, 1865. She was built by the Navigation company for the Marysville trade, and was the lightest-draught steamer on the river.

In March, 1866, the Capitol made her first trip, and the Yosemite, having been repaired, took the place of the Chrysopolis. The navigation of the river about this time became very difficult for large steamers of this class, and measures were taken to raise money at Sacramento to have the channel deepened. The steamers on the river at this date, with their actual carrying capacity, which is always in excess of official tonnage, were the Capitol, 1,625 tons; Chrysopolis, 1,086 tons; Yosemite, 1,032 tons; Banner, 175 tons; Defiance, 58 tons; Victor, 272 tons; Governor Dana, 299 tons; Lark, 217 tons; Gem, 235 tons; Flora, 225 tons; Defiance, 58 tons; Victor, 272 tons; Governor Dana, 299 tons; Lark, 217 tons; Gem, 235 tons; Flora, 225 tons; Defiance, 58 tons; Victor, 272 tons; Governor Dana, 299 tons; Commodore, 79 tons; Reform, 79 tons; Fannie Ann, 88 tons; Belle, 78; San Joaquin, 77 tons; Lark, Jr., 25 tons; Larkin, 24 tons; St. Thomas, Jr., 25 tons; Sligo, 72 tons; Arrow, 43 tons; Mary Emma, 47 tons; Pet, 35 tons; Salano, 146 tons; Alice, 74 tons; O. K., 35 tons; Pioneer, 137 tons; Rainbow, 80 tons. The Central Pacific road got control about this date.

The first steamer to Napa was the Jim Hayes, followed by the Josephine in 1851.

Previous to the discovery of gold the commerce on the Pacific coast was limited to the fur trade and a few transient vessels for hides and tallow. The Pacific Mail steamer California, which left New York on the 6th of October, 1848, was the first steamer to enter on the Pacific coast trade, where now are nearly 350 steamers. As the gold fever developed the California was followed by others in quick succession; among them were the steamers Panama, the Oregon, the Tennessee, the Golden Gate, the Columbia, the John L. Stephens, the Sonora, the Republic, the Northerner, the Fremont, the Tobago, the Saint Louis, and the Golden Age. The Pacific Mail Company gained a strong footing, though the maintenance of the line so far from the base of supplies was a difficult and expensive undertaking. To procure ordinary food and other necessaries for their operations, to say nothing of coal and repairs, was a costly task. This company was compelled to construct large workshops at Benicia. As no dry-dock was in existence at that date, they were obliged to beach their steamers for repairs.

The government dock at Mare island was not completed until 1854. The establishment of coal depots at Panama, San Francisco, and Astoria was extremely expensive, material and labor being very high. Coal, whether from England or from the United States, was sent around Cape Horn, and cost not less than \$20 per ton, and for a large part of the time the Pacific Mail Company had to pay \$30 per ton, and in one instance \$50 per ton was paid. The nine steamers they ran at that time consumed about 35,000 tons per annum, and this alone gave employment to a large number of crafts. Twelve dollars per ton was a low freight rate to California and Panama. Considering the cost of the coal and handling, the waste and insurance, it will be seen that it could not be delivered for much less than the figures given. It may be presumed that no other line was ever maintained at such an enormous expense. The company, however, performed this difficult service with great regularity, and it is claimed that they did not lose a trip, a passenger, or a mail-bag during the first eight years by reason of marine disasters. They made the 3,300 miles between San Francisco and Panama by a time-table of thirteen and a half days, including stoppages, an average speed of about 254 miles per day. They maintained this regularity by having a number of spare steamers.

They had a semi-monthly line from San Francisco to Oregon, and reached Monterey, San Luis, Santa Barbara, San Pedro, and San Diego by a branch line. They had a few disasters, but none of a fatal character in the Pacific. The Winfield Scott was lost in entering the harbor of Acapulco; the Tennessee in entering San Francisco in a dense fog. The San Francisco was lost off the Atlantic coast as she sailed with troops for the Pacific. The history of the Pacific Mail Company in these waters is substantially that of the other lines that sprung into existence on the Atlantic and Pacific side in consequence of the discovery of gold and the sudden influx of navigation into California, though they were more fortunate than some of their competitors.

The Nicaragua Transit Company was the most unfortunate. This company lost the North America, the Independence, the S. S. Lewis, the Pioneer, and the Yankee Blade.

The United States Mail Steamship Company, operating on the Atlantic coast and Gulf, had at one time six fine steamers, measuring 8,544 tons in all, and lost heavily. The Crescent City was wrecked on the Bahama banks in 1855, the Cherokee was burned, and the Central America foundered at sea.

The first steamer built on the Pacific coast, according to the records in the office of the register of the treasury, was a small boat of 59.59 tons, built at Sonora in 1850.

In 1853 there were two steamers, measuring 150.50 tons, built at Sacramento, and in 1854 five steamers were launched at San Francisco, measuring 399.18 tons. According to early records, however, the steam tonnage in existence on the Pacific coast at this early date was as follows:

	Tonnage.
1850 .....	91.07
1851 .....	4,945.41
1852 .....	5,421.41
1853 .....	6,547.32
1854 .....	15,421.21
1855 .....	14,279.13

PACIFIC COAST INSPECTION.

The records of the inspection service from this date show the growth of active tonnage at San Francisco and on the whole Pacific coast to better advantage, as many of the larger steamers were built on the Atlantic coast and were registered there. The following table, compiled from the records of the inspection service, shows the annual inspection of steamers at San Francisco and on the Pacific coast from 1855 to 1880, inclusive:

Year.	SAN FRANCISCO.		PACIFIC COAST.	
	No.	Tonnage.	No.	Tonnage.
1855.....	33	19,714	33	19,714
1857.....	35	18,239	35	18,239
1858.....	35	20,057	35	20,057
1859.....	31	18,170	31	18,170
1860.....	43	23,493	43	23,493
1862.....	50	27,654	75	30,477
1863.....	44	22,509	68	25,868
1864.....	43	28,853	70	32,508
1865.....	63	33,686	88	38,124
1866.....	73	42,738	99	46,812
1867.....	85	49,162	119	57,198
1868.....	87	64,254	107	69,645
1869.....	113	65,660	166	75,934
1870.....	101	53,625	164	63,156
1871.....	110	70,539	180	83,279
1872.....	101	71,996	173	83,925
1873.....	124	67,804	204	83,271
1874.....	136	79,830	217	95,643
1875.....	136	79,392	222	98,369
1876.....	152	74,433	249	91,957
1877.....	163	78,348	271	102,912
1878.....	165	83,664	288	112,327
1879.....	161	78,401	292	109,790
1880.....	161	78,599	288	107,729

INSPECTIONS AT SAN FRANCISCO.

The following list of steamers, taken from the records of the inspection service, shows the names, dates of construction, and tonnage of vessels inspected at San Francisco during the year ending September 1, 1860:

Name.	When built.	Where built.	Tonnage.	Name.	When built.	Where built.	Tonnage.
Antelope .....	1847	New York .....	395. 29	James Blair .....	1857	San Francisco .....	108. 14
Brother Jonathan .....	1851	do .....	1, 359. 52	Milton S. Latham .....	1860	do .....	166. 55
C. M. Weber .....	1851	San Francisco .....	144. 06	Northerner .....	1847	New York .....	1, 012. 93
Cleopatra .....	1853	do .....	80. 23	Oregon .....	1848	do .....	1, 099. 09
Columbia .....	1850	New York .....	777. 24	Pike .....	1853	San Francisco .....	109. 75
Chrysolis .....	1860	San Francisco .....	884. 00	Princess .....	1858	do .....	103. 11
Cotes .....	1850	New York .....	1, 117. 38	Petaluma .....	1857	do .....	274. 74
Clinton .....	1853	San Francisco .....	156. 86	Pacific .....	1850	New York .....	1, 003. 34
Cornelia .....	1855	New York .....	218. 40	Panama .....	1848	do .....	1, 087. 31
Dashaway .....	1859	San Francisco .....	125. 48	Paul Pry .....	1856	San Francisco .....	229. 30
Defiance .....	1860	Sacramento .....	44. 20	Queen City .....	1854	do .....	379. 10
Eureka .....				Rambler .....	1859	do .....	128. 43
Eclipse .....	1854	San Francisco .....	478. 00	Sam Soule .....	1856	do .....	87. 73
Golden Gate .....	1851	New York .....	2, 067. 00	Swan .....	1856	do .....	91. 49
Gem .....	1853	San Francisco .....	66. 04	Sonora .....	1853	New York .....	1, 616. 77
Governor Dana .....	1853	do .....	91. 41	Senator .....	1848	do .....	754. 87
Goodman Castle .....	1857	do .....	71. 40	Sophie McLane .....	1859	San Francisco .....	242. 71
Gazelle .....	1852	do .....	81. 31	Uncle Sam .....	1853	New York .....	1, 433. 44
Golden Age .....	1853	New York .....	2, 281. 70	Visalia .....	1860	San Francisco .....	76. 78
Helen Hensley .....	1853	San Francisco .....	254. 42	Victor .....	1859	Sacramento .....	127. 84
John L. Stephens .....	1852	New York .....	2, 182. 47	Young America .....	1856	San Francisco .....	179. 41
J. Bragdon .....	1852	San Francisco .....	230. 00				

CONSTRUCTION ON THE PACIFIC COAST.

The following table, compiled from the records in the office of the register of the treasury, shows the steamers built on the Pacific coast, 1850 to 1880, inclusive:

Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.	Year.	No.	Tonnage.
1850 .....	1	59. 50	1860 .....	8	2, 023. 18	1868 .....	10	2, 270. 68	1875 .....	28	3, 950. 99
1853 .....	2	150. 57	1861 .....	7	¶4, 626. 74	1869 .....	28	3, 995. 00	1876 .....	31	8, 968. 47
1854 .....	5	399. 18	1862 .....	4	315. 67	1870 .....	33	4, 326. 20	1877 .....	24	4, 894. 75
1855 .....	4	*2, 117. 91	1863 .....	6	**2, 670. 67	1871 .....	13	3, 860. 87	1878 .....	22	8, 360. 53
1856 .....	1	35. 57	1864 .....	11	†4, 659. 96	1872 .....	8	1, 105. 71	1879 .....	29	8, 772. 23
1857 .....	3	†950. 01	1865 .....	9	2, 766. 22	1873 .....	12	3, 041. 40	1880 .....	25	7, 642. 61
1858 .....	6	‡2, 109. 47	1866 .....	15	3, 313. 08	1874 .....	16	3, 042. 72			
1859 .....	8	§2, 055. 91	1867 .....	8	1, 153. 73						

\*Includes 25 sail.  
†Includes 8 sail.

‡Includes 11 sail.  
§Includes 16 sail.

|| Includes 22 sail.  
¶ Includes 41 sail.

\*\* Includes 26 sail.  
†† Includes 35 sail.

STEAM ON THE COLORADO RIVER.

Soon after the permanent reoccupation of a fort at Yuma boats were sailed rather than towed up the river from the mouth to the fort. Then one or two little side-wheel steamers were built on the river, from which grew the Colorado Steam Navigation Company.

The Uncle Sam, owned and commanded by Captain Turnbull, was the first steamer to make the trip from the Gulf of California to Yuma landing. She arrived there December 3, 1852. By this steamer the fort was supplied until June 24, 1853, when she ran ashore a few miles below the fort and was abandoned. The first trip occupied fourteen days, being much impeded by an earthquake, which changed the channel of the river. She returned in fifteen hours and made the next trip in three days.

On June 18, 1854, Captain George A. Johnson, of the Colorado Steam Navigation Company, reached Yuma with a 60-ton side-wheel steamer, named General Jesup, after the quartermaster-general of the United States army, since which time the river has been regularly navigated by steamers; but, until 1872, freight for Arizona was shipped from San Francisco in brigs and schooners at irregular intervals, and at the mouth of the river transferred to barges which were towed up to Yuma by stern-wheel steamers.

In 1872 a regular line of ocean steamers was established by the Colorado Steam Navigation Company through from San Francisco to Yuma via the Gulf of California. This line continued until the Southern Pacific railroad reached the river, in the spring of 1877. The General Jesup was the first steamer to ascend the river above Yuma,

June 2, 1858, reaching a point 20 miles above the present site of Hardyville. On her return trip she met the Explorer, a little stern-wheel boat used by Lieutenant Ives in his exploration of the river. At this time no white man lived above Yuma, and fuel was gathered as they went along, the Indians showing no signs of hostility. The original Colorado was the only other steamer plying between Yuma and the mouth of the river. On her way down the Jesup ran on a stone just above Chimney peak, but she was afterward rescued by the Colorado. Barges were not used till Captain Truworth came on the river with the Esmeralda, and since that time freight has been seldom carried in any other way.

## HISTORY OF STEAM NAVIGATION IN OREGON.

Oregon boasts of a water route second only to the Mississippi in commercial importance. The Columbia river, forming the northern boundary of the state, is navigable for 300 miles from its mouth, excepting the two portages of 6 and 15 miles at the Cascades and the Dalles, respectively, around which railroads have been constructed. Ocean vessels ascend 115 miles above its mouth. Its largest tributary is the Willamette, which flows north 155 miles, connecting with the Columbia 110 miles from the sea. The Willamette is navigated by light steamers 126 miles above Portland. Navigation was formerly obstructed by the falls at Oregon City, but this difficulty was overcome by a canal of three-quarters of a mile in length, built in 1873, at a cost of \$600,000.

The Willamette is formed by the junction, near Eugene City, of three streams known as the Coast, Middle, and McKenzie forks. East of the Cascade mountains the Columbia receives the Des Chutes river, John Day's river, the Umatilla, Walla Walla, and Snake rivers. The latter is navigable above the mouth of the Powder river. The principal streams that flow into the Pacific from this state are the Rogue and the Umpqua rivers, each about 200 miles long, which rise in the Cascade mountains and flow west, breaking through the coast range. The Umpqua is navigable by steamers of light draught to Roseburg, 90 miles above its mouth, though more than half this distance is obstructed by rapids. Numerous other streams rise in the coast mountains and flow west to the Pacific, among which are the Nehelem, the Tillamook, the Coos, and the Coquille.

The headwaters of the Klamath river, which empties into the Pacific in California, are in the southwest corner of eastern Oregon, just east of the Cascade mountains. These, however, are not navigable to any great extent.

## THE LOWER WILLAMETTE AND THE COLUMBIA RIVERS.

The first steamboat built in Oregon territory was a small craft called the Columbia. She was launched at Upper Astoria in July, 1850, and was 90 feet long and of about 75 tons burden. It is said that all the hands at work upon her received from \$8 to \$10 per day. She soon wore out, and her engines were removed to another boat. The next steamer, a boat of fair proportions, was launched on the Willamette river in December, 1850, and was named the Lot Whitcomb, after the founder of the town of Milwaukee, which for a time was the rival of Portland. In order to bring business there, the property holders built the boat to run to Astoria, and make Milwaukee her home port. The fare charged between the two terminal points, Oregon City and Astoria, was \$25. She had a good model but was deficient in power, having only a single engine with a 17-inch cylinder, 7-foot stroke. She was afterward sold and went to Sacramento, where she ran as a freight boat for some time under the name of Ann Abernethy. Several small propellers were shipped in 1851 from New York in sailing vessels, and put together here. Among them were the Black Hawk and Washington. They were not, however, adapted to the navigation of either the Columbia or the Willamette river. The Belle and the Eagle were two small iron boats; the former a side-wheeler and the latter a propeller. They ran from 1853 to 1862 in the Oregon City trade, and were quite successful. In 1854 a small steamer called the Portland was built to run to Oregon City. She was subsequently taken above the falls and lost near Canemah, with 2 of her crew, going over the falls at Oregon City basin.

Captain J. C. Ainsworth, who had run on the Upper Mississippi as a pilot and knew the value of stern-wheelers for swift and crooked rivers, built the steamer Jennie Clark in 1856, with the aid of several capitalists. She was quite successful, and ran till 1863, when her machinery was taken out and put in the "49".

The Multnomah, originally built for the Willamette, did not pay, and was taken around the falls to run on the lower river. She was a side-wheel boat, about 100 feet long, and the first steamer that ascended the stream as far as Corvallis. These steamers were followed by others in quick succession, the Express in 1856, and the Carrie Ladd at about the same time. The Cascades, one of the largest and fastest boats on the Columbia river, built at Port Madison, on Puget sound, and the Julia, built at the same place, were boats that did good service. The former was abandoned in 1870 and the latter in 1873.

The John H. Couch was a Portland-built boat of this period. The Eliza Anderson, long and well known in the Puget Sound waters, was built in 1858, and was one of the most successful boats in this region. The E. D. Baker, the Wilson G. Hunt, and the New World—the two last named were brought around Cape Horn—all did good service on the Cascades route and in Puget sound. The Rescue and the Wenat were two paying steamers employed on the Cowlitz river up to 1873. The Fannie Troup, built at Vancouver's in 1868, and the Annie Stewart complete the list of important boats on the lower rivers.

## UPPER WILLAMETTE RIVER.

It appears that the steamer *Hoosier*, built below these falls, was the first boat to make a business trip above Oregon City, though she ran chiefly in the Yam Hill trade. She was about 52 feet in length, and continued on the river till the growth of the trade required more boats, when the *James Clinton*, the *Union*, and the *Elk* were added to the fleet. The fourth boat was the *Canemah*, 120 feet long, with side-wheels, and engines of 10-inch cylinders, 4-foot stroke. Her boilers exploded on August 8, 1853, killing one passenger. The *Oregon* and the *Shoalwater*, later, were not successful in navigating this swift river. Most of these early boats were deficient in their models and drew too much water. These boats were followed by the *Gazelle*, built in 1853. She began running in March, 1854, and on the 8th of April, while she was lying alongside the wharf at *Canemah* with about 50 passengers on board, the boiler exploded, killing eight and wounding a dozen others.

The *Wallamet*, a regular Mississippi river boat in construction, was a failure on this river, and was taken around the portage and towed to the Sacramento river.

The *Enterprise* and the *Onward* were two very successful steamers. The latter, built about 1858, was provided with a flued boiler similar to those used in locomotives.

The People's Transportation Company was formed in 1860 and held control of this river trade until 1871. They had the *Rival* and the *Senator* below the falls, and the *Active* and the *Alert* on the upper river. They built the steamers *Dayton*, the *Reliance*, the *Echo*, the *E. D. Baker*, the *Iris*, the *Albany*, the *Shoo Fly*, the *Fannie Pallon*, and the *Alice*. It is said that this company, when the locks were built, refused to use them, preferring to reship at Oregon City. This led to the formation of a new company, called the *Willamette Lock and Transportation Company*. They began operations in 1873, and a lively competition followed. The People's Transportation Company was finally obliged to sell out, and the *Oregon Steam Navigation Company* became the purchasers. The *Willamette Lock and Transportation Company* bought the *Annie Stewart*, and built the *Beaver*, the *Governor Grover*, and the *Willamette Chief*. This last-named boat, it is said, could run from *Corvallis* to *Astoria*, if necessary. Competition was strong between the *Chief* and the *Emma Hayward*, on the *Astoria* route, and passengers were carried between that place and *Portland* for 50 cents. A compromise was finally effected and the rival corporations were consolidated, the *Oregon Steam Navigation Company* absorbing its competitor. This company built the light-draft boats *Orient*, *Occident*, and *Bonanza*, in 1871. One of the best paying little boats, called the *Ohio*, was built about this time, and in 1874 it is said she ran all the way to *Eugene City* with 48 tons of freight, when previous to this no other boat could get above *Corvallis*. She made the money that built the *Salem*, another light-draught boat, which for some reason proved unsuccessful. The grangers of this region subscribed money to build the steamers *McMinnville*, the *A. A. McCully*, the *S. T. Church*, and others, and the business was overdone, as the railroad had cut off the passenger travel, and freights were down to the lowest possible figures.

## THE MIDDLE COLUMBIA.

This portion of the river is the section lying between the two portages. The *Cascades Portage* railroad is about six miles in length and is located in *Skamania* county, *Washington* territory. The portage of the *Dalles* is  $14\frac{3}{4}$  miles in length and situated in *Wasco* county, *Oregon*. The river lying between these portages is the deepest and easiest to navigate of any part of the entire river, being free from rocks and shoals. Its banks are precipitous palisades of basaltic rock. Navigation on this section of the river was begun in 1852, when the small iron propeller *James P. Flint*, which was built in the east, was hauled up over the *Cascades* and put upon a route to the *Dalles*, where a military post had been established. She was found too small for the increasing traffic, and another small side-wheel boat called the *Mary* was built. Freight at this date was \$20 per ton from *Portland* to the *Dalles*. The *Hassalo*, constructed in 1857, with the ill-fated *Gazelle's* engines for motive power, was very successful. The *Adventurer*, afterward called the *Umatilla*, was launched in 1857. She was a stern-wheeler, and was carried over the *Cascades* on her trial trip, as she had not steam enough on to stem the powerful current. She was uninjured, however, and was taken to *Victoria* and sold to run on the *Frazer* river, where she was very successful. The *Idaho*, about 165 feet long, and provided with 16-inch cylinders, 5-foot stroke, built in 1862, was a very successful boat, earning the money that built the *Oneonta* and the *Daisy Ainsworth*.

The People's Transportation Company put the *Iris* on the middle river about this time, and the *Wasco* and the *Teaser*, built at the *Dalles* in 1864, were followed by the *Oneonta*, a regular Mississippi river steamboat. Not proving secure she was rebuilt in 1869 and taken over the *Cascades* in 1870. This was a dangerous undertaking, for she was a side-wheel boat and liable to catch a current in one or the other wheel and "broach". It is told of *Captain Ainsworth*, then president of the *Oregon Steam Navigation Company*, that he took three of the best pilots in the employ of the company on board the boat as guests. He then went into the pilot-house and locked the door; then said grace, and backed the boat out into the current. The next moment she was booming through the yeasty torrent, dashing past bowlders, and flying like a bird. The big eddy below the block-house caught her and set her back upon a rock, but it inflicted no great damage, and she reached *Portland* in safety. The captain afterward said that, as president of the company, he took the responsibility, for if any serious accident happened, he alone would be to blame and the reputation of his pilots would not be damaged.

The Oneonta ran from Portland to the Cascades till 1877, when her hull was converted into a barge. Her descent of the Cascades was followed by that of the Nez Percé Chief in 1871 and the Shoshone in 1873, leaving the Idaho alone on the middle river. The Oregon Steam Navigation Company, however, soon built the Daisy Ainsworth. She had a short career. In November, 1876, she was bringing a load of cattle from the Dalles to the Cascades; the night was dark and stormy, and the watchman had neglected to place a light for her at the Cascades docks. The pilot mistook another light farther down the river and steered for that. Deeming himself near enough, he blew his whistle, when, to his surprise, a light appeared on his starboard-quarter. He had passed his point to round-to. She struck a rock and broke in two. No lives were lost, but the boat was a total wreck, her hull going over the Cascades. The Mountain Queen, of 718.63 tons, was built at the Dalles in 1877, during the winter following the loss of the Daisy Ainsworth, and contained her machinery, lacking only in boiler capacity. The Queen was fully up to the requirements of the trade. She could carry 200 tons of grain, which was then considered a good cargo. The same year that the Queen came out the little propeller Elvira was built for the jobbing trade from the Dalles along the river to the Cascades saw-mills. One of the largest stern-wheel steamers in this region was the Robert R. Thompson, measuring 1,158.04 tons, and launched at the Dalles in June, 1878. She was of the same model as the Wide West, built at Portland in 1877, though, not having as large upper works, she did not measure quite as much as the West

## UPPER COLUMBIA AND SNAKE RIVERS.

The Umatilla, the keel of which was laid under the name of Adventurer in 1857, was designed for the upper river, but, after her unexpected trip over the Cascades, nothing was done in the navigation of this portion of the river till the discovery of gold on John Day's river and at Florence drew a large number of miners to that region from northern California. This necessitated transportation facilities, and Messrs. Coe and Thompson built at Des Chutes the pioneer stern-wheel steamer and named her after the great Indian fighter, Col. George Wright, who was lost on the old and worthless Brother Jonathan. She made much money, and in 1865, after five years of excellent service, she was sent on an exploring excursion above Lewiston, on the Snake river, as far as she could go. She went up 96 miles and returned, the captain reporting the explorations of no practical value. The Wright was shortly afterward broken up, and her engines sent to Pend d'Oreille lake and put in the steamer Missoula. Proving unprofitable there, the machinery was transferred to the Toledo, on Cowlitz river.

The Okanagon, of 179 tons, was built in 1861 at the mouth of the Des Chutes. She was of inferior model and very slow, but a profitable boat. At this time the rate was \$40 per ton to Wallula and \$90 per ton to Lewiston. After about six years of service on the upper river the Okanagon was taken through the Dalles and over the Cascades. The Tenino, of 190 tons, was built about the same time at Des Chutes. She proved to be a very fast boat. Her engines were built at Wilmington, Delaware. In 1867 she was rebuilt, and in 1876 she sunk at Squally Hook. Her hull being worthless, the engines were taken out and put into another hull built at Celilo. The name being deemed a lucky one, this boat was called the New Tenino.

The Cassadilla was a small stern-wheel boat built at Columbus in 1862. She ran between Celilo and Wallula, and in 1866 was taken to Lewiston and ran between that place and Fort Lapwai, on the Clearwater, also making occasional trips to the mouth of the Assotin, on Snake river. After running for a short time on a route from Wallula to Priest Rapids and White Bluff, she was sold to the Oregon Steam Navigation Company, who put her engines in the steamer Cabinet, on Clark's Fork, above Pend d'Oreille lake. About this time the small steamer Lewiston, built for Snake river, was launched, but after running for two seasons to poor business, she was dismantled and her engines placed in the steamer Ann, and from her they went into the Calliope.

The steamer Spray, of 128 tons, was built in 1862 as an opposition boat to the Oregon Steam Navigation Company's boats. She subsequently fell into the hands of this corporation, who finally transferred her engines to the Orient, on Yam Hill route. Nearly all these early boats were deficient in power. The Webfoot, of 200 tons, built in 1863, was of poor model. She was 160 feet long with 28 feet beam, and had a pair of 17-inch cylinders of 7-foot stroke of piston. This boat used a great deal of fuel and proved unprofitable.

The Nez Percé Chief, of 146 tons, built in 1863, proved a fast boat with limited carrying capacity. The traffic, however, was very different then from what it is now. There was no grain from the Snake river regions nor from the rich valleys of the Walla Walla and the Touchet; hence capacity was of little consequence so long as quick time was made.

The Chief ran till she was well worn out, when she was brought over the Tumwater falls, through the Dalles, and over the Cascades to Portland, where her engines were taken out and put into the Occident, in the upper Willamette trade. The Yakima and the Owyhee were begun in 1864 at Celilo, but before they were finished they passed into the hands of the Oregon Steam Navigation Company, and they were run to Lewiston from that time till 1876, each of them having been sunk several times, but raised and run till well worn out.

The engines of the Yakima went into the Annie Faxon. The Owyhee was sunk at the small rapids at the foot of the "big bend", and from this circumstance they are now known as Owyhee rapids. Her engines went into the Welcome. The Shoshone, of 299.73 tons, was built for the Idaho trade when it was at its height, in 1866. Parties who had traveled along the Snake river above the Bois  reported it navigable for a distance of 200 miles,

and, desiring to be first in the trade, the Oregon Steam Navigation Company commenced building this boat at Ords' Ferry, 600 miles from their foundery. She was a nicely modeled stern-wheel boat with a spoon bow, and of light draft. No traffic came to her, however, in this region, and four years afterward she was brought down from Farewell bend to Lewiston. She jumped over falls nearly three feet high, and had her guards badly smashed. She was brought down this same year to Celilo, and, with the Nez Percé Chief, came over the Tumwater falls, and served as a cattle-boat till 1873, when she was taken through to Portland and exchanged for the Annie Stewart. She was put on the Upper Willamette, and one day, just below Salem, she struck a snag and sunk. She had come through untold dangers to be finally lost in a comparatively safe river. Her machinery went into the Champion, on the Upper Willamette. The demand for grain-carriers of light draught was felt soon after this region began to produce crops, and the New Tenino was found to draw too much water, and was available for only about four months in the year. This led to the construction of the Almota. She was modeled after the Occident, on the lower river, and was a successful boat.

During the Nez Percé war, it is said, she made one \$14,000 trip. When the Yakima was worn out her engines were altered somewhat and a new hull was built to receive them. She was then called the Annie Faxon, and was 170 feet long, 36 feet beam, and measured 708.66 tons. Being a good carrier she made an enviable reputation.

The Northwest, of 356.18 tons, built as an opposition boat to the Faxon, was a remarkably good low-water boat, and could navigate the Snake river at all stages. In August, 1878, she took General Howard's command up to the mouth of the Grande Ronde. The increase of the grain trade in 1877 created a demand for still more carriers. In 1876, 19,000 tons were brought down by the Oregon Steam Navigation Company's boats, and the amount was more than doubled the following year. The Spokane, of 673.38 tons, was built in August of that year by this company. The John Gales, of 673.38 tons, was built in 1878 at Celilo. The Harvest Queen, of 718.63 tons, was also built in this year. She was 200 feet long, 38 feet beam, and 5 feet hold, with 72 water-tight compartments, and had two 24-inch cylinders of 8-foot stroke. She was a well finished and fast boat.

We have already more than once spoken of the Oregon Steam Navigation Company. This company, which came to absorb such a large share of the traffic of this region, was organized in 1860. The principal incorporators of the original company were Captain Thomas W. Lyles, L. A. Sanderson, E. T. Weeks, and Abner H. Baker, of San Francisco; P. and D. F. Bradford, Lawrence W. Coe, and R. R. Thompson, of The Dalles; J. C. Ainsworth, S. R. Reed, W. S. Ladd, and George W. Murry, of Portland. Captain Ainsworth was its first president, and George W. Murry, secretary. In 1879 the Oregon Railway and Navigation Company was formed, taking the property of the Oregon Steam Navigation Company and the Oregon Steamship Company as a basis, the last-named company operating a line of steamers between Portland and San Francisco. The operations of the Oregon Railway and Navigation Company have been of a peculiar character, combining rail, ocean, and river lines.

Beginning at San Francisco, California, as its extreme southern terminus and point of connection with the great transportation systems of the Union, it reaches along the coast to the Columbia river, up that river and its principal tributaries, the Willamette and Snake rivers, a total distance of nearly 1,200 miles, of which 550 miles represent ocean, and the remainder mixed river and rail transportation. The ocean traffic in 1880 was conducted by a company consolidated from a number of companies which had done business for many years. Much of the business comes from the Columbia river, and the whole is now controlled by the Oregon Railway and Navigation Company. The river transportation begins at Astoria and flows to and from the city of Portland, 110 miles from the ocean. A share of it originates on the Willamette, but the bulk comes down the Columbia and Snake rivers from the rich valleys of the upper rivers as far as Lewiston, Idaho. The fact that in spite of the increased facilities on the river, they were able to carry out to tide-water only about one-half of the wheat of the Walla Walla and Snake river regions in 1879, convinced the company that the river traffic had outgrown the existing system of transportation, and a railroad was substituted for the steamboat service on the Upper Columbia. In fact, the North Pacific railroad now indirectly controls the transportation. The rail lines projected in 1879 were a main line along the south bank of the Columbia from Celilo to Wallula landing, the terminus of the Walla Walla and Columbia River railroad, a distance of 115 miles, completed in 1880; a continuation of the main line from the river in a southerly direction over the range known as the Blue mountains, and through the Grande Ronde valley to the town of La Grande and to Baker City, a distance of about 150 miles; a line from the town of Walla Walla in a northeasterly direction to Grange City, on the south bank of the Snake river, 57 miles, with branches to Pataha City and Tukannon river, 36 miles, and to Dayton on the Touchet river, 18 miles; a line from Texas Ferry landing, on the north bank of the Snake river opposite Grange City, in a northeasterly direction to the towns of Colfax and Farmington, with a branch to Moscow, in Idaho territory, 124 miles in all. A road through to Portland is also in progress. The lines referred to above, when completed, will give this company command of a railroad system not far from 600 miles in length. Add to this 225 miles constructed by the North Pacific, and a network of road over 800 miles will receive and discharge the traffic of this region at Portland.

The following tables, compiled from the records of the inspection service, show the steamers in existence in 1860, and the growth and inspection of active tonnage from that date to 1880:

Name.	When built.	Where built.	Tonnage.	Remarks.
Julia.....	1858	Port Gamble.....	210	
Carrie Ladd.....	1858	Oregon City.....	172	
Mountain Buck.....	1857	Portland.....	161	
Hassalo.....	1857	Cascades.....	173	
Colonel Wright.....	1859	Des Chutes.....	98	
Idaho.....	1860	Cascades.....	279	
James Clinton.....	1856	Camshah.....	105	
Surprise.....	1857	.....do.....	220	
Onward.....	1858	.....do.....	200	
Rival.....	1859	.....do.....	100	
Cowlitz.....	1856	Portland.....	80	
Multnomah.....	1854	.....do.....	75	
Jenny Clark.....	1856	.....do.....	100	
Vancouver.....	1854	.....do.....	64	
Senorita.....				
Belle.....	1854		52	
Carolitz.....	1858		43	
Tenino.....	1860		190	
Express.....	1856		80	
Moose.....				Laid up.
Mary.....	1854	Dalles.....	80	Do.
Wasco.....				Do.
Eliza Anderson.....	1858	Portland.....	400	Puget sound.
Wilson G. Hunt.....	1840	New York.....	312	Do.

In the following table we have a statement of the annual inspection of steamboats at Portland, Oregon, from 1862 to 1880, and at Puget Sound, from 1871 to 1880, inclusive:

Years.	PORTLAND.		PUGET SOUND.	
	No.	Tonnage.	No.	Tonnage.
1862.....	25	2,823		
1863.....	24	3,359		
1864.....	27	3,745		
1865.....	25	4,438		
1866.....	26	4,074		
1867.....	34	8,036		
1868.....	20	5,391		
1869.....	53	10,274		
1870.....	53	9,581		
1871.....	50	10,388	20	2,352
1872.....	50	9,224	22	2,705
1873.....	55	12,358	25	3,109
1874.....	57	12,696	24	3,117
1875.....	64	15,690	22	3,286
1876.....	61	16,125	36	4,399
1877.....	71	19,548	37	5,016
1878.....	81	24,041	42	4,622
1879.....	92	26,789	39	4,600
1880.....	91	24,650	36	4,480

## CHAPTER II.—UNITED STATES INTERESTS.

## SUMMARY—MERCHANT MARINE.

(See Chapter III, Tables I, II, III, and IV.)

The steam-navigation interests of the United States, comprising 5,139 steamers and representing \$112,005,600 of capital, are divided in Table I into three interests:

First. Those steamers navigating the waters that are under the laws and regulations of the general government.

Second. Those that are employed on waters within the states, and which have no navigable outlet, and are therefore not subject to these regulations, but to state authority.

Third. Those running on the canals, most of which are subject to these regulations and laws where they come out into United States waters.

The increase in the number of boats compared with those reported by the register of the treasury is due to the enumeration of this state water interest, and a large number of yachts and launches under 5 tons which are not enrolled by the customs authorities.

The tonnage of these aggregate interests was 1,221,206.93 tons, and the steamers were valued at \$80,192,495. Regarding this valuation, it was thought best to take the estimates of the United States local inspectors, who, from their familiarity with the steamers, may be considered as experts. A valuation is placed upon each boat that comes under inspection, based upon the condition and age of the hull and boilers and the capacity of the engines, and it may therefore be considered as nearly correct as it is possible to attain. On state waters, where there is no inspection, the value and tonnage have been given by the owners or by experts.

There were 56,811 persons employed on these steamers as regular crews, and to this number should be added 7,032 "roustabouts" employed on steamers navigating the western rivers. This transient help, however, fluctuates according to the amount of business and the season.

Gross earnings amounted to \$85,091,067, equaling 76 per cent. on the capital invested. It will be seen in Table II that these percentages range from 57.1 per cent. in the New England states to 146.5 per cent. on the Upper Missouri river. Actual figures for one steamer on this river show that the gross earnings were 221.4 per cent. on the capital invested in the boat. These figures will not seem disproportionately large when the precarious nature of the business and the heavy expense of maintaining and running the lines are considered.

The total number of passengers carried during the year reached 168,463,001, and included 14,924,655 regular passengers and 153,538,346 ferry passengers, excluding railroad transfers where the cars were transported. As there were 197 passengers lost during the year, this would make an average of one in 855,142 for both regular and ferry traffic, and excluding the latter it would show a loss of one in 75,760. The loss of life among passengers, employes, and others by fires, explosions, collisions, wrecks, and snags, was, however, comparatively large for the season of 1880, amounting to 320 persons.

The freight movement of 25,451,404 tons, as reported, represents the amount carried, excepting in the one instance of the Saint Louis barge lines, which reported 867,120 tons towed in model barges, representing the grain and ice trade with New Orleans and the lower river.

The consumption of coal by the steamers of the United States reached 3,827,993 tons, making an average of 3.13 tons to the ton of measurement. It will be seen on state Table VI that these averages for the western rivers are comparatively large, indicating a great waste of fuel, and suggesting improvements in machinery on these waters.

In Table II the statistics of certain natural groups are given, in which the interests therein are, to some extent, in common. These groupings necessitated the division of some of the states, the exclusion of state water interests, and the canal tonnage and traffic at Buffalo and Chicago in Group II. This table, therefore, represents the tonnage afloat upon United States waters.

Table III represents the state water interests of the country, which, with the exception of the state of Maine and lakes Chautauqua in New York and Tahoe in California, are without inspection laws or any traffic regulations. The business is mostly confined to summer pleasure excursions, and the season is short and the freight movement comparatively light. No attempt has heretofore been made to collect these statistics, which should be of great interest to state legislators, with reference to the passage of laws requiring inspection and preventing overloading with passengers, and consequent loss of life. Out of an annual movement of 774,395 passengers on state waters, approximately 551,129 passengers were carried on steamers not inspected.

CLASSES AND AVERAGES ON UNITED STATES WATERS.

Of the 4,778 steamers operating on United States waters, as shown in Table II, 1,414 were passenger steamers, 418 held licenses as ferry steamers, 466 were freight steamers, 1,869 were towing steamers, 109 fishing steamers, and 502 were classed as yachts.

In the following tables, which are worked out of Table II, a statement of the number, tonnage, value, and crews, with averages for each class of steamers on United States waters are given, classified according to the certificates of inspection :

PASSENGER.

Number of group	Name of group	Number.	Tonnage.	Average tonnage.	Value.	Average value.	Crew.	Average crew.
The United States		1,414	686,486.34	485.46	\$45,940,400	\$32,400	20,887	21
I	New England states	102	87,758.81	541.72	5,764,000	35,580	3,607	22
II	Northern lakes	141	56,471.26	400.50	3,559,500	25,245	2,719	19
III, IV, VI, X	Western rivers	453	100,452.14	354.20	6,032,800	15,304	10,082	22
V	Middle states	295	255,205.25	865.10	20,591,000	69,800	8,500	29
VII	Gulf of Mexico	64	37,043.86	578.61	2,970,000	46,406	1,560	24
VIII	South Atlantic coast	103	22,729.81	220.68	1,908,900	18,533	1,153	11
IX	Pacific coast	196	66,775.21	340.69	4,214,200	21,501	2,216	11

FERRY.

The United States		418	127,140.80	304.17	\$6,872,450	\$16,441	3,305	8
I	New England states	31	9,857.03	317.97	552,700	17,829	187	6
II	Northern lakes	23	3,624.26	129.43	340,500	12,161	125	4
III, IV, VI, X	Western rivers	177	21,306.59	120.38	1,022,900	5,779	885	5
V	Middle states	140	68,744.92	491.04	3,443,750	24,598	1,755	13
VII	Gulf of Mexico	2	39.30	19.65	1,500	750	6	3
VIII	South Atlantic coast	8	1,574.71	196.88	82,000	10,250	63	8
IX	Pacific coast	32	21,993.99	687.31	1,429,100	44,659	284	9

FREIGHT.

The United States		466	219,961.83	472.02	\$11,366,800	\$24,392	6,915	15
I	New England states	28	10,534.87	376.25	370,200	13,221	501	18
II	Northern lakes	202	139,154.16	688.68	7,694,300	38,091	3,793	19
III, IV, VI, X	Western rivers	50	5,923.68	118.48	127,100	2,542	466	9
V	Middle states	122	56,046.26	459.39	2,769,000	22,697	1,689	14
VII	Gulf of Mexico	13	2,401.95	184.77	117,200	9,015	110	8
VIII	South Atlantic coast	23	2,283.69	99.30	88,300	3,839	128	6
IX	Pacific coast	28	3,617.22	129.18	200,700	7,168	228	8

TOWING.

The United States		1,869	142,219.06	76.09	\$12,395,800	\$6,632	12,864	7
I	New England states	108	4,659.42	43.14	531,000	4,925	587	5
II	Northern lakes	426	20,274.95	47.59	1,978,800	4,645	2,098	5
III, IV, VI, X	Western rivers	477	63,224.95	132.55	3,800,500	7,968	5,020	11
V	Middle states	675	43,478.08	64.41	4,899,800	7,259	4,258	6
VII	Gulf of Mexico	42	2,087.05	49.69	180,800	4,305	281	6
VIII	South Atlantic coast	39	3,936.12	44.22	389,400	4,375	413	5
IX	Pacific coast	52	4,558.49	87.65	614,600	11,819	257	5

FISHING.

The United States		109	7,568.52	69.44	\$835,500	\$7,665	1,079	10
I	New England states	62	4,970.67	80.18	530,600	8,568	594	10
II	Northern lakes							
III, IV, VI, X	Western rivers							
V	Middle states	32	2,467.15	77.09	285,000	8,906	418	13
VII	Gulf of Mexico							
VIII	South Atlantic coast	15	130.70	8.73	19,900	1,327	67	4
IX	Pacific coast							

## YACHTS.

Number of Group.	Name of group .....	Number.	Tonnage.	Average tonnage.	Value.	Average value.	Crew.	Average crew.
The United States.	.....	502	11,562.43	23.03	\$1,437,375	\$2,863	1,453	3
I .....	New England states .....	72	772.94	10.74	141,150	1,960	169	2
II .....	Northern lakes .....	150	2,765.32	18.44	345,825	2,306	403	3
III, IV, VI, X .....	Western rivers .....	41	885.49	21.59	126,100	3,076	131	3
V .....	Middle states .....	195	6,861.60	35.19	775,300	3,976	648	3
VII .....	Gulf of Mexico .....	5	38.51	7.70	3,300	660	12	2
VIII .....	South Atlantic coast .....	28	178.10	6.36	26,800	957	62	2
IX .....	Pacific coast .....	11	59.97	5.45	18,900	1,718	23	2

## GROUP I.—SUMMARY—NEW ENGLAND STATES.

(See Chapter III, Table V.)

At the close of the census year in 1880 there were in the New England states, including state waters, 515 steamers of all classes, measuring 120,177.83 tons and valued at \$8,038,150, while the capital invested reached the sum of \$13,943,350. On the waters of the United States represented in Group I there were 463 steamers measuring 118,553.74 tons, valued at \$7,890,550, with \$13,743,200 invested. This includes a large number of small yachts and excludes several large steamers that were virtually out of existence, but not so returned to the customs authorities. On state waters, as shown in Table III, not subject to customs and inspection laws, there were 52 steamers measuring 1,624.09 tons, valued at \$147,600.

The passenger movement by these 463 steamers amounted to 15,474,710, and was divided into 12,029,889 ferry, and 3,444,821 regular and excursion passengers. An analysis of this movement, as far as it is practicable to make it, shows a movement on Long Island sound of 937,338 passengers. During the season, between Boston and the ports of Maine, the movement amounted to 113,500 passengers, and between Boston and the ports of Nova Scotia, New Brunswick, and Prince Edward island it approximated 45,000. Besides 11,261,935 passengers carried by the ferries of Boston, there were 852,367 teams, carriages, carts, and horses reported transferred, which were not reduced to tons and not included in the footings of tables.

The number of lives lost by accident was 29, of which 27 were passengers, making an average of one in 127,586 regular and excursion passengers carried, or, including ferry traffic, one in 573,137.

The freight traffic of the steamers of Group I, amounting to 2,610,416 tons, represents the amount carried, the towing lines not reporting, owing to the desultory nature of the business. Of the amount of freight transported 402,760 tons were reported by ferry and transfer companies. The freight movement by the Sound lines reached 1,470,235 tons, while the ocean lines to Philadelphia and Savannah, from Boston and Providence, moved 244,847 tons. The movement north, from Boston to the ports of Maine, amounted to 188,500 tons, and to the ports in the Dominion of Canada it approximated 100,000 tons. The balance, 204,074 tons, represents local movements in United States waters. On state waters the freight traffic, exclusive of lumber, was reported at 18,120 tons.

Gross earnings are exhibited in the tables, and for the New England states they equaled 57.1 per cent. on the capital invested.

There was \$2,667,135 paid for service on the 463 steamers. As the number of hands employed was 5,645, wages averaged \$472.47. Going south, where the season is longer, we find this average is increased excepting on the western rivers, where it is reduced by the employment of a large number of cheap laborers, known as "roustabouts".

The relation of the leading lines to the railroads of the New England states, with the exception of those on Long Island sound and lake Champlain, are rather remote. As a general thing they are represented in the ticket and passenger agents' associations, and some lines are bonded with roads running through the Dominion of Canada for the transportation of goods in bond.

There were some 60 regular lines in the New England states, representing \$10,639,813 of capital, and 149 steamers measuring 81,443.23 tons, with an aggregate of 6,023 miles of routes. Of the fuel used on these steamers a very large proportion was anthracite coal; hence the low average per ton of custom-house measurement, amounting to 3.16 tons per ton of measurement.

GROUP II.—SUMMARY—NORTHERN LAKES.

(See Chapter III, Table V.)

On the northern lakes, embracing the steamboat interests of states and parts of states tributary to these waters, but excluding lake Champlain, there were at the close of the census year 947 steamers of all classes, measuring 222,290.45 tons, valued at \$13,918,925, with \$16,978,108 of capital invested. They gave employment to 9,143 men, and there were paid for services \$3,293,964, making an average of \$360 27 per man exclusive of shore help. The passenger movement, amounting to 1,356,010 persons carried, may be divided into 926,250 regular and excursion passengers, and 429,760 ferry passengers, not including the transfers of the Canada Southern Bridge Company at Stony island near Detroit, with one of their boats an American bottom. The freight movement reached 4,368,171 tons, exclusive of lumber carried, which approximated 318,889,000 feet. The lumber that was towed during some stage in its journey from the forest and mill to the manufactory would include a large share of the 4,497,211,000 feet cut on the upper and lower peninsula of Michigan as well as a large portion of the lumber production of Wisconsin. It is impracticable to show this movement by the tugs employed in this line of traffic, but there were some 70 steamers, measuring 23,300.84 tons, and valued at \$1,302,500, engaged in *carrying* this production, as reported.

In the grain trade the number of steamers approximated 67, measuring 80,669.12 tons, and valued at \$4,777,700, and in the ore trade there were some 38 steamers, measuring 36,145.93 tons, and valued at \$1,750,500. These figures can be given only approximately, as steamers may run part of the season in ore and the rest in grain. The practice of steam barges towing one or more vessels has become general on the northern lakes, so that a very large proportion of the freight moved there is by steam. Some idea of the ore movement on the northern lakes will be gained from the following table, prepared by Charles G. Osburn, collector of customs at Marquette, which shows the distribution of iron ore shipped from Marquette, Escanaba, and L'Anse for the season of 1880, by steam and sail:

To—	From Marquette.	From Escanaba.	From L'Anse.
	Tons.	Tons.	Tons.
Gross tons .....	585, 122	•1, 040, 207	53, 003
Cleveland, Ohio .....	341, 733	314, 034	11, 283
Ashtabula, Ohio .....	103, 395	165, 059	15, 347
Chicago, Ill .....	24, 451	188, 465	1, 785
Erie, Pa.....	33, 863	90, 340	3, 177
Milwaukee, Wis .....		64, 480	
Fruitport, Mich.....		27, 414	
Saint Joseph, Mich .....		27, 136	
South Chicago, Ill ..		26, 838	
Wyandotte, Mich .....	200	22, 576	2, 249
Detroit, Mich .....	23, 858	18, 343	12, 128
Elk Rapids, Mich .....		17, 971	
Fairport, Ohio .....	12, 127	18, 833	
Leland, Mich .....		14, 225	
Green Bay, Wis.....		12, 600	
De Pere, Wis .....		12, 380	
Frankfort, Mich .....		11, 174	1, 072
Buffalo, N. Y .....	3, 692	3, 380	
Pine Lake, Mich .....		3, 198	
Caseville, Mich .....	367	2, 883	
Toledo, Ohio .....	7, 800	2, 685	
Michigan City, Ind .....		2, 655	
Grand Haven, Mich.....		1, 002	
Sandusky, Ohio .....	10, 707	1, 955	
Charlevoix, Mich .....		662	
Black River, Ohio .....	16, 042		
Duluth, Minn .....	5, 870		5, 962
Black Rock, N. Y .....	1, 017		

The fuel consumed by the steamers on the northern lakes was reported at 483,610 tons of coal and 255,629 cords of wood, the latter consisting largely of slabs and poor grades of wood and refuse used in the towing steamers in the lumber regions of Michigan and Wisconsin. The coal consumed was largely of the bituminous variety, mined in southern and central Ohio, and for this reason a comparison with that used on the Ohio and Mississippi rivers is made with a similar fuel in use in both instances. Such wanton extravagance in the use of fuel is shown on the rivers where speed and quick returns are all that seem to be desired, that a statement of what is possible

with the best machinery now in use may be of interest to river navigators as well as to those engaged in lake commerce. The following table, kindly furnished by E. T. Evans, esq., western manager of the Erie and Western Transportation Company, gives the best results of compound engines and propellers on the lakes:

*Statement of Erie and Western Transportation Company's Buffalo and Chicago line, showing steamers, carrying capacity, trips made, miles run, average speed, and coal consumption, season of 1881.*

Names of steamers.	Actual carrying capacity in tons of 2,000 pounds.	Style of engine.	Trips made.	Tons of coal consumed per trip.			Total miles run during season.	Season averages.	
				Average.	Maximum.	Minimum.		Pounds of coal consumed per hour.	Speed per hour in geographical miles.
Arizona.....	1,000	Compound.....	13	104	123	85	26,765	853	9.02
Lehigh.....	2,400	.....do.....	12	117	131	90	21,498	1,034	10.06
Clarion.....	2,425	.....do.....	4	128	135	126	6,670	1,097	9.66
Philadelphia.....	1,550	Condensing.....	14	153	205	120	25,138	1,527	9.52
Alaska.....	1,575	Compound.....	13	103	135	80	24,638	987	9.82
Lycoming.....	1,950	.....do.....	15	116	127	102	27,128	1,037	9.39
Conemaugh.....	1,875	.....do.....	12½	118	142	105	22,794	953	8.72
Delaware.....	2,100	.....do.....	13½	125	157	95	24,236	1,066	8.94
Conestoga.....	2,075	.....do.....	13	139	165	116	24,069	1,150	8.66
Juniata.....	2,000	.....do.....	13½	127	139	111	24,765	1,161	9.31
Wissahickon.....	2,025	.....do.....	14½	117	145	90	27,794	1,052	9.33
Gordon Campbell.....	1,275	.....do.....	11	119	142	100	20,164	923	8.36
Annie Young.....	1,025	Syphon condensing.....	12½	114	139	95	22,433	1,008	8.77

Of the 947 steamers owned on the northern lakes, 141 were passenger steamers, measuring 56,471.26 tons, and averaging 400.50 tons each; 28 ferry steamers, measuring 3,624.26 tons, and averaging 129.43 tons each; 202 freight steamers, measuring 139,154.16 tons, and averaging 688.88 tons; 426 towing steamers, of 20,274.95 tons, with an average of 47.59 tons, and 150 yachts, measuring 2,765.82 tons, and averaging 18.44 tons. In 1851 the average tonnage of steamers on the northern lakes was given at 437 tons. The increase in the number of tugs and yachts since that date has reduced their average to 235 tons at the present time. The maximum tonnage in 1880 was 2,082 tons, while the maximum of actual carrying capacity was about 2,400 tons. With the completion of the government's improvements in the Detroit river, which are now well advanced, it is expected that the maximum tonnage of steamers will be increased to 2,800 tons.

There is one large combination or pool of lines at Buffalo under the name of the Lake Superior Transit Company, in which the following lines are represented: Western Transportation Company, Union Steamboat Company, Erie and Western Transportation Company or Anchor Line, and the Detroit and Cleveland Steam Navigation Company. The Lake Superior Transit Company owns no boats, but it runs them in a line of this name created and existing under the laws of the state of New York, for convenience in transacting the lake Superior business, to which it is confined exclusively. The Goodrich Transportation Company, of Chicago, chartered, however, under the laws of Wisconsin, is another large corporation operating on lake Michigan.

### GROUP III.—SUMMARY—UPPER MISSISSIPPI RIVER.

(See Chapter III, Table V.)

On the Upper Mississippi, including the river interests of the states of Minnesota, Wisconsin, Iowa, Illinois, and Missouri, there were owned in 1880, 366 steamers, measuring 83,918.09 tons, valued at \$3,004,050, with \$6,086,760 of capital invested in steamers, barge lines, and appurtenances. The barge interests in this region are of so much importance and so closely connected with the steamboat traffic that the freight movement in barges is given in the tables.

The crews of the steamers numbered 4,874 persons. Adding 2,950 roustabouts employed here, we have a grand total of 7,824 persons, to whom was paid for service \$2,204,644 making an average of \$281 77 per annum. The season of 1880, however, was a very short one, which served to reduce this average to some extent.

Gross earnings for this group in 1880 were \$7,668,864, or 126.7 per cent. on the capital invested, comparing favorably with other sections of the western rivers. Outside of the great barge lines of Saint Louis and one or two leading lines managed with care, there were limited margins of profits realized. Steamboat lines running in competition with the barge lines have met with strong competition, and freights have been reduced to the lowest possible figures, the barge system having an advantage even in competition with the railroads. The freight movement reached 3,500,035 tons, including, as stated, the traffic reported by the barge lines of Saint Louis, amounting to 867,120 tons. Excluding this, the actual amount carried by the steamers of this group was 2,632,915 tons. The growth of this model barge system on the western rivers has been steady for the past four years, and it is now assuming an importance in the commerce of the west worthy of attention.

Of the better class of barges, known as "model barges", there were on the Mississippi and Ohio 286 reported to this office, measuring 158,771.50 tons actual capacity, and valued at \$1,335,000. At Saint Louis, mostly engaged in the grain trade, there were 191, measuring 124,919 tons, and valued at \$926,000. In the movement of bulk grain and heavy freights this system is gradually supplanting the ordinary steamer, and it has many advantages. By economy of time and steady movement, the barge tug will equal the steamer in speed, making the run from Saint Louis to New Orleans with five to seven barges in about five days at a cash expense of \$1,000. The round trip will not exceed sixteen or seventeen days. The capacity of the barges varies from 18,000 to 100,000 bushels, the medium being about 35,000 bushels, so that an average tow consists of seven barges containing 232,834 bushels or about 7,000 tons. The cost of transportation of grain from Saint Louis to New Orleans varies, but ranges from 5 cents up to 10 cents per bushel.

The rates on bulk corn for 1880 were as follows:

	Cents per bushel.
January and February.....	9 to 9½
March.....	8 to 8½
April, May, June, and July.....	7 to 7½
August.....	8 to 8½
September, October, November, and December.....	9 to 9½

Adding to the 7½ cent rate which prevailed in April, May, June, and July one-half cent per bushel for transferring from the barge to the ocean steamer, and one-tenth cent for inspection, we have 8½ cents as an average rate on board the ocean steamer at New Orleans. The rate from New Orleans to Liverpool was about 16 cents per bushel for this period, making 24½ cents as the rate through from Saint Louis, exclusive of insurance. This through rate, however, has ranged from 18½ to 26½ cents per bushel. Mr. George King, jr., late vice president of the Baltimore and Ohio Railroad Company, in his report to the joint executive committee of east and west trunk lines, in the spring of 1881, states that on March 20 the total charges for transporting grain from Saint Louis to Liverpool, via New Orleans, including river rates, ocean rates, insurance and transfer charges at New Orleans, amounted to 46.74 cents per 100 pounds, or 28 cents per bushel, and that at the same time the total charges for transportation of grain from Saint Louis to Liverpool, via New York, including rail and ocean rates and all incidental charges, amounted to 60.44 cents per 100 pounds, or 36½ cents per bushel, making 8½ cents in favor of the New Orleans route. The movements of grain, however, by this route are subject to great fluctuations.

The passenger movement in this group, amounting to 1,299,553 passengers carried, may be divided into 341,371 regular passengers and 958,182 ferry passengers, exclusive of railroad transfers.

The fuel consumed here, as on other sections of the rivers, owing to the construction of their boilers and the use of such a high pressure of steam, with small diameter of cylinder, was enormous. The coal was reported at 525,331 tons or 6.26 tons to the ton of measurement, and the wood amounting to 93,318 cords or 1.11 to the ton of measurement.

John Schaffer, esq., United States local inspector of steam-boilers at Saint Louis, says, in discussing this fuel question:

I will state, in addition to your inquiries, that I have engineered western river steamers about twenty-five years; during that period have run high-pressure, compound, and low-pressure boats; have used exclusively cylindrical-fueled boilers, but I am of the opinion a properly-constructed fire-box boiler, with return flues and low-pressure engine, with an independent engine to work air-pumps, could be used with more economy on our largest steamers than the present high-pressure now in use.

The view taken from experience is that the cylindrical-fueled boiler is fired on the outside shell inclosed by masonry. The loss by this in heat will be 15 per cent. by radiation, whereas in fire-box form, by firing inside, there is scarcely any loss comparatively. The heat in a high-pressure boiler, at so great a pressure of steam, say 170 pounds working pressure per square inch, will be 373 degrees, whereas in low-pressure boiler, at 30 pounds steam working pressure per square inch, it will be 250 degrees heat in boiler, showing a difference of 123 degrees. The engines on high-pressure boats of the largest class use cylinders 26 inches diameter, 10 feet stroke, turning a water-wheel 36 feet diameter, 15 feet length of bucket, working pressure of steam 170 pounds per square inch. The area of this cylinder, which is 330 square inches, with the above pressure, will give 90,100 pounds on the crank-pin. With a low-pressure cylinder, 52½ inches diameter, 30 pounds steam and 24 inches vacuum will equal the same force on crank-pin as the high-pressure engine with 123 degrees less heat and 140 pounds less steam in boilers, which is all at the expense of fuel; showing that low pressure is certainly the best economy when room and weight are not serious objections.

#### GROUP IV.—SUMMARY—OHIO RIVER.

(See Chapter III, Table V.)

There were 473 steamers owned in the states tributary to the Ohio river in 1880. These measured 107,472.48 tons, and were valued at \$5,661,500. A few of these steamers were employed on the Lower Mississippi river, but as the property was owned here and the companies organized under the laws of these states, their interests are shown in this group. The capital invested was reported at \$6,051,522, Pittsburgh contributing \$2,258,050, mostly invested in her great coal transportation interests. The gross earnings for the season were \$7,628,924, equaling 126 per cent. on the capital invested. Notwithstanding this large income, but few companies divided more than a nominal per cent., as expenses and losses reduce margins to a great degree, when compared with this traffic in other waters.

It cannot be said that steamboatmen are neglectful or indifferent to their interests in this respect, as the nature of the traffic requires a large number of employes, and the light draught so desirable in river craft prevents the use of fuel-saving machinery, which is generally heavy and cumbersome, while insurance ranges from 8 to 18 per cent. These steamers gave employment to 7,090 men, serving in the capacity of officers and crew, and in addition to these there were approximately 2,000 "roustabouts" employed in handling freight. The wages of the latter are included in the expense accounts of the steamers, but it is a difficult matter to arrive at the exact number thus employed, as they are transient, and more are required at certain seasons of the year than at other times when business is slack. The crew and wages, on the Ohio river, of an ordinary 500-ton steamer, carrying both passengers and freight, is about as follows:

	Monthly wages.	Total.
1 master .....	\$125 00	\$125 00
1 mate .....	80 00	80 00
1 second mate .....	50 00	50 00
3 clerks:		
One .....	100 00 to 150 00	} 220 00
One .....	50 00 to 80 00	
One .....	25 00 to 35 00	
1 watchman .....	30 00	30 00
2 pilots .....	125 00	250 00
1 engineer .....	85 00	85 00
1 second engineer .....	50 00	50 00
1 striker .....	30 00	30 00
2 steersmen .....	(*)	
1 steward .....	60 00	60 00
1 second steward .....	20 00	20 00
1 carpenter .....	60 00	60 00
10 cabin crew .....	15 00	150 00
2 (cook and assistant) .....	135 00	135 00
2 chambermaids .....	30 00	60 00
2 deck hands .....	30 00	60 00
1 sweeper .....	10 00	10 00
6 firemen and ashmen .....	30 00	180 00
30 roustabouts .....	25 00	750 00
70 Total .....		2,405 00

\* Generally nothing, as they are seamen, and boats board them.

The crew and wages of a Pittsburgh coal tow-boat are as follows:

	Per month.		Per month.
1 master .....	\$125	1 steward .....	\$50
2 pilots, each .....	150	1 cook .....	50
1 first engineer .....	150	1 chambermaid .....	20
1 second engineer .....	75	1 carpenter .....	50
1 mate .....	75	6 firemen, each .....	45
1 watchman .....	40	16 roustabouts, each .....	30

The passenger traffic, exclusive of railroad transfers, amounted to 3,961,798, and was divided into 960,936 regular passengers carried and 3,000,862 ferry passengers. It was found impracticable to give an analysis of this movement, as it would include every little town along the rivers.

There were five lives lost among the passengers transported, and eight employes were killed, four by the bursting of steam-pipes and four by a powder explosion while engaged in handling it as freight.

The freight movement, amounting to 2,446,353 tons for the season, did not include that transported by the model barge lines, nor the coal traffic, the shipments of which from Pittsburgh alone in 1880 reached 2,521,518 tons. This coal was distributed as follows: Cincinnati, 1,026,259 tons; Louisville, 1,378,407 tons; Saint Louis, 69,482 tons; Iron-ton, 29,222 tons; and Madison, 18,148 tons. This and the model barge interests required of the Pittsburgh tonnage alone 120 towing steamers, measuring 26,166.76 tons, with \$1,790,050 of capital invested, while 1,774 men were employed upon the boats. The flat and barge interest that operates in connection with these towing steamers has 2,768 barges, measuring 695,052.51 tons, valued at \$2,715,000, and 800 flats, measuring 56,000 tons, and valued at \$320,000, so that the barge and towing interests of Pittsburgh approximate \$4,825,050. The shipments of coal from Pittsburgh for the past twelve years were as follows:

	Tons.		Tons.
1869 .....	1,583,926	1876 .....	2,297,222
1870 .....	1,525,000	1877 .....	1,855,933
1871 .....	1,724,518	1878 .....	2,254,050
1872 .....	2,104,963	1879 .....	2,435,722
1873 .....	2,167,352	1880 .....	1,465,865
1874 .....	2,186,129		2,521,518

This coal is mined along the banks of the Monongahela river, which has been improved by a series of dams and locks, dividing it up into what are called pools or pockets. Here the small tows, consisting of three or four loaded barges, are made up and taken out through the locks to Pittsburgh, where they are combined in still larger tows for transportation to Louisville. Here they are again combined into immense tows of thirty or more barges and boats for the final trip down the Mississippi. The steamer is put behind these barges and all are bound together in one firm mass by means of ropes and chains tightened by ratchets, and the steamer used as a rudder to guide the field of barges around the bends in the river, great skill being required in the strong currents in performing this task, called "flanking". To transport coal in barges from Pittsburgh to Cincinnati and Louisville, and tow the empty barges back, costs 2 cents per bushel or 54 cents per ton, the barges holding, say, 12,000 bushels of 76 pounds to the bushel. To transport coal in coal-boats to points beyond Louisville costs, to Cairo, 2 cents; to Memphis, 2½ cents; and to New Orleans, 3 cents per bushel, with no consideration for returning boats, which are generally torn up for the lumber after unloading, for the reason that a new boat can be built for about what it costs to tow the old one home. Coal-boats contain about 24,000 bushels or 900 tons, and cost from \$700 to \$800 when new. A tow from Pittsburgh to Louisville consists of from 12 to 16 barges, or 8 to 10 coal-boats, and from Louisville to points below, from 16 to 20 boats and barges. One of the largest tows that was ever taken down from Louisville contained 38 pieces, measuring 862 feet in length, 260 feet in width, and contained 679,854 bushels, and beside this the steamer carried 19,500 bushels, making a grand total of 699,354 bushels, or 25,902 tons. It is claimed that in this traffic is found the cheapest freight rate in the country, as coal has been put into New Orleans, 2,000 miles from Pittsburgh, at 60 cents per ton. In August, 1876, corn was taken from Chicago to Buffalo at 1½ cents per bushel, which was the lowest rate on the lakes during the past ten years, and would equal 87 cents per ton for 2,000 miles, but it is needless to say that the rate was at a loss to the carrier. The coal consumed by these 473 steamers navigating the Ohio river amounted to 676,347 tons, equal to 6.29 tons to the ton of measurement, while the wood consumed was only 16,474 cords, or 0.15 cord to the ton of measurement. Augustus Moore, esq., United States local inspector of steam boilers, of the Cincinnati board, in reply to questions relating to fuel, cylinders, boilers, and the use of steam, says:

First. The necessity for the large amount of fuel consumed on our river steamers, in my opinion, is caused in many instances by reason of the amount of heating surface in the boilers, being of insufficient proportion to the cubical capacity of the engine cylinders, the cylinders themselves being too small for the service expected, thus necessitating the creation of a very high steam pressure, and also the consumption of too great a proportion of the live steam created. The excuse furnished for using the small cylinders is the desire to have as little weight as possible on board in order to insure the lightest draught of water obtainable. Probably the nature of the fuel used has considerable influence as to quantity required.

Second. I know of none of the single-flued boilers being now used on board our river steamers. None contain less than two flues, and the tendency with our steamboatmen at present is to place from 5 to 10 flues in boilers, of various diameters, from 6 inches upward, the flues being either riveted or of "lap-weld manufacture".

Third. While it is not true that they do not receive some benefit from the expansive force of steam, still they have not the advantage of the highest expansion. On lever engines, cut-off cams are used, varying from less than five-eighths stroke to three-fourths and thirteen-sixteenths stroke of piston. The benefit of such expansion as we now possess is interfered with by reason of propulsion being retarded by the current and reaction against propelling wheels.

Fourth. The objections heretofore raised to the use of condensers are, increased weight, undesirable by reason of our steamers, as stated, being limited to as light draught as possible, the first cost, and the heavy outlay for maintenance and repairs. It is also stated that the sedimental nature of the water in our rivers prevents perfect operation, and causes vexation and annoyance. It is claimed by many that no condensing engines heretofore used on our rivers have proved economical or reliable.

On most of our waters the heretofore comparatively low price of fuel and the desire for light-draught vessels has prevented their use, being considered by many of greater value than the supposed economy of fuel by use of condensers. Owing to the small diameters of the engines in use on our river steamers, the benefit they would derive from expansion is not generally considered sufficient to justify the expense and use of condensers.

Personally I am aware of no good reason why the engines on our river steamers should not be constructed and arranged to receive the benefit of high expansion, and think probably the objections raised by our engineers are the result of education and early prejudices imbibed.

There are now in existence and operation apparatus for condensing, the weight of which is inconsiderable, and their low cost, compared with the expense of such as were formerly in use on some of our boats, would justify their use, provided the engine cylinders were of sufficient diameters. This board has frequently advocated the doctrine that there would be economy in the use of large cylinders operated with a greatly reduced steam pressure from that now required, and if such were the case condensers could undoubtedly be used with good results.

A correspondent of the *Pittsburgh Times*, in discussing the fuel question on the western rivers, says:

In continuation of the subject of fast packets for the future, we think that, to make these packets a success, economy in fuel is important. Heretofore the fuel consumed was not of much consequence, but as time rolls on this item becomes an important factor in steamboating. In the years gone by steamboatmen would have nothing but the best lump coal; then, as the consumption of coal increased, prices advanced, and nut coal was used; now nut coal is worth considerable, and commands a fair price in the lower markets, with a steady demand, so that the item of fuel enters largely into the cost of running expenses. In the east they have been paying considerable attention to this for some years past, and many inventors are striving to perfect machines to give the most vaporized water for the least money. A short time ago we made calculations to determine the amount of water evaporated per each pound of coal consumed on several of our western steamboats, with the following result, viz:

	Pounds.
Water evaporated per 1 pound of coal.....	4.93
Water evaporated per 1 pound of coal.....	5.04
Water evaporated per 1 pound of coal.....	6.05
Water evaporated per 1 pound of coal.....	6.75
Water evaporated per 1 pound of coal.....	6.28

Giving for the five boats a mean rate of evaporation of 5.97 pounds. In the east it is claimed that the mean rate of evaporation is 11 pounds per 1 pound of coal, or about double the amount given for our boats. Since the time the above calculations were made our boatmen have been making rapid strides in advance (some of them), with satisfactory results. One of the causes of waste of fuel, and in many cases here the principal cause, is cylinders of small diameter and short stroke, thereby of necessity requiring the full boiler pressure to be used during three-quarters or seven-eighths of the stroke, throwing away at the end of the stroke enough pressure to run any ordinary engine and losing all the benefit to be derived from the expansion of the steam, and the only excuse that is offered is that "it always has been that way, and we don't care to try any new experiments"; but the time will come when all must do their work with the least expense possible in fuel, or the more enterprising ones will compel the rest to stand aside. The question of dollars and cents will in the near future decide this matter.

#### GROUP V.—SUMMARY—MIDDLE STATES.

(See Chapter III, Table V.)

In the middle states there were owned and enumerated 1,459 steamers on United States waters, including quite a number that were operated on the Pacific coast and in the south. They measured 432,803.26 tons, and were valued at \$32,763,850, showing 36 per cent. of the tonnage of the country, and 42 per cent. of the value, while the capital invested equaled 43 per cent. of that in the whole country and reached the enormous amount of \$48,091,084, including, as it does, the interests of the great ocean lines of New York, Philadelphia, and Baltimore. These steamers gave employment to 17,268 persons, or an average of 12 to each steamer. Of the 1,459 steamers owned in Group V, 295, measuring 255,205.25 tons, were passenger steamers, with an average tonnage of 865.10 tons, and representing largely the Hudson river and ocean interests of New York, Philadelphia, and Baltimore, which accounts for the high average. These steamers were valued by experts at \$20,591,000, or an average of \$69,800. Gross earnings, amounting to \$31,856,519 were reported for this group, and equaled 66.2 per cent. on the capital invested. The amount paid for service reached \$8,812,469, showing an average of \$510 33 per man per annum.

The passenger traffic, amounting to 135,653,282 persons transported, may be divided into 103,831 ocean passengers, 7,508,814 inland regular and excursion passengers, and 128,040,637 ferry transfers. The ferries of New York, Brooklyn, and Jersey City carried approximately 116,647,110 persons in 1880. This includes the operations of the ferry steamers owned both in New York and in Jersey City and employed around New York city. Of the freight traffic, amounting to 7,217,415 tons carried, 1,914,853 tons were transported by the ocean passenger steamers of New York, Philadelphia, and Baltimore, including also the Pacific mail; 2,008,533 tons were carried by the inland passenger steamers; 2,139,161 tons by the freight steamers; 1,153,048 tons were reported by the ferry steamers, and 1,820 were reported by steamers classed as yachts. This, it must be remembered, represents the amount carried, as it was found impracticable to state the amount towed. The largest item in this movement was the coal carried by the colliers of the Reading Railroad Company, amounting to 557,885 tons. The fuel consumed in this region, equaling 1,272,857 tons of coal of both varieties, and 12,642 cords of wood, shows an average of 2.94 tons to the ton of custom-house measurement in the first case, and 0.03 cords in the second case. As the coal consumed was of the anthracite variety to a great extent, this average will not seem low. Thirteen colliers of the Reading Railroad Company burned 3.13 tons per ton of measurement in 1880. It will be well to note in all these comparisons that custom-house measurements in nearly every case falls short of the actual carrying capacity of the steamers. The following table, taken from an annual report of the Reading Railroad Company, shows this relation of capacity to measurement, and it will be seen that the former exceeds the latter by over 26 per cent. It also shows the results in ordinary traffic of the modern propeller, with anthracite coal for fuel:

Names of steamers.	Registered tonnage.	Tons, carrying capacity.	1880.		
			Voyages made.	Tons, carried.	Miles run.
Rattlesnake.....	417.44	500	42	20,418	40,248
Centipede.....	436.88	525	46	23,967½	43,196
Achilles.....	763.51	1,025	41	41,756	38,475
Hercules.....	764.33	1,025	36	36,928	35,118
Panther.....	699.10	825	42	34,800½	39,240
Reading.....	1,283.00	1,650	35	56,774	33,307
Harrisburg.....	1,283.00	1,650	35	54,033	37,789
Lancaster.....	1,283.00	1,650	34	55,832½	34,625
Perkiomen.....	1,035.35	1,200	38	46,040	33,162
Berks.....	553.09	600	36	21,443	35,310
Williamsport.....	1,283.00	1,650	35	61,264	37,254
Allentown.....	1,283.00	1,650	31	50,302½	34,064
Pottsville.....	1,283.00	1,650	33	54,236	32,044
Total.....	* 12,367.70	15,600	484	557,885	478,832

\* Coal used, 38,761 tons anthracite, equaling 3.13 tons per ton of measurement for 1880, or 0.03 tons per mile run.

GROUP VI.—SUMMARY—LOWER MISSISSIPPI.

(See Chapter III, Table V.)

We had in 1880 on the Lower Mississippi river, representing river interests alone, 315 steamers, measuring 48,303.06 tons, and valued at \$2,851,550, with \$3,260,450 of capital invested. A few of the large companies operating here are chartered on the upper rivers and their interests are shown there, and these figures are also exclusive of New Orleans ocean interests, which are given in Group VII, and amount to 18 steamers, measuring 25,421.68 tons, valued at \$2,555,000, so that to show the total interests owned at New Orleans one must add these items from Group VII. These river steamers gave employment to 3,959 men comprising regular crews, and 1,696 roustabouts, making a total of 5,655 men, to whom were paid \$1,626,029, an average of \$287 53 per man. This low average is in a measure attributable to the excess of low-priced labor and the bad season, which caused many boats to lay up early.

The gross earnings reached \$4,168,989, showing 127.9 per cent. on the capital invested, and corresponding favorably with the earnings on the upper rivers.

The passenger traffic, showing a movement of 1,385,357 persons, may be divided into 212,417 regular passengers and 1,172,940 ferry transfers for the rivers, and for the total interest concentrated at New Orleans we may add to the above 13,533, representing the ocean passenger traffic in this region, but which is properly classed in the Gulf group. The freight movement was reported at 1,276,972 tons for the rivers alone, and does not include the through freight from the upper rivers, which has already been reported. It must be remembered that this movement is given for the steamers owned on the Lower Mississippi, Arkansas, White, and Red rivers. This comparatively small movement is also exclusive of New Orleans ocean and Gulf movement, amounting to 278,469 tons, and it will also be seen that a large share of the traffic is in cotton, which does not foot up a large aggregate of tonnage, the total direct receipts of which at New Orleans annually would not exceed 375,000 tons. If we look at a cotton carrier buried under its fleecy cargo this will be very apparent. The total receipts and shipments of all classes of freight at New Orleans, excepting ice, stone, lumber, brick, and agricultural machinery, was estimated by Henry G. Hester, of New Orleans, at 2,300,000 tons for the season of 1880. So much has been said about the diversion of the grain movement in this direction that a statement of the grain and flour exports from New Orleans, if taken in connection with what was said in the remarks on Group III, will be of interest. These exports show a material growth since the completion of the jetties and the increase in the barge lines. This movement, however, is not well maintained in seasons of short crops, and a falling off in excess of that at other shipping ports is noted here. The following table prepared by Henry G. Hester, secretary National Cotton Exchange, shows the exports of flour and grain from this city for the past thirty years, both foreign and coastwise:

Year.	TO PORTS OF THE UNITED STATES.		TO FOREIGN PORTS.	
	Flour.	Grain.	Flour.	Grain.
	<i>Barrels.</i>	<i>Bushels.</i>	<i>Barrels.</i>	<i>Bushels.</i>
1850 (5 years).....	1, 276, 185	5, 116, 615	1, 420, 078	4, 486, 799
1855 (5 years).....	2, 270, 851	3, 385, 907	1, 367, 500	6, 471, 902
1860 (5 years).....	314, 921	1, 399, 420	133, 435	387, 760
1865 (5 years).....	1, 221, 018	4, 435, 817	375, 217	1, 265, 398
1870 (5 years).....	327, 444	923, 744	228, 279	168, 746
1871.....	356, 020	753, 544	157, 927	594, 091
1872.....	406, 687	1, 375, 747	78, 893	782, 416
1873.....	416, 906	2, 597, 865	68, 867	1, 119, 070
1874.....	299, 279	1, 757, 440	180, 354	1, 244, 499
1875.....	247, 376	1, 160, 800	94, 876	2, 459, 986
1876.....	237, 228	1, 053, 009	93, 792	1, 675, 492
1877.....	171, 062	1, 049, 630	34, 208	2, 930, 192
1878.....	144, 534	1, 217, 767	38, 042	7, 304, 458
1879.....	83, 344	975, 906	108, 821	5, 795, 127
1880.....	104, 539	657, 806	102, 361	14, 615, 143

The fuel used on the steamers of the lower river, amounting to 184,951 tons of coal and 112,254 cords of wood, indicates the same wasteful practices here as on the upper rivers. The average per ton of custom-house measurement would be increased if all the steamers laid up were not included in the tonnage. The wood used is mostly cottonwood, and of little value as fuel.

## STEAM NAVIGATION IN THE UNITED STATES.

## GROUP VII.—SUMMARY—GULF STATES.

(See Chapter III, Table V.)

On the Gulf coast, including the ocean interests of New Orleans and the rivers of Texas, Alabama, and western Florida, there were owned 126 steamers, measuring 41,610.67 tons, and valued at \$3,272,800. There were employed on these steamers 1,919 persons, to whom were paid \$1,016,800, or an average of \$529 85 per annum. This high average is owing to the long season and the fact that a large portion of the service was on ocean steamers, where skilled labor is required. The earnings, amounting to \$2,806,310, equaled 85.7 per cent. on the capital invested. In Texas, however, business was interfered with by the hurricane of August 12, 1880, which did much damage to steamboat property, quite a number of steamers being lost. There was in this group a movement of 79,260 passengers and 694,343 tons of freight, a large share of which was moved by the ocean lines out of New Orleans, including Morgan's lines and the Tampa Steamship Company's lines.

## GROUP VIII.—SUMMARY—SOUTH ATLANTIC COAST.

(See Chapter III, Table V.)

Along the coast south of Norfolk to Fernandina and on the rivers of Virginia, North and South Carolina, Georgia, and eastern Florida, there were 266 steamers enumerated. They measured 30,833.13 tons, and were valued at \$2,515,300. Of these steamers 103 were passenger steamers, 8 were ferry steamers, 23 were freight steamers, 89 towing steamers, 15 fishing steamers, and 28 yachts. The capital invested reached \$3,135,100, and the steamers gave employment to 1,886 persons, to whom \$845,251 were paid, or an average of \$448 17 per annum.

The passenger movement of 1,787,065 persons carried may be divided into 166,229 regular passengers and 1,620,836 ferry transfers, the latter item including the transfer of 1,502,400 passengers by the Norfolk ferries. The freight traffic was reported at 553,222 tons, and included 104,255 tons moved by the ocean lines of Savannah and Charleston.

## GROUP IX.—SUMMARY—PACIFIC COAST.

(See Chapter III, Table V.)

There were 319 steamers owned on the Pacific coast in 1880. Of these steamers 178 were owned in California, 89 in Oregon, and 52 in Washington territory.

They measured 97,004.88 tons, and were valued at \$6,477,500, averaging 304.09 tons apiece, with an average value of \$20,306.

The capital invested in these steamers, exclusive of dock property, was \$8,854,490, and they gave employment to 3,008 men.

Gross earnings here were \$6,362,770, or 71.9 per cent. on the capital invested. Excepting in the case of a few of the large and well-established lines, money was lost in the competition with the railroads, and there has been a gradual withdrawal of lines for several years past in consequence of this competition. The amount paid for service here was \$1,953,451, or an average of 649.41 per annum for each employé. The passenger movement was 6,604,712, of which 300,752 were regular passengers, and 6,303,960 were ferry passengers. The freight movement was reported at 2,087,293 tons, of which 249,583 tons were carried by ocean steamers, 838,019 tons by inland passenger steamers, 240,298 tons by freight steamers, and 759,393 tons by ferry steamers.

The fuel consumed in this group, amounting to 146,407 tons of coal and 103,446 cords of wood, shows an average of 1.50 tons of coal to the ton of measurement and 1.06 cords of wood.

## GROUP X.—SUMMARY—UPPER MISSOURI RIVER.

(See Chapter III, Table V.)

On the Missouri, Platte, and Kansas rivers and the Red River of the North there were enumerated, in 1880, 44 steamers of all descriptions, representing the steamboat property of the state of Nebraska, of western Iowa, and of Dakota territory. The traffic on the Upper Missouri, with headquarters at Yankton and Sioux City, is isolated and independent of the lower river and the Mississippi, so that a grouping of these interests can be made with propriety. These 44 steamers measured 12,099.22 tons, and were valued by experts at \$492,300, with \$563,900 of capital invested.

They gave employment to 661 officers and crew and 386 roustabouts, to whom were paid \$301,468, making an average of \$287 93 per man for a short season, not exceeding an average of seven months of the year.

Gross earnings, amounting to \$826,396, were reported, showing 146.5 per cent. on the capital invested.

The passengers carried were 81,359, exclusive of railway transfers, and may be divided into 13,359 regular passengers and 68,000 ferry passengers.

The freight movement, mostly confined to the upper Missouri trade, reached 65,303 tons, exclusive of 162,414 tons of railway transfers. Very little coal is used here, but the wood averaged 4.38 cords to the ton of measurement engaged.

The following table shows the wages and service of a 500-ton steamer on these waters:

	Wages per month.	Total per month.		Wages per month.	Total per month.
1 master .....	\$150 00	\$150 00	3 cabin boys .....	\$18 00	\$54 00
1 clerk .....	100 00	100 00	1 chambermaid .....	20 00	20 00
2 pilots .....	150 00	300 00	3 firemen .....	35 00	105 00
1 first engineer .....	100 00	100 00	2 deck hands .....	35 00	70 00
1 second engineer .....	75 00	75 00	20 roustabouts .....	30 00	600 00
1 carpenter .....	70 00	70 00	1 mate .....	100 00	100 00
1 watchman .....	40 00	40 00			
1 steward .....	80 00	80 00	<b>Total</b> .....		<b>1,984 00</b>
1 cook and assistant .....	120 00	120 00			

## CHAPTER III.—STATISTICAL TABLES.

## MERCHANT STEAM MARINE.

The smallest interests shown in the following tables are those of each state in the Union, as given in Table VI. These state interests and parts of states are again combined in certain natural groupings, as shown in Table V, comprising the ten groups as follows: New England States, I; Northern Lakes, II; Upper Mississippi, III; Ohio River, IV; Middle States, V; Lower Mississippi River, VI; Gulf States, VII; Lower Atlantic Coast States, VIII; Pacific Coast, IX; and Upper Missouri River, X. The steamboat interests on the canals in the United States are shown in Table IV and those on the inland lakes in Table III, while Table II shows the interests afloat on the waters of the United States exclusive of canal and inland waters, as shown in Tables III and IV. Table I gives the grand total of all steamboat interests in the merchant service in the United States. Those owned by the government, including the navy, will be found in Chapter IV, Table VIII.

TABLE I.—UNITED STATES INTERESTS—MERCHANT STEAM CRAFT.

Statement of the total number, tonnage, value, capital invested, service, and traffic of the steam craft of the United States for 1880.

Interests.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	EARNINGS.		Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
						Gross earnings.	Percentage on capital.				Coal, in tons.	Wood, in cords.
Grand total .....	5,139	1,221,206.93	<i>Dollars.</i> 80,192,493	<i>Dollars.</i> 112,005,600	<i>a</i> 56,811	<i>b</i> 85,091,067	76.0	<i>c</i> 25,982,803	<i>d</i> 168,463,001	<i>e</i> 25,451,404	<i>f</i> 3,827,993	<i>f</i> 704,775
United States waters ( <i>g</i> ) ..	4,778	1,194,888.98	78,848,325	110,478,080	55,453	83,903,537	75.9	25,568,296	167,683,106	24,819,523	3,782,852	784,785
State waters ( <i>h</i> ) .....	218	9,338.89	680,070	782,320	636	387,326	49.5	132,790	774,395	54,035	11,427	9,771
Canal interests .....	<i>i</i> 143	16,979.06	664,100	745,200	722	800,204	107.3	281,717	5,500	577,846	38,714	219

*a* In addition to the above there were 7,032 roustabouts employed on the western rivers.

*b* Gross earnings equal 76 per cent. on capital invested.

*c* Average wages, \$406.97 per annum, including officers, crews, and roustabouts.

*d* Passengers lost, 197; employes, 106; run down, etc., 17; total, 320.

*e* Includes 867,120 tons freight reported towed by the barge lines of Saint Louis.

*f* Average of coal used, per ton of custom-house measurement, 3.13 tons; wood, 0.65 cord.

*g* Waters with a navigable outlet and subject to customs and inspection laws of the United States.

*h* Waters within states, with no navigable outlet and not subject to customs and inspection laws of the United States.

*i* Including 18 cable-boats, measuring 1,800 tons, on the Erie canal.

TABLE II.—UNITED STATES WATERS—MERCHANT STEAM TONNAGE AND TRAFFIC.

Statement of the total number, tonnage, and traffic of steamers on United States waters.

[Waters with a navigable outlet and subject to customs and inspection laws.]

Interests.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	EARNINGS.		Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
						Gross earnings.	Percentage on capital.				Coal, in tons.	Wood, in cords.
Total .....	<i>a</i> 4,778	1,194,888.98	<i>Dollars.</i> 78,848,325	<i>Dollars.</i> 110,478,080	55,453	<i>Dollars.</i> 83,903,537	75.9	<i>c</i> 25,568,296	<i>d</i> 167,683,106	24,819,523	<i>e</i> 3,782,852	<i>e</i> 784,785
GROUP I. New England states .....	463	118,553.74	7,890,550	13,743,200	5,645	7,849,823	57.1	2,607,135	15,474,710	2,610,416	375,080	8,568
GROUP II. Northern lakes .....	947	222,290.45	13,918,925	16,978,108	9,143	12,180,228	71.4	3,293,964	1,356,010	4,368,171	488,610	255,629
GROUP III. Upper Mississippi river .....	366	83,918.09	3,004,050	6,086,760	4,874	7,668,864	125.0	2,204,644	1,299,553	<i>f</i> 3,500,085	525,331	93,318
GROUP IV. Ohio river .....	478	107,472.48	5,661,500	6,051,522	7,090	7,628,924	126.0	2,847,085	3,961,798	2,446,353	676,347	16,474

*a* Exclusive of canal interests of New York (city), New Jersey, and Pennsylvania. See Group V.

*b* In addition to the above there were 7,032 roustabouts employed on the western rivers.

*c* Average wages, \$409.19 per annum, including officers, crews, and roustabouts.

*d* Passengers lost, 197; employes, 106; run down, etc., 17; total, 320.

*e* Average of coal used, per ton of custom-house measurement, 3.13 tons; wood, 0.65 cord.

*f* Includes 867,120 tons freight reported towed by the barge lines of Saint Louis.

Statement of the total number, tonnage, and traffic of steamers on United States waters—Continued.

Interests.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	EARNINGS.		Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
						Gross earnings.	Percentage on capital.				Coal, in tons.	Wood, in cords.
<b>GROUP V.</b>			<i>Dollars.</i>	<i>Dollars.</i>		<i>Dollars.</i>		<i>Dollars.</i>	<i>Number.</i>			
Middle states .....	1,459	432,803.26	32,763,850	48,091,084	17,268	81,856,519	66.2	8,812,469	135,653,282	7,217,415	1,272,857	12,642
<b>GROUP VI.</b>												
Lower Mississippi river....	315	48,303.06	2,851,550	3,260,450	3,959	4,168,989	127.8	1,026,029	1,385,337	1,270,972	184,951	112,254
<b>GROUP VII.</b>												
Gulf of Mexico.....	126	41,610.67	3,272,800	3,713,466	1,919	2,806,310	75.5	1,016,800	79,260	694,343	41,993	62,556
<b>GROUP VIII.</b>												
South Atlantic coast .....	206	30,833.13	2,515,300	3,135,100	1,886	2,598,709	82.8	845,251	1,787,065	553,222	64,995	66,835
<b>GROUP IX.</b>												
Pacific coast .....	319	97,004.88	6,477,500	8,854,400	3,008	6,362,770	71.8	1,953,451	6,604,712	2,087,293	146,407	103,446
<b>GROUP X.</b>												
Upper Missouri river .....	44	12,099.22	492,300	563,900	661	826,396	146.5	301,468	81,359	65,303	6,281	53,063

TABLE III.—STATE WATERS.

Statement of the total number, tonnage, value, capital invested, service, and traffic of the merchant steam craft of the United States employed on state waters.

[Waters within states with no navigable outlet, and not subject to customs laws.]

States.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	EARNINGS.		Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
						Gross earnings.	Percentage on capital.				Coal, in tons.	Wood, in cords.
<b>Total .....</b>	<b>218</b>	<b>9,338.80</b>	<i>Dollars.</i> <b>680,070</b>	<i>Dollars.</i> <b>782,320</b>	<b>636</b>	<i>Dollars.</i> <b>387,326</b>		<i>Dollars.</i> <b>a 132,790</b>	<i>Number.</i> <b>774,395</b>	<b>54,035</b>	<b>b 11,427</b>	<b>b 9,771</b>
Maine .....	25	647.30	37,400	87,150	100	27,615		8,898	18,266	6,712	5	2,168
New Hampshire .....	18	931.79	92,300	92,400	61	30,592		12,244	43,729	7,908	12	1,783
Vermont .....	2	13.00	9,000	9,000	8	4,500		760	4,000	3,500		700
Massachusetts .....	7	32.00	8,900	11,600	13	6,250		1,455	37,575		80	12
New York .....	80	5,264.00	265,600	294,300	232	118,706		42,776	313,325	9,315	8,470	1,278
Pennsylvania .....	12	209.19	32,500	52,500	35	58,340		9,371	178,490		1,064	8
Michigan .....	25	635.57	42,000	42,000	36	37,533		14,491	13,310	11,050	143	1,865
Wisconsin .....	24	613.40	81,700	81,700	59	25,800		11,875	89,000		450	605
Minnesota .....	12	743.00	76,770	77,770	68	67,400		24,300	60,750	6,750	1,160	1,109
Iowa .....	4	48.00	4,300	4,300	7	1,650		200	8,000		43	43
California .....	9	201.64	29,600	29,600	17	8,940		6,000	7,950	8,800		200

a Average wages, \$208 78 per annum.

b Average of coal used, per ton of measurement, 1.22 tons; wood, 1.04 cords.

TABLE IV.—CANAL INTERESTS.

Statement of the number, tonnage, etc., of steam craft employed on canals of the United States.

States.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	EARNINGS.		Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
						Gross earnings.	Percentage on capital.				Coal, in tons.	Wood, in cords.
<b>Total .....</b>	<b>143</b>	<b>16,979.06</b>	<i>Dollars.</i> <b>604,100</b>	<i>Dollars.</i> <b>745,200</b>	<b>722</b>	<i>Dollars.</i> <b>800,204</b>		<i>Dollars.</i> <b>281,717</b>	<i>Number.</i> <b>5,500</b>	<b>577,846</b>	<b>33,714</b>	<b>219</b>
New York, west (a).....	36	4,042.73	121,800	124,800	139	68,130		23,595	5,500	56,946	2,399	48
Illinois (a) .....	26	2,567.24	122,500	134,700	121	293,826		61,414		310,420	10,230	
New York, city (b).....	34	3,828.35	206,000	206,000	167	131,161		109,150		20,800	9,923	
New Jersey (b) .....	12	1,876.93	59,000	65,000	104	160,926		43,715		111,200	4,655	52
Pennsylvania, east (b).....	24	3,533.81	139,000	198,300	158	146,161		43,843		78,980	6,507	119
Maryland (c).....	11	1,130.00	15,800	15,800	33							

a The canal interests of Illinois and New York (west) cannot be properly classed in Group II.

b The canal interests of New York (city), New Jersey, and Pennsylvania (east) can properly be classed in Group V.

c No traffic reported. Labor troubles in the Cumberland region interfered with traffic on the Chesapeake and Ohio canal in 1880.

## STEAM NAVIGATION IN THE UNITED STATES.

TABLE V.—GROUP INTERESTS.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft on United States waters, by groups: 1880.

## GROUP I.—NEW ENGLAND STATES.

States.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total	463	118,553.74	Dollars. 7,890,550	Dollars. 13,743,200	5,645	Dollars. 7,849,828	Dollars. 2,667,135	Number. 15,474,710	2,610,416	b 375,080	b 8,508
Maine	87	16,344.36	1,098,300	1,903,100	724	892,678	339,674	530,282	301,862	42,009	1,776
New Hampshire	7	267.79	30,600	35,200	24	20,980	7,360	11,500	-----	630	15
Vermont	10	2,246.26	212,300	217,250	102	103,214	32,045	92,492	2,580	4,150	1,203
Massachusetts	173	48,885.68	3,257,500	5,217,250	2,298	3,240,652	952,703	13,035,790	694,079	131,414	811
Rhode Island	70	21,486.52	1,539,650	3,245,100	1,055	1,485,952	586,760	831,078	410,939	53,195	2,564
Connecticut	116	29,323.13	1,752,200	3,125,300	1,442	2,106,352	748,593	973,563	1,192,006	143,682	2,109

a Average wages, \$472.47 per annum.

b Average of coal used, per ton of custom-house measurement, 3.16 tons; wood, 0.07 cord.

## GROUP II.—NORTHERN LAKES.

Total	947	222,290.45	13,918,925	16,978,108	9,143	12,136,228	a 3,293,964	1,356,010	4,368,171	b 488,610	b 255,629
Michigan	397	66,457.85	4,508,725	5,972,903	3,263	4,316,423	1,281,256	804,454	929,120	197,886	172,176
Wisconsin (east)	114	12,977.00	769,500	1,093,650	665	723,884	270,741	116,983	382,100	27,963	34,803
Illinois (east)	c 89	13,468.11	847,800	1,207,435	787	950,140	315,115	160,743	250,762	34,973	34,267
Ohio (north)	117	38,353.27	2,124,700	3,089,400	868	1,648,596	379,601	35,826	782,882	79,411	3,408
Pennsylvania (Erie)	26	24,969.33	1,630,100	1,956,700	1,646	1,219,816	352,963	32,160	478,780	32,507	-----
New York (west)	d 204	66,064.89	4,038,100	3,658,020	1,914	3,277,355	694,288	199,835	1,546,527	115,790	10,975

a Average wages, \$360.27 per annum.

b Average of coal used, per ton of custom-house measurement, 2.19 tons; wood, 1.15 cords.

c Exclusive of canal interests, 26 steamers, measuring 2,567.24 tons, valued at \$122,500; capital invested, \$134,700; crew, 121; earnings, \$293,826; services, \$61,414; freight traffic, 310,420 tons; coal used, 10,230 tons.

d Exclusive of canal interests, 36 steamers, measuring 4,042.73 tons, valued at \$121,800; capital invested, \$124,800; crew, 139; earnings, \$68,130; services, \$22,595; passenger traffic, 5,500; freight traffic, 56,946 tons; coal used, 2,399 tons; wood, 48 cords.

## GROUP III.—UPPER MISSISSIPPI RIVER.

Total	366	83,918.09	3,004,050	6,086,760	a 4,874	7,668,804	b 2,204,644	1,299,553	c 3,500,035	d 525,331	d 93,318
Minnesota	49	4,375.52	196,500	284,252	501	427,254	166,199	63,054	14,027	8,312	28,331
Iowa (east)	55	6,490.66	283,050	1,238,374	665	638,894	230,462	141,590	305,476	45,300	14,128
Wisconsin (west)	39	5,658.64	169,200	204,500	536	453,807	205,385	48,921	54,318	14,875	20,806
Illinois (west)	56	6,510.77	256,500	540,050	457	587,960	179,223	403,685	569,399	57,185	4,878
Missouri	167	60,873.50	2,098,800	3,819,584	2,733	5,560,940	1,423,375	642,303	c 2,556,815	399,659	25,085

a In addition to above there were 2,950 roustabouts employed.

b Average wages, \$281.77 per annum, including officers, crews, and roustabouts.

c Includes 867,120 tons reported by the barge lines of Saint Louis.

d Average of coal used, per ton of custom-house measurement, 6.26 tons; wood, 1.11 cords.

## GROUP IV.—OHIO RIVER.

Total	473	107,472.48	5,661,500	6,051,522	a 7,090	7,628,924	b 2,847,035	3,961,798	2,446,353	c 676,347	c 16,474
Pennsylvania (Pittsburgh)	151	33,802.12	2,161,400	2,258,050	2,209	2,764,445	1,092,595	184,742	299,855	278,746	250
West Virginia	61	7,497.34	312,000	426,600	613	376,877	163,671	179,785	121,308	39,401	495
Ohio (river)	119	35,171.33	1,488,000	1,505,422	2,232	2,349,938	824,325	764,991	552,190	168,783	5,299
Kentucky	91	23,256.89	1,300,500	1,415,950	1,448	1,472,772	561,261	2,626,686	676,428	161,731	7,633
Indiana	51	7,744.80	399,000	445,500	588	664,892	205,233	205,504	796,572	27,686	2,797

a In addition to the above there were 2,000 roustabouts employed.

b Average wages, \$313.21 per annum, including officers, crews, and roustabouts.

c Average of coal used, per ton of custom-house measurement, 6.29 tons; wood, 0.15 cord.

STATISTICAL TABLES.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

GROUP V.—MIDDLE STATES.

States.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total .....	<i>a</i> 1,459	432,803.26	<i>Dollars.</i> 32,763,850	<i>Dollars.</i> 48,091,084	17,268	<i>Dollars.</i> 31,856,519	<i>Dollars.</i> 68,812,469	135,653,282	7,217,415	<i>c</i> 1,272,857	<i>c</i> 12,642
New York (east) .....	<i>d</i> 876	279,244.53	21,077,150	33,535,081	11,028	22,357,754	5,858,091	93,370,484	3,270,830	799,553	7,194
New Jersey .....	163	41,811.17	2,402,150	2,943,450	1,271	2,615,793	838,001	39,991,653	1,060,231	109,030	1,884
Pennsylvania (east) .....	203	54,086.66	4,516,300	5,671,243	1,982	3,366,763	938,563	1,227,714	1,065,732	210,357	820
Delaware .....	25	5,877.97	302,300	497,800	229	139,993	55,289	67,500	152,760	8,461	1,740
Maryland .....	158	44,837.16	3,870,950	4,609,950	2,521	3,075,640	1,038,825	908,832	995,353	124,717	870
District of Columbia .....	34	6,945.77	595,000	832,960	237	300,576	83,190	87,000	63,500	20,730	125

*a* Exclusive of canal interests.  
*b* Average wages, \$510 33 per annum.  
*c* Average of coal used, per ton of custom-house measurement, 2.04 tons; wood, 0.63 cord.  
*d* Including 18 cable-boats, measuring 1,800 tons, on the Erie canal.

GROUP VI.—LOWER MISSISSIPPI RIVER.

Total .....	315	48,303.06	2,851,550	3,260,450	<i>a</i> 3,959	4,168,980	<i>b</i> 1,629,029	1,985,357	1,276,972	<i>c</i> 184,951	<i>c</i> 112,254
Tennessee .....	61	11,348.40	589,000	708,500	976	1,035,196	329,329	70,293	399,565	75,110	27,573
Arkansas .....	37	5,046.75	227,400	270,300	480	389,671	146,356	57,979	82,635	2,835	31,096
Mississippi .....	40	3,057.20	204,450	242,150	443	300,140	238,931	33,131	93,364	5,704	10,813
Louisiana .....	<i>d</i> 177	28,250.71	1,830,700	2,030,500	2,060	2,443,973	911,413	1,218,044	701,408	101,242	42,772

*a* Add 1,096 roustabouts to above.  
*b* Average wages, \$287 53 per annum.  
*c* Average of coal used, per ton of custom-house measurement, 3.82 tons; wood, 2.32 cords.  
*d* Exclusive of New Orleans ocean interests.

GROUP VII.—GULF OF MEXICO.

Total .....	126	41,610.67	3,272,800	3,713,466	1,919	2,806,310	<i>a</i> 1,016,890	70,260	694,343	<i>b</i> 41,993	<i>b</i> 62,556
Texas .....	35	4,351.01	196,900	345,466	350	336,456	164,951	4,803	168,422	3,097	11,112
Louisiana .....	<i>c</i> 18	25,421.68	2,555,000	2,600,000	514	1,654,843	506,405	13,533	278,469	28,144	.....
Alabama .....	43	7,168.17	257,600	421,700	702	437,465	251,220	51,237	184,187	240	38,528
Florida (west) .....	30	4,668.91	263,300	340,300	353	377,540	94,224	9,687	63,265	9,912	12,916

*a* Average wages, \$529 85 per annum.  
*b* Average of coal used, per ton of custom-house measurement, 1.00 ton; wood, 1.50 cords.  
*c* Ocean steamship interests of New Orleans.

GROUP VIII.—SOUTH ATLANTIC COAST.

Total .....	266	30,833.13	2,515,300	3,135,100	1,886	2,598,790	<i>a</i> 845,251	1,787,065	553,222	<i>b</i> 64,905	<i>b</i> 60,835
Virginia .....	89	6,251.02	494,400	526,350	491	567,793	187,661	1,556,609	139,048	29,904	3,021
North Carolina .....	52	3,850.86	205,700	231,900	335	419,964	110,335	29,421	189,219	5,030	14,509
South Carolina .....	41	5,242.10	242,700	397,850	332	386,260	150,936	135,604	97,204	7,880	10,657
Georgia .....	44	13,331.46	1,387,300	1,686,500	494	1,091,430	325,157	34,701	114,030	22,045	15,831
Florida (east) .....	40	2,157.69	185,200	292,500	234	133,262	71,162	30,730	13,661	127	13,157

*a* Average wages, \$448 17 per annum, including officers and crews.  
*b* Average of coal used, per ton of custom-house measurement, 2.10 tons; wood, 2.16 cords.

GROUP IX.—PACIFIC COAST.

Total .....	319	97,004.88	6,477,500	8,854,490	3,008	6,362,770	<i>a</i> 1,953,451	6,604,712	2,087,293	<i>b</i> 146,407	<i>b</i> 103,440
California .....	<i>c</i> 178	58,828.80	3,763,200	5,916,836	1,970	4,011,084	1,158,200	6,309,502	1,501,256	137,349	14,123
Oregon .....	89	31,370.94	2,177,000	2,394,754	788	1,983,703	602,576	150,993	476,898	8,233	22,889
Washington .....	52	6,805.14	537,300	542,900	250	367,983	192,675	135,307	49,139	825	66,434

*a* Average wages, \$649 41 per annum, including officers and crews.  
*b* Average of coal used, per ton of custom-house measurement, 1.50 tons; wood, 1.06 cords.  
*c* Exclusive of Pacific Mail interests owned in New York.  
*d* Exclusive of dock, railroad, telegraph, and landed property of the Oregon Railway and Navigation Company.

## STEAM NAVIGATION IN THE UNITED STATES.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

## GROUP X.—UPPER MISSOURI RIVER.

States.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total .....	44	12,099.22	Dollars. 492,300	Dollars. 563,900	a 661	Dollars. 826,396	Dollars. b 301,468	Number. 81,359	65,303	c 6,281	c 53,068
Nebraska .....	14	1,193.52	64,300	87,900	63	55,304	29,775	d 68,000	e 8,520	3,986	1,365
Dakota .....	19	7,591.67	328,000	382,000	392	450,955	152,979	8,114	38,686	295	31,394
Iowa (west) .....	11	3,314.03	100,000	f 94,000	206	320,137	118,714	g 5,245	g 18,097	2,000	20,304

a In addition to the above there were 386 roustabouts employed.

b Average wages, \$287.93 per annum, including officers, crews, and roustabouts.

c Average of coal used, per ton of custom-house measurement, 0.51 ton; wood, 4.38 cords.

d Exclusive of railroad transfers, 20,306 passengers.

e Exclusive of 311,660 tons railroad transfer freight.

f Original investment; boats built between 1870 and 1878, when labor and material were cheap.

g Exclusive of railroad transfers, 7,178 passengers and 162,414 tons of freight.

## TABLE VI.—STATE INTERESTS.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, by states: 1880.

## MAINE.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Grand total .....	112	16,991.66	Dollars. 1,135,700	Dollars. a 1,990,250	824	Dollars. 920,293	Dollars. b 343,572	Number. 548,548	308,574	c 42,014	c 3,944
UNITED STATES WATERS.											
Passenger .....	40	14,079.51	888,500	1,468,500	556	838,458	305,802	319,918	239,498	32,557	723
Ferry .....	6	555.28	31,100	35,200	14	13,914	9,560	209,704	62,364	695	44
Towing .....	28	1,310.49	150,200	363,600	118	34,786	18,652	.....	.....	8,070	1,000
Fishing .....	6	326.15	20,000	22,000	22	6,545	3,630	.....	.....	583	4
Yachts .....	7	72.98	8,500	13,800	14	3,975	2,030	660	.....	104	5
Total .....	87	16,944.36	1,098,300	1,903,100	724	892,678	339,674	539,282	301,862	42,009	1,776
STATE WATERS.											
Passenger .....	25	647.30	37,400	87,150	100	27,615	8,898	18,266	6,712	5	2,108
Total .....	25	647.30	37,400	87,150	100	27,615	8,898	18,266	6,712	5	2,108

a In 19 leading lines: amount invested, \$1,555,000; number of boats, 41; tonnage, 13,195.24; length of routes, 1,644 miles.

b Average wages, \$423.02 per annum.

c Average of coal used, per ton of custom-house measurement, 2.47 tons; wood, 0.23 cord.

## NEW HAMPSHIRE.

Grand total .....	25	1,199.58	122,900	a 127,600	85	51,572	b 19,604	55,229	7,908	c 642	c 1,798
UNITED STATES WATERS.											
Passenger .....	2	179.20	22,000	22,000	9	9,480	2,800	7,600	.....	280	7
Towing .....	2	77.59	6,500	9,000	8	9,300	3,700	.....	.....	310	5
Yachts .....	3	11.00	2,100	4,200	7	1,700	860	3,900	.....	40	3
Total .....	7	267.79	30,600	35,200	24	20,980	7,360	11,500	.....	630	15
STATE WATERS.											
Passenger .....	9	901.79	85,200	85,200	44	29,092	11,159	37,729	6,708	9	1,655
Yachts .....	9	30.00	7,100	7,200	17	1,500	1,085	6,000	1,200	3	128
Total .....	18	931.79	92,300	92,400	61	30,592	12,244	43,729	7,908	12	1,783

a In 3 leading lines: amount invested, \$76,000; number of boats, 5; tonnage, 647.15; length of routes, 70 miles.

b Average wages, \$230.63 per annum.

c Average of coal used, per ton of custom-house measurement, 0.53 ton; wood, 1.49 cords.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

VERMONT.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Grand total .....	12	2,250.26	Dollars. 221,300	Dollars. a 226,250	110	Dollars. 107,714	Dollars. b 32,805	Number. 96,492	6,030	c 4,150	c 1,903
UNITED STATES WATERS.											
Passenger .....	5	2,172.39	201,000	206,000	89	95,544	28,962	86,266	2,200	3,730	1,200
Yachts .....	5	78.87	11,300	11,250	13	7,670	3,083	6,226	330	420	3
Total .....	10	2,246.26	212,300	217,250	102	103,214	32,045	92,492	2,530	4,150	1,203
STATE WATERS.											
Passenger .....	2	13.00	9,000	9,000	8	4,500	760	4,000	8,500	.....	700
Total .....	2	13.00	9,000	9,000	8	4,500	760	4,000	3,500	.....	700

a In four leading lines: amount invested, \$211,000; number of boats, 6; tonnage, 2,156.77; length of routes, 188 miles.  
 b Average wages, \$298.22 per annum.  
 c Average of coal used, per ton of custom-house measurement, 1.83 tons; wood, 0.84 cord.

MASSACHUSETTS.

Grand total .....	180	48,017.68	3,260,400	a 5,228,850	2,311	3,240,002	b 954,158	13,073,365	694,079	c 131,404	c 823
UNITED STATES WATERS.											
Passenger, ocean .....	11	12,017.10	583,000	931,000	344	732,098	221,444	9,094	320,844	24,874	130
Passenger, inland .....	47	20,538.73	1,857,500	2,725,500	1,188	1,703,782	406,675	1,764,761	271,062	69,574	342
Ferry .....	13	5,040.55	268,000	772,000	81	281,026	122,450	11,261,035	(d)	8,552	41
Freight .....	9	1,262.28	41,700	63,200	142	188,380	43,487	.....	93,173	8,676	22
Towing .....	48	2,192.29	249,100	453,200	284	206,562	96,007	.....	.....	16,086	108
Yachts .....	30	315.02	63,600	71,450	89	e 7,540	11,480	.....	.....	632	73
Fishing .....	11	1,458.25	187,500	190,000	166	105,000	43,300	.....	.....	1,900	70
Water .....	4	55.46	7,100	10,900	14	15,064	7,800	.....	.....	400	16
Total .....	173	48,885.68	3,257,500	5,217,250	2,298	3,240,652	952,703	13,035,700	694,079	131,414	811
STATE WATERS.											
Yachts .....	7	32.00	8,900	11,600	13	6,250	1,455	37,575	.....	80	12
Total .....	7	32.00	8,900	11,600	13	6,250	1,455	37,575	.....	80	12

a In 11 leading lines: amount invested, \$3,475,872; number of boats, 35; tonnage, 24,118.12; length of routes, 2,513 miles.  
 b Average wages, \$412.87 per annum.  
 c Average of coal used, per ton of custom-house measurement, 2.68 tons; wood, 0.02 cord.  
 d Teams, carriages, carts, and horses reported by the ferries of Boston, 852,367.  
 e Earned by towing.

RHODE ISLAND.

Total .....	70	21,486.52	1,539,650	a 3,245,100	1,055	1,485,952	b 536,760	c 831,078	419,939	d 53,195	d 2,564
Passenger .....	21	14,777.11	1,207,800	2,802,300	617	790,531	315,165	796,078	250,080	28,231	980
Ferry .....	1	115.06	12,000	13,000	4	5,854	2,280	35,000	3,000	305	2
Towing .....	5	185.04	19,500	19,500	22	67,467	19,786	.....	.....	2,100	43
Freight .....	7	4,784.94	111,500	190,500	168	429,544	170,892	.....	166,859	16,469	595
Fishing .....	19	1,440.13	146,500	175,500	229	192,556	65,287	.....	.....	5,962	932
Yachts .....	e 17	184.24	42,350	44,300	15	.....	4,350	.....	.....	68	3

a In 6 leading lines: amount invested \$2,942,100; number of boats, 21; tonnage, 19,696.37; length of routes, 300 miles.  
 b Average wages, \$556.17 per annum.  
 c Twenty-seven passengers and 1 employé lost.  
 d Average of coal used, per ton of custom-house measurement, 2.47 tons; wood, 0.12 cord.  
 e Five only in service.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

## CONNECTICUT.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total .....	116	20,323.13	Dollars. 1,752,200	Dollars. a 3,125,300	1,442	Dollars. 2,106,352	Dollars. b 748,593	Number. c 973,568	1,192,006	d 143,682	e 2,199
Passenger .....	36	17,994.77	1,004,200	2,057,900	804	1,245,450	424,586	450,018	559,352	65,520	1,850
Ferry .....	11	4,140.14	241,600	305,900	88	176,505	40,234	523,250	337,396	7,657	34
Towing .....	21	838.55	99,500	194,500	141	169,289	56,904	.....	.....	47,396	82
Freight .....	12	4,487.65	217,000	332,500	191	426,346	171,939	.....	295,258	16,751	69
Fishing .....	26	1,746.14	176,600	220,000	187	88,502	54,235	.....	.....	6,240	145
Yachts .....	e 10	115.88	13,300	14,500	31	200	695	300	.....	118	10

a In 17 leading lines: amount invested, \$2,379,841; number of boats, 41; c One employé lost.

tonnage, 21,629.58; length of routes, 1,308 miles.

d Average of coal used, per ton of custom-house measurement, 4.89 tons; wood, 0.07 cord.

b Average wages, \$519 13 per annum.

e Four only in service.

## MICHIGAN.

Grand total .....	a 422	67,093.42	4,550,725	b 6,014,903	3,299	4,353,961	c 1,295,747	d 817,764	940,170	e 198,029	e 174,041
UNITED STATES WATERS.											
Passenger .....	64	23,110.80	1,419,900	1,644,697	1,102	1,242,183	373,717	471,384	374,916	54,071	71,109
Ferry .....	18	2,962.43	290,700	347,300	88	72,412	41,308	280,728	3,850	6,881	4,568
Freight .....	68	27,898.15	1,712,000	2,388,565	892	1,621,769	431,776	.....	544,343	66,881	25,406
Towing .....	176	11,194.72	966,200	1,496,366	961	1,234,306	371,544	.....	.....	67,505	61,923
Yachts .....	71	1,291.75	110,925	155,975	220	115,758	62,911	52,342	6,011	2,548	9,080
Total .....	397	66,457.85	4,508,725	5,972,903	3,263	4,316,428	1,281,256	804,454	929,120	197,886	172,176
STATE WATERS.											
Passenger .....	12	451.00	24,900	24,900	25	18,181	7,984	13,310	11,050	.....	1,535
Yachts .....	5	25.00	4,200	4,200	.....	.....	.....	.....	.....	.....	.....
Towing .....	8	159.57	12,900	12,900	11	19,352	6,507	.....	.....	143	330
Total .....	25	635.57	42,000	42,000	36	37,533	14,491	13,310	11,050	143	1,865

a Two steamers, measuring 715.47 tons, not included in the above, were in existence a part of the year 1880, and 8 steamers laid up, measuring 464.93 tons, included in the above.

b In 30 leading lines: amount invested, \$2,480,637; number of boats, 71; tonnage, 27,451.24; length of routes, 10,874 miles.

c Average wages, \$392 76 per annum.

d Eighty-six passengers and 5 employés lost.

e Average of coal used, per ton of custom-house measurement, 2.95 tons; wood, 2.50 cords.

## WISCONSIN.

Grand total .....	a 177	19,249.04	1,020,400	b 1,379,850	1,260	1,203,491	c 488,001	254,904	436,418	d 43,308	e 56,304
UNITED STATES WATERS.											
Lakes.											
Passenger .....	21	1,329.04	84,900	82,650	113	72,505	21,008	53,071	28,991	216	9,504
Ferry .....	2	46.93	4,000	4,000	8	12,000	3,000	02,812	.....	600	.....
Freight .....	23	9,069.51	426,300	545,900	226	359,844	120,029	.....	352,959	15,027	6,084
Towing .....	55	2,303.38	223,900	425,550	272	242,004	107,754	.....	.....	8,778	18,860
Yachts .....	13	227.54	30,400	35,550	46	37,531	18,350	1,100	150	3,362	355
Total .....	114	12,977.00	769,500	1,093,650	665	723,884	270,741	116,983	382,100	27,983	34,803
River.											
Passenger .....	12	2,763.34	75,700	97,786	245	144,989	50,672	26,021	54,318	3,805	4,132
Ferry .....	4	147.61	5,600	15,800	13	6,210	4,300	22,900	.....	.....	1,480
Towing .....	23	2,747.69	87,900	90,914	278	302,608	150,413	.....	.....	11,079	15,284
Total .....	39	5,658.64	169,200	204,500	e 536	453,807	205,385	48,921	54,318	14,875	20,806
STATE WATERS.											
Passenger .....	12	459.00	46,500	46,500	39	22,800	6,555	89,000	.....	365	325
Yachts .....	12	154.40	35,200	35,200	20	3,000	5,320	.....	.....	85	280
Total .....	24	613.40	81,700	81,700	59	25,800	11,875	89,000	.....	450	605

a Four steamers, measuring 229.32 tons, laid up, included in the above.

b In 10 leading lines: amount invested, \$644,500; number of steamers, 27; tonnage, 11,084.02; length of route, 3,240 miles.

c Average wages, \$327 29 per annum.

d Average of coal used, per ton of custom-house measurement, 2.24 tons; wood, 2.92 cords.

e In addition to the above there were 231 roustabouts employed on the rivers.

STATISTICAL TABLES.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

ILLINOIS.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
			Dollars.	Dollars.		Dollars.	Dollars.	Number.			
Grand total.....	a 171	22,546.12	1,226,800	b 1,882,185	1,347	1,831,935	c 555,752	570,428	1,130,851	d 102,388	d 30,145
<b>LAKE.</b>											
Passenger.....	13	9,180.50	457,000	800,000	405	360,855	113,936	74,871	212,066	7,878	23,027
Freight.....	10	2,486.05	111,500	122,500	125	196,638	61,683	.....	38,096	3,631	7,940
Towing.....	51	1,559.89	244,400	245,400	228	971,158	133,506	.....	.....	22,934	2,400
Yachts.....	15	241.67	34,900	39,535	29	12,498	5,990	92,372	.....	530	.....
Canal.....	26	2,567.24	122,500	134,700	121	293,826	61,414	.....	310,420	10,230	.....
Total.....	115	16,035.35	970,300	1,342,135	908	1,243,975	376,529	166,743	561,182	45,203	34,267
<b>RIVER.</b>											
Passenger.....	12	2,203.81	59,600	106,600	167	183,442	60,428	49,450	114,734	16,323	1,466
Ferry.....	23	2,925.99	122,500	344,700	110	270,294	55,317	354,235	454,665	27,807	1,581
Towing.....	21	1,380.07	74,400	88,750	162	134,224	63,478	.....	.....	13,050	1,831
Total.....	56	6,510.77	256,500	540,050	e 439	587,960	179,223	f 403,685	569,399	57,185	4,878

a Three steamers laid up, measuring 95.10 tons, included in the above.  
 b In 7 leading lines: amount invested, \$932,000; number of boats, 21; tonnage, 12,860.20; length of routes, 2,449 miles.  
 c Average wages, \$393.59 per annum.  
 d Average of coal used, per ton of custom-house measurement, 4.54 tons; wood, 1.73 cords.  
 e In addition to the above there were 65 roustabouts.  
 f Three persons burned.

OHIO.

Grand total.....	236	73,524.60	3,612,700	a 4,594,822	3,100	3,998,534	b 1,203,926	c 800,817	1,335,072	d 248,194	d 8,707
<b>RIVER.</b>											
Passenger.....	61	29,254.00	1,238,000	1,230,235	1,806	1,892,822	667,105	414,645	549,190	111,312	5,224
Ferry.....	20	1,293.30	50,100	64,062	60	49,726	21,659	350,346	3,000	4,643	.....
Towing.....	32	4,580.79	191,900	202,825	349	407,390	134,121	.....	.....	52,668	75
Yachts.....	6	43.24	8,000	8,900	17	.....	1,440	.....	.....	160	.....
Total.....	e 119	35,171.33	1,488,000	1,505,422	f 2,232	2,349,938	824,325	764,991	552,190	168,783	5,290
<b>LAKE.</b>											
Passenger.....	6	1,067.76	63,000	115,000	40	37,000	10,770	34,526	10,500	2,840	25
Freight.....	47	35,179.15	1,791,000	2,654,800	587	1,343,479	279,009	.....	772,382	56,203	1,916
Towing.....	55	2,004.80	253,700	300,900	223	264,517	86,822	.....	.....	20,018	1,467
Yachts.....	9	101.56	17,000	18,700	18	3,600	3,000	1,300	.....	350	.....
Total.....	g 117	38,353.27	2,124,700	3,089,400	868	1,648,506	379,601	35,826	782,882	79,411	3,408

a In 24 leading passenger and freight lines: capital invested, \$2,875,247; number of boats, 60; tonnage, 44,630.73; length of routes, 15,696 miles.  
 b Average wages, \$337.51 per annum.  
 c Two employes lost.  
 d Average of coal used, per ton of custom-house measurement, 3.37 tons; wood, 0.11 cords.  
 e Laid up on the river, 3 steamers, measuring 344.56 tons, included in the above.  
 f Roustabouts, 467, not included.  
 g Laid up on the lakes, 4 steamers, measuring 343.42 tons, included in the above.

MINNESOTA.

Grand total.....	61	5,118.52	273,270	362,022	569	494,654	a 190,499	b 123,804	20,777	c 9,472	c 29,440
<b>UNITED STATES WATERS.</b>											
Passenger.....	11	998.35	39,200	50,800	102	64,933	26,488	44,730	14,027	578	4,821
Ferry.....	4	245.80	10,500	17,252	17	14,166	6,807	18,324	.....	.....	1,581
Towing.....	34	3,131.37	146,800	216,200	382	348,155	132,904	.....	.....	7,734	21,929
Total.....	49	4,475.52	196,500	284,252	501	427,254	166,199	63,054	14,027	8,812	28,331
<b>STATE WATERS.</b>											
Passenger.....	9	658.00	70,770	71,770	47	31,400	14,300	60,750	6,750	560	443
Towing.....	3	85.00	6,000	6,000	21	36,000	10,000	.....	.....	600	666
Total.....	12	743.00	76,770	77,770	68	67,400	24,300	60,750	6,750	1,160	1,109

a Average wages, \$334.79 per annum.  
 b One passenger and one employe lost.  
 c Average of coal used, per ton of custom-house measurement, 1.85 tons; wood, 5.75 cords.

## STEAM NAVIGATION IN THE UNITED STATES.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

## IOWA.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Grand total .....	<i>a</i> 70	9,861.69	<i>Dollars.</i> 387,350	<i>Dollars.</i> 1,336,674	<i>b</i> 878	<i>Dollars.</i> 960,681	<i>Dollars.</i> e 349,796	<i>Number.</i> 162,013	485,987	<i>d</i> 47,343	<i>d</i> 34,475
Passenger .....	22	5,241.04	166,700	374,000	433	583,499	195,475	39,665	201,190	25,837	25,974
Ferry .....	13	1,612.01	85,700	293,974	70	143,365	47,157	108,898	284,797	4,117	2,275
Towing .....	26	2,931.81	127,800	650,000	352	222,767	104,769	.....	.....	17,116	5,908
Yachts .....	5	28.33	2,850	5,400	16	4,400	1,775	5,450	.....	230	275
Total .....	<i>e</i> 66	9,813.69	383,050	1,332,374	871	959,031	349,176	154,013	485,987	47,300	34,432
STATE WATERS.											
Passenger .....	4	48.00	4,300	4,300	7	1,650	620	8,000	.....	43	43
Total .....	4	48.00	4,300	4,300	7	1,650	620	8,000	.....	43	43

*a* One steamer, measuring 94.26 tons, not included in the above, was in existence a part of the year 1880.*b* In addition to the above there were 467 roustabouts employed.*c* Average wages, \$260 07 per annum.*d* Average of coal used, per ton of custom-house measurement, 4.30 tons; wood, 3.49 cords.*e* Including lines on the Upper Missouri river.

## MISSOURI.

Total .....	<i>a</i> 167	60,873.50	2,098,800	<i>b</i> 3,810,584	<i>c</i> 2,733	5,560,949	<i>d</i> 1,423,375	<i>e</i> 642,303	<i>f</i> 2,556,815	<i>g</i> 399,659	<i>g</i> 25,085
Passenger .....	60	40,728.21	1,166,700	2,007,784	1,760	2,923,415	919,609	181,300	1,003,793	197,644	20,082
Ferry .....	37	6,526.11	310,800	321,050	213	582,159	147,479	461,003	618,152	39,141	2,249
Freight .....	13	3,029.48	47,300	62,600	116	141,908	56,227	.....	67,750	6,245	1,396
Towing .....	46	10,532.73	569,850	1,423,350	625	1,907,817	299,224	.....	867,120	156,582	1,328
Yachts .....	11	56.97	4,150	4,800	19	650	336	.....	.....	47	30

*a* Two steamers included in above, measuring 54.75 tons, were laid up. Six steamers, measuring 2,633.70 tons, not included, were in existence a part of the year 1880.*b* In 12 leading lines: amount invested, \$1,943,000; number of boats, 40; tonnage, 31,492.55; length of routes, 9,228 miles.*c* In addition to above there were 2,330 roustabouts employed.*d* Average wages, \$231 13 per annum, the short season accounting for the low average.*e* One employé lost.*f* Including 867,120 tons reported by the barge line of Saint Louis.*g* Average of coal used, per ton of custom-house measurement, 6.56 tons; wood, 0.45 cord.

## WEST VIRGINIA.

Total .....	<i>a</i> 61	7,497.34	312,600	426,600	<i>b</i> 613	376,877	<i>c</i> 163,671	<i>d</i> 179,785	121,308	<i>e</i> 39,401	<i>e</i> 495
Passenger .....	32	5,291.69	206,600	258,900	430	243,166	99,771	124,215	119,580	21,211	190
Ferry .....	9	480.11	19,100	22,200	23	18,700	9,515	55,570	1,728	2,168	5
Towing .....	20	1,725.54	86,900	145,500	160	115,011	54,385	.....	.....	16,022	300

*a* One steamer, measuring 146.96 tons, laid up, included in the above.*b* In addition to the above there were 256 roustabouts.*c* Average wages, \$188 34 per annum, including officers, crews, and roustabouts.*d* Two employés lost.*e* Average of coal used, per ton of custom-house measurement, 5.25 tons; wood, 0.06 cord.

## KENTUCKY.

Total .....	<i>a</i> 91	23,256.30	1,300,500	1,415,950	<i>b</i> 1,448	1,472,772	<i>c</i> 561,261	<i>d</i> 2,626,686	676,428	<i>e</i> 161,731	<i>e</i> 7,633
Passenger .....	43	18,556.59	1,074,100	1,092,050	1,060	1,101,975	418,782	275,925	552,428	124,896	6,018
Ferry .....	13	1,446.19	49,900	62,200	76	88,500	31,165	2,350,761	124,000	8,469	652
Towing .....	35	3,254.11	176,500	261,700	312	282,297	111,314	.....	.....	28,366	903

*a* One steamer, measuring 246.49 tons, not included in the above, was in existence a part of the year 1880. Five steamers, measuring 1,413.20 tons, included in the above, laid up.*b* In addition to the above there were 517 roustabouts employed.*c* Average wages, \$285 62 per annum, including officers, crews, and roustabouts.*d* Five passengers and two employés lost.*e* Average of coal used, per ton of custom-house measurement, 6.95 tons; wood, 0.32 cord.

STATISTICAL TABLES.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

INDIANA.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total .....	<i>a</i> 51	7,744.80	<i>Dollars.</i> 399,000	<i>Dollars.</i> 445,500	<i>b</i> 588	<i>Dollars.</i> 664,892	<i>Dollars.</i> <i>c</i> 205,233	<i>Numbers.</i> <i>d</i> 205,594	796,572	<i>e</i> 27,686	<i>e</i> 2,797
Passenger .....	24	6,044.94	275,600	311,300	465	560,763	169,004	45,709	790,635	20,203	2,237
Ferry .....	9	817.23	64,000	65,700	42	45,607	12,582	159,885	790,635	3,656	50
Freight .....	4	196.32	3,300	7,300	14	10,011	3,115	.....	5,937	552	50
Towing .....	14	686.31	55,200	61,200	67	48,511	20,532	.....	.....	3,275	510

*a* Three steamers, measuring 97.37 tons, included in the above, were laid up.  
*b* In addition to the above there were 64 roustabouts.  
*c* Average wages, \$314.77 per annum, including officers, crews, and roustabouts.  
*d* Four employes lost.  
*e* Average of coal used, per ton of custom-house measurement, 3.57 tons; wood, 0.36 cord.

NEW YORK.

Grand total .....	<i>a</i> 1,230	358,444.50	25,708,650	37,818,801	13,480	25,953,106	<i>b</i> 6,728,500	<i>c</i> 93,889,144	4,903,927	<i>d</i> 936,135	<i>d</i> 19,495
UNITED STATES WATERS.											
<i>New York city.</i>											
Ocean passenger .....	61	121,060.33	11,041,000	18,105,450	3,428	10,720,321	2,439,699	85,069	1,331,988	262,718	516
Inland passenger .....	97	49,676.97	3,094,000	5,471,900	1,853	2,636,695	648,042	3,304,923	636,433	97,006	4,380
Ferry .....	77	30,291.52	1,701,000	2,720,500	1,135	2,909,962	834,809	87,972,881	.....	100,030	70
Freight .....	49	21,924.07	837,500	1,275,900	660	956,520	373,167	.....	773,200	36,920	173
Towing .....	287	14,176.25	1,579,900	2,252,381	1,747	2,504,186	837,784	.....	.....	155,240	752
Fishing .....	32	2,467.15	235,000	309,500	418	89,094	47,378	.....	.....	9,330	244
Canal .....	<i>e</i> 34	3,828.35	206,000	206,000	167	131,161	109,150	.....	20,300	9,923	.....
Yachts .....	71	1,609.63	260,100	289,700	177	21,697	28,972	33,125	.....	3,266	65
Miscellaneous .....	28	3,830.93	239,000	339,500	251	439,503	193,400	.....	.....	7,196	66
Total .....	736	257,865.20	19,243,500	30,970,831	9,836	20,409,139	5,512,401	91,395,998	2,761,921	690,629	6,266
<i>Northern lakes</i>											
Passenger .....	27	13,074.90	870,000	871,775	429	796,566	149,446	109,115	374,739	26,914	3,631
Ferry .....	8	614.90	36,800	45,000	20	37,852	9,007	86,220	15,050	1,530	1,020
Freight .....	42	48,419.62	2,707,700	2,272,295	971	1,910,890	888,676	.....	1,156,438	59,307	5,839
Towing .....	86	3,127.07	281,000	310,150	397	514,875	128,264	.....	.....	25,931	382
Canal .....	36	4,042.73	121,800	124,800	139	68,130	23,595	5,500	56,946	2,399	48
Yachts .....	41	828.40	142,600	158,800	88	17,172	18,895	4,500	300	2,108	103
Total .....	240	70,107.62	4,159,900	4,378,820	2,053	3,345,485	717,883	205,335	1,603,473	118,189	11,023
<i>Hudson river.</i>											
Inland passenger .....	19	11,344.65	1,022,000	1,117,000	373	662,501	142,927	572,958	529,218	26,115	209
Ferry .....	15	2,486.39	142,000	170,300	68	171,830	47,317	1,362,228	.....	6,472	18
Towing .....	109	11,097.34	825,400	1,429,600	860	1,230,438	257,868	.....	.....	85,445	685
Yachts .....	31	279.30	50,250	53,950	58	15,007	7,328	39,300	.....	815	16
Total .....	174	25,207.68	2,039,650	2,770,850	1,359	2,079,776	455,440	1,974,486	529,218	118,847	928
STATE WATERS:											
Passenger .....	22	4,673.50	177,000	199,000	142	94,278	32,122	242,885	8,164	7,366	1,046
Yachts .....	58	590.50	88,600	95,300	90	24,428	10,654	70,440	1,151	1,104	232
Total .....	80	5,264.00	265,600	294,300	232	118,706	42,776	313,325	9,315	8,470	1,278

*a* Laid up, 43 steamers, measuring 16,138.30 tons, valued at \$795,800, included in the above.  
*b* Average wages, \$499.14 per annum.  
*c* Sixty-seven passengers and forty-six employes lost.  
*d* Average of coal used, per ton of custom-house measurement, 2.61 tons; wood, 0.05 cord on operating steamers.  
*e* Including 18 cable-boats on the Erie canal, measuring 1,800 tons.  
*f* Original capital; reinvestment of profits not given.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

## NEW JERSEY.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total.....	<i>a</i> 175	43,688.10	<i>Dollars.</i> 2,461,150	<i>Dollars.</i> 3,008,450	1,375	<i>Dollars.</i> 2,776,719	<i>Dollars.</i> 881,716	<i>Number.</i> 39,991,653	1,780,431	<i>c</i> 113,685	<i>c</i> 1,936
Passenger.....	24	9,214.82	380,000	461,700	260	356,987	101,387	2,356,535	257,983	20,180	1,682
Ferry.....	36	23,463.46	1,274,000	1,138,700	401	1,247,477	383,293	37,628,278	1,149,543	42,571	5
Freight.....	18	3,210.11	169,000	228,500	137	87,548	56,628	.....	261,680	7,032	136
Towing.....	65	5,754.08	551,400	1,087,200	445	939,036	292,583	.....	.....	39,021	55
Canal.....	12	1,876.93	59,000	65,000	104	160,926	43,715	.....	111,200	4,655	52
Yachts.....	20	168.70	27,750	27,350	28	4,745	4,110	.....	20	226	6

*a* Four steamers, measuring 396.23 tons, laid up, included in the above.*b* Average wages, \$641.24 per annum.*c* Average of coal used, per ton of custom-house measurement, 2.60 tons; wood, 0.04 cord.

## PENNSYLVANIA.

Grand total.....	416	116,601.11	8,479,300	10,137,393	6,080	7,555,525	<i>a</i> 2,437,835	<i>b</i> 1,623,115	1,921,347	<i>c</i> 529,241	<i>c</i> 1,197
UNITED STATES WATERS.											
<i>Atlantic coast.</i>											
Ocean passenger.....	10	17,538.84	1,175,000	1,406,400	512	1,419,884	388,184	14,376	234,915	65,576	.....
Inland passenger.....	19	7,710.84	656,500	779,500	207	261,945	59,437	695,238	97,040	27,772	374
Ferry.....	8	1,649.48	229,000	130,000	123	78,262	23,985	501,250	2,100	4,109	23
Freight.....	25	18,435.17	1,123,500	1,619,606	364	936,237	165,377	.....	729,877	55,292	270
Towing.....	115	8,230.32	1,246,500	1,629,937	691	666,635	260,489	.....	.....	55,101	146
Yachts.....	26	522.01	85,800	105,800	85	3,800	41,091	16,850	1,800	2,507	7
Canal.....	24	3,533.81	139,000	198,900	158	146,161	43,843	.....	73,980	6,507	119
Total.....	227	57,620.47	4,655,300	5,870,143	2,140	3,512,924	982,406	1,227,714	1,144,712	216,864	939
<i>Western rivers.</i>											
Passenger.....	24	7,010.67	361,100	423,000	415	573,199	152,437	100,442	299,355	46,809	250
Ferry.....	7	624.69	20,000	40,000	20	23,020	11,477	84,300	.....	2,598	.....
Towing.....	120	26,166.76	1,730,300	1,790,050	1,774	2,153,226	928,681	.....	.....	229,339	.....
Total.....	151	33,802.12	2,161,400	2,258,050	<i>d</i> 2,209	2,764,445	1,092,595	184,742	299,355	278,746	250
<i>Northern lakes.</i>											
Passenger.....	10	8,707.66	664,700	937,000	630	466,564	132,077	32,169	174,685	12,270	.....
Freight.....	12	16,101.68	945,800	982,500	992	740,977	203,505	.....	302,095	19,787	.....
Towing.....	3	85.09	9,600	7,200	17	12,275	10,631	.....	.....	410	.....
Yachts.....	1	74.90	10,000	10,000	7	.....	1,750	.....	.....	100	.....
Total.....	26	24,969.33	1,630,100	1,956,700	1,646	1,219,316	352,963	32,169	476,780	32,567	.....
STATE WATERS.											
Passenger.....	12	209.19	32,500	52,500	35	58,340	9,371	178,490	.....	1,064	8
Total.....	12	209.19	32,500	52,500	35	58,340	9,371	178,490	.....	1,064	8

*a* Average wages, \$404.20 per annum, including officers, crews, and roustabouts.*b* One employé and one passenger lost.*c* Average of coal used, per ton of custom-house measurement, 4.53 tons; wood, 0.01 cord.*d* In addition to the above there were 696 roustabouts employed on the Ohio river.

## DELAWARE.

UNITED STATES WATERS.											
Total.....	<i>a</i> 25	5,877.97	302,300	497,800	229	139,993	<i>b</i> 55,289	<i>c</i> 67,590	152,760	<i>d</i> 8,461	<i>d</i> 1,740
Passenger.....	7	3,736.13	170,000	329,000	137	80,762	35,948	67,000	119,760	4,490	1,700
Freight.....	4	1,740.48	65,000	75,000	24	21,429	6,270	.....	33,000	1,017	21
Towing.....	9	353.81	59,500	86,000	58	36,102	11,961	.....	.....	2,856	28
Yachts.....	5	47.55	7,800	7,800	10	1,700	1,110	590	.....	93	.....

*a* Two steamers included that are sailing under a foreign flag; capital held in this state and company organized under the laws of Delaware.*b* Average wages, \$241.43 per annum.*c* One employé lost.*d* Average of coal used, per ton of custom-house measurement, 1.44 tons; wood, 0.29 cord.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

MARYLAND.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total .....	<i>a</i> 169	45,967.16	<i>Dollars.</i> 3,886,750	<i>Dollars.</i> 4,625,750	2,554	<i>Dollars.</i> 3,075,640	<i>Dollars.</i> <i>b</i> 1,038,825	<i>Number.</i> <i>c</i> 908,832	995,353	<i>d</i> 124,717	<i>d</i> 870
Ocean passenger .....	7	9,615.06	728,500	1,283,100	862	695,954	318,500	4,386	347,950	23,338	.....
Inland passenger .....	40	20,184.91	1,871,000	1,670,400	740	1,166,900	297,453	326,166	329,099	45,916	539
Ferry .....	4	1,854.07	97,750	88,750	28	33,500	10,710	576,000	1,400	1,625	6
Freight .....	21	9,678.31	528,000	872,450	454	723,719	238,035	.....	316,904	23,827	174
Towing .....	75	3,304.92	576,800	625,450	405	451,667	167,437	.....	.....	28,920	141
Canal .....	11	1,130.00	15,800	15,800	33	( <i>e</i> )	.....	.....	.....	.....	.....
Yachts .....	11	199.89	68,900	69,800	32	3,900	6,690	2,280	.....	1,085	10

*a* Eleven canal steamers, measuring 1,130 tons, value \$15,800, and one steamer measuring 1,045.32 tons, laid up, included in the above.  
*b* Average wages, \$406 74 per annum.  
*c* One passenger and one employé lost.  
*d* Average of coal used, per ton of custom-house measurement, 2.71 tons; wood, 0.02 cord.  
*e* Incomplete reports.

DISTRICT OF COLUMBIA.

Total .....	34	6,945.77	595,000	832,960	237	300,576	<i>a</i> 83,100	<i>b</i> 87,009	63,500	<i>c</i> 20,739	<i>c</i> 125
Passenger .....	11	5,122.70	453,000	573,000	128	186,031	45,910	87,009	39,000	12,564	72
Freight .....	5	1,053.12	46,000	153,360	50	61,445	13,140	.....	24,500	4,125	26
Towing .....	15	561.96	60,300	70,000	52	53,100	23,000	.....	.....	3,745	19
Yachts .....	3	203.59	35,700	35,700	7	.....	1,050	.....	.....	305	8

*a* Average wages, \$350 63 per annum.  
*b* One passenger and one employé lost.  
*c* Average of coal used, per ton of custom-house measurement, 2.98 tons; wood, 0.02 cord.

TENNESSEE.

Total .....	<i>a</i> 61	11,348.40	589,000	<i>b</i> 703,500	<i>c</i> 976	1,035,196	<i>d</i> 329,329	<i>e</i> 76,203	399,565	<i>f</i> 75,110	<i>f</i> 27,573
Passenger .....	44	10,303.35	533,800	622,800	884	922,196	284,229	76,203	382,925	68,360	26,443
Freight .....	5	253.79	9,200	16,200	31	60,000	20,000	.....	16,640	1,600	840
Towing .....	12	781.26	46,000	69,500	61	53,000	25,100	.....	.....	5,150	290

*a* In addition to the above there were 2 steamers, measuring 918.93 tons, in existence a part of the year 1880. Two steamers, measuring 111.06 tons, laid up, included in the above.  
*b* In 15 leading lines: amount invested, \$466,800; number of boats, 30; tonnage, 7,702.17; length of routes, 4,252 miles.  
*c* In addition to the above there were 179 roustabouts employed.  
*d* Average wages, \$235 13 per annum, including officers, crew, and roustabouts.  
*e* One passenger lost.  
*f* Average of coal used, per ton of custom-house measurement, 6.61 tons; wood, 2.43 cords.

ARKANSAS.

Total .....	37	5,046.75	227,400	270,300	<i>a</i> 480	389,671	<i>b</i> 146,356	<i>c</i> 57,979	82,635	<i>d</i> 2,835	<i>d</i> 31,096
Passenger .....	23	3,835.87	174,000	218,300	304	304,756	117,433	22,379	67,790	78	28,917
Ferry .....	8	1,015.87	41,600	33,500	51	74,000	23,623	35,100	12,500	2,757	1,129
Freight .....	4	164.48	6,000	7,500	116	6,415	4,000	.....	2,345	.....	500
Towing .....	2	31.03	5,800	6,000	9	4,500	1,300	.....	.....	.....	550

*a* In addition to the above there were 173 roustabouts employed.  
*b* Average wages, \$224 12 per annum, including officers, crews, and roustabouts.  
*c* One employé lost.  
*d* Average of coal used, per ton of custom-house measurement, 0.56 ton; wood, 6.16 cords.

## STEAM NAVIGATION IN THE UNITED STATES.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc. : 1880—Continued.

## MISSISSIPPI.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total .....	<i>a</i> 40	3,657.20	<i>Dollars.</i> 204,450	<i>Dollars.</i> 242,150	<i>b</i> 443	<i>Dollars.</i> 300,140	<i>Dollars.</i> c 238,931	<i>Number.</i> 33,131	93,364	<i>d</i> 5,764	<i>d</i> 10,813
Passenger .....	16	2,527.93	119,800	151,300	314	238,439	213,241	13,891	90,064	2,732	10,254
Ferry .....	3	208.80	33,200	33,200	16	7,000	3,400	19,240	.....	300	8
Freight .....	6	432.34	12,200	14,700	47	22,160	10,185	.....	3,300	412	232
Towing .....	15	488.13	39,250	42,950	66	32,550	12,105	.....	.....	2,320	319

*a* In addition to the above there was one steamer, measuring 22.29 tons, in existence a part of the year 1880.*b* In addition to the above there were 73 roustabouts employed.*c* Average wages, \$463 04 per annum, including officers, crews, and roustabouts.*d* Average of coal used, per ton of custom-house measurement, 1.57 tons; wood, 2.95 cords.

## LOUISIANA.

Total .....	<i>a</i> 195	53,672.39	4,385,700	4,639,500	<i>b</i> 2,574	4,098,816	<i>c</i> 1,417,818	<i>d</i> 1,231,577	979,877	<i>e</i> 129,386	<i>e</i> 42,772
Ocean passenger .....	18	25,421.68	2,555,000	2,600,000	514	1,654,843	506,405	13,533	278,469	28,144	.....
Inland passenger .....	52	18,166.99	1,120,900	1,273,200	1,317	1,756,195	651,421	99,444	642,273	65,797	23,792
Ferry .....	15	2,791.36	145,200	154,000	114	174,970	62,950	1,118,600	.....	7,613	1,520
Freight .....	18	1,847.27	49,100	65,600	142	136,110	47,870	.....	59,135	4,420	5,315
Towing .....	75	4,710.64	404,900	436,100	411	269,398	133,812	.....	.....	21,900	11,570
Miscellaneous .....	17	734.45	110,600	110,600	76	7,300	15,360	.....	.....	1,512	575

*a* Twelve steamers, measuring 1,204.74 tons, included in the above, were laid up. Six steamers, measuring 1,163.08 tons, not included in the above, were in existence a part of the year 1880.*b* In addition to the above there were 1,271 roustabouts employed.*c* Average wages, \$363 74 per annum, including officers, crews, and roustabouts.*d* One passenger and 22 employes lost.*e* Average of coal used, per ton of custom-house measurement, 2.41 tons; wood, 0.79 cord.

## TEXAS.

Total .....	<i>a</i> 35	4,351.91	196,900	345,466	<i>b</i> 350	336,456	<i>c</i> 164,951	4,803	168,422	<i>d</i> 3,697	<i>d</i> 11,112
Passenger .....	14	2,765.60	76,500	154,000	196	177,471	78,959	4,603	124,362	680	7,261
Freight .....	6	1,123.45	79,000	86,500	68	65,250	24,500	.....	44,010	1,460	1,390
Towing .....	12	441.60	39,900	103,466	80	93,035	59,592	.....	.....	1,557	2,191
Yachts .....	3	21.26	1,500	1,500	6	700	1,900	200	50	.....	270

*a* One steamer, measuring 301.84 tons, not included in the above, was in existence a part of the year 1880.*b* Seven employes lost.*c* Average wages, \$471 28 per annum, including officers, crews, and roustabouts.*d* Average of coal used, per ton of custom-house measurement, 0.85 ton; wood, 2.55 cords.

## ALABAMA.

Total .....	<i>a</i> 43	7,168.17	257,600	421,700	702	437,465	<i>b</i> 251,220	<i>c</i> 51,237	184,187	<i>d</i> 240	<i>d</i> 38,528
Passenger .....	21	5,283.56	178,500	316,000	589	338,730	210,328	36,237	151,062	50	28,203
Ferry .....	2	39.30	1,500	5,000	6	12,000	1,300	15,000	1,200	100	200
Freight .....	7	1,278.50	38,200	33,200	42	8,300	2,644	.....	8,600	.....	2,050
Towing .....	13	566.81	30,400	62,500	65	78,435	36,948	.....	23,325	90	8,075

*a* Six steamers, measuring 1,972.48 tons, included in the above, were laid up. Two steamers, measuring 46.62 tons, not included in the above, were in existence a part of the year 1880.*b* Average wages, \$357 86 per annum, including officers, crews, and roustabouts.*c* Two passengers lost.*d* Average of coal used, per ton of custom-house measurement, 0.03 ton; wood, 5.37 cords.

STATISTICAL TABLES.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

FLORIDA.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total.....	a 70	6,826.60	Dollars. 448,500	Dollars. 638,800	b 587	Dollars. 510,808	Dollars. b 165,386	Number. c 40,417	76,926	d 10,039	d 26,073
Ocean passenger.....	6	2,698.41	156,000	182,000	92	205,800	35,160	6,900	48,900	8,220	3,498
Inland passenger.....	24	2,624.70	140,400	283,800	332	176,304	76,865	32,320	27,828	1,370	11,741
Towing.....	24	1,405.05	133,000	152,700	124	121,984	46,701	.....	.....	322	10,331
Yachts.....	16	98.44	10,100	20,300	30	6,720	6,570	1,197	198	127	503

a Two steamers, measuring 115.15 tons, not included in the above, were in existence a part of the year 1880.  
 b Average wages, \$281.74 per annum, including officers, crews, and roustabouts.  
 c One passenger and one employé lost.  
 d Average of coal used, per ton of custom-house measurement, 1.47 tons; wood, 3.81 cords.

VIRGINIA.

Total.....	a 89	6,251.02	494,400	526,350	401	567,793	b 187,661	1,556,609	139,048	c 29,904	c 8,621
Passenger.....	15	2,146.09	135,000	155,000	155	162,276	43,101	53,509	72,988	3,095	2,766
Ferry.....	5	1,078.84	67,500	67,500	24	55,200	10,700	1,502,400	.....	5,350	.....
Freight.....	15	1,113.29	54,500	66,750	65	94,768	37,335	.....	66,060	5,368	578
Towing.....	48	1,871.10	232,800	232,200	235	254,940	94,315	.....	.....	15,419	274
Yachts.....	6	41.70	4,600	4,900	12	600	2,210	700	.....	72	3

a Three steamers, measuring 178.65 tons, included in the above, laid up and no business reported.  
 b Average wages, \$382.20 per annum, including officers, crews, and roustabouts.  
 c Average of coal used, per ton of custom-house measurement, 4.78 tons; wood, 0.57 cord.

NORTH CAROLINA.

Total.....	a 52	3,850.86	205,700	231,900	335	419,964	b 110,335	29,421	180,219	c 5,030	c 14,569
Passenger.....	30	3,171.76	158,200	188,800	233	375,364	92,755	29,421	179,919	4,184	12,131
Freight.....	3	458.04	16,500	16,000	20	20,000	6,180	.....	9,300	650	175
Towing.....	4	90.36	11,100	12,200	15	9,500	6,020	.....	.....	60	1,975
Fishing.....	15	130.70	19,900	14,900	67	15,100	5,380	.....	.....	136	238

a Five steamers, measuring 151.01 tons, laid up and business reported included in the above.  
 b Average wages, \$329.35 per annum, including officers, crews, and roustabouts.  
 c Average of coal used, per ton of custom-house measurement, 1.30 tons; wood, 3.78 cords.

SOUTH CAROLINA.

Total.....	a 41	5,242.10	242,700	397,850	332	386,260	b 150,936	135,604	97,204	c 7,889	c 19,657
Passenger.....	13	3,268.50	141,800	225,400	169	181,065	79,020	17,168	71,298	4,549	11,729
Ferry.....	3	495.87	14,500	30,000	39	43,830	16,144	118,436	9,046	.....	1,850
Freight.....	5	712.36	17,300	40,150	43	36,898	15,850	.....	16,920	.....	3,974
Towing.....	18	750.27	67,800	101,000	77	123,761	39,272	.....	.....	3,336	2,050
Yachts.....	2	15.10	1,300	1,300	4	706	650	.....	.....	4	54

a Two steamers included in the above, measuring 48.15 tons, were laid up and no business reported.  
 b Average of wages, \$454.62 per annum, including officers, crews, and roustabouts.  
 c Average of coal used, per ton of custom-house measurement, 1.50 tons; wood, 3.74 cords.

GEORGIA.

Total.....	a 44	13,331.46	1,387,300	1,680,500	494	1,091,430	b 325,157	34,701	114,030	c 22,045	c 15,831
Ocean passenger.....	5	9,055.31	1,075,000	1,350,000	190	819,890	217,655	8,815	68,630	18,435	.....
Inland passenger.....	21	3,338.06	262,500	233,500	243	186,890	79,540	14,520	45,400	1,420	13,959
Towing.....	12	897.98	46,200	47,200	48	77,650	23,532	.....	.....	2,190	1,508
Yachts.....	6	40.11	3,600	5,800	13	7,000	4,430	11,366	.....	.....	364

a Three steamers, measuring 506.43 tons, laid up, included in the above.  
 b Average of wages, \$658.21 per annum, including officers, crews, and roustabouts.  
 c Average of coal used, per ton of custom-house measurement, 1.65 tons; wood, 1.18 cords.

## STEAM NAVIGATION IN THE UNITED STATES.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

## CALIFORNIA.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Grand total .....	187	59,030.44	Dollars. 3,792,800	Dollars. 5,946,436	a 1,987	Dollars. 4,020,024	Dollars. b 1,164,200	Number. 6,317,452	1,570,056	c 137,349	c 14,323
UNITED STATES WATERS.											
Ocean passenger .....	d 21	18,398.86	1,230,000	1,300,485	649	1,018,833	291,326	8,289	240,533	22,757	12
Inland passenger .....	71	14,523.25	611,400	1,614,268	680	911,221	328,452	132,361	350,257	33,144	10,009
Ferry .....	22	20,308.25	1,353,000	2,051,500	262	1,102,363	207,146	6,168,852	724,711	52,304	755
Freight .....	21	3,301.29	186,300	391,085	210	625,621	182,838	.....	236,705	16,272	1,465
Towing .....	32	2,237.18	363,600	540,298	146	353,046	148,438	.....	.....	12,872	1,882
Yachts .....	11	59.97	18,900	19,200	23	.....	.....	.....	.....	.....	.....
Total .....	178	58,823.80	3,763,200	5,916,836	1,970	4,011,084	1,158,200	6,309,502	1,561,256	137,349	14,123
STATE WATERS.											
Passenger .....	9	201.64	29,600	29,600	17	8,940	6,000	7,950	8,800	.....	200
Total .....	9	201.64	29,600	29,600	17	8,940	6,000	7,950	8,800	.....	200

a Three employes lost.

b Average wages, \$585 90 per annum, including officers, crews, and roustabouts.

c Average of coal used, per ton of custom-house measurement, 2.32 tons; wood, 0.24 cord.

d Nine steamships, one tug, and one launch, measuring 26,323.45 tons, and valued at \$2,442,000, property of Pacific Mail Steamship Company, credited to New York.

## DAKOTA TERRITORY.

Total .....	19	7,591.67	328,000	382,000	a 392	450,955	b 152,979	8,114	38,686	c 295	c 31,394
Passenger .....	17	7,525.86	321,000	363,000	380	492,155	144,269	8,114	38,686	275	30,094
Towing .....	2	65.81	7,000	19,000	12	18,800	8,710	.....	.....	20	1,300

a In addition to the above there were 243 roustabouts employed.

b Average wages, \$240 91 per annum, including officers, crews, and roustabouts.

c Average of coal used, per ton of custom-house measurement, 0.03 ton; wood, 4.13 cords.

## OREGON.

Total .....	89	31,370.94	2,177,000	2,394,754	a 788	1,983,703	b 602,576	159,903	476,898	c 8,233	c 22,889
Passenger .....	73	28,759.59	2,021,700	2,230,704	720	1,893,907	554,554	66,615	447,801	8,157	13,858
Ferry .....	5	1,343.40	52,500	73,000	13	23,546	14,582	93,288	28,372	.....	1,788
Freight .....	2	200.81	7,000	6,250	8	7,500	3,780	.....	725	.....	485
Towing .....	9	1,067.14	95,800	84,800	47	58,750	29,660	.....	.....	76	7,031

a Two employes lost.

b Average wages, \$764 69 per annum, including officers, crews, and roustabouts.

c Average of coal used, per ton of custom-house measurement, 0.26 ton; wood, 0.73 cord.

## WASHINGTON TERRITORY.

Total .....	52	6,805.14	537,300	542,900	250	367,983	a 192,675	b 135,307	49,139	c 825	c 66,434
Passenger .....	31	5,093.51	351,100	368,300	167	239,800	132,870	93,487	39,961	300	42,984
Ferry .....	5	342.34	23,600	24,600	9	26,133	8,345	41,820	6,310	.....	1,430
Freight .....	5	115.12	7,400	7,400	10	4,150	1,800	.....	2,868	75	280
Towing .....	11	1,254.17	155,200	142,600	64	97,840	49,600	.....	.....	450	21,740

a Average wages, \$770 70 per annum, including officers and crews.

b One employe lost.

c Average of coal used, per ton of custom-house measurement, 0.12 ton; wood, 9.76 cords.

Statement of the number, tonnage, value, capital invested, service, and traffic of the steam craft, etc.: 1880—Continued.

NEBRASKA.

Class.	Number of steamers.	Tonnage.	Value of steamers.	Capital invested.	Crews (persons).	Gross earnings.	Paid for services.	Passenger traffic.	Freight traffic, in tons.	FUEL USED.	
										Coal, in tons.	Wood, in cords.
Total.....	14	1, 193. 52	Dollars. 64, 300	Dollars. 87, 900	63	Dollars. 55, 304	Dollars. a 29, 775	Number. b 88, 306	c 320, 180	d 3, 986	d 1, 365
Ferry.....	12	1, 171. 52	63, 800	83, 500	60	55, 004	29, 685	88, 306	320, 180	3, 986	1, 340
Yachts.....	2	22. 00	500	4, 400	3	300	90	.....	.....	.....	25

a Average wages, \$472 61 per annum, including officers, crews, and roustabouts.

b Includes 20,306 railroad transfers.

c Includes 311,660 tons railroad transfer freight.

d Average of coal used, per ton of custom-house measurement, 3.34 tons; wood, 1.14 cords.

In the foregoing tables this steamboat property has been assigned to the states where it was owned in 1880. In cases where the ownership was obscure or divided the legal headquarters or the address of the managing owner was taken as authority for assigning the craft to a state, but very few of these perplexing cases were found. The Pacific Mail Steamship Company, owned in New York, but operating lines from San Francisco, under this ruling was assigned to the state of New York. State interests are divided in many cases, in order to show the groupings. Lake Champlain is not classed with the northern lakes, as is usually the case, and the group of the Upper Missouri includes the Red River of the North, while in all the groups tributary streams are included. Group IV, for instance, represents the Ohio river and its tributaries.

CHAPTER IV.—TONNAGE TABLES.

Table VII (pages 60 and 61), compiled from census reports, records of the register of the treasury, and from special circulars sent to collectors of customs in each district, shows the tonnage of all classes owned within the United States, including steam, sail, barge, canal-boats, etc. The customs officers ceased registering barges and canal-boats in 1878, but from the records in their offices they were enabled to furnish statements of the number and tonnage of such boats owned within their districts with fair accuracy, so that the table will be found closely approximating the total floating interests of the country.

In Table VIII (page 62) the steam tonnage owned by the United States government is given.

TABLE VII.—MERCHANT TONNAGE OF THE UNITED STATES.

Statement of the approximate number, tonnage, and value of the steamers, sailing-vessels, canal-boats, barges, flats, and wharf-boats of the United States for 1880.

Grand total for the United States of craft of all descriptions: Number, **38,656**; tonnage, **6,487,309.63**; value, **\$155,784,709**.

States and Territories.	STEAM.			SAIL.			CANAL.		
	No.	Tonnage.	Value.	No.	Tonnage.	Value.	No.	Tonnage.	Value.
Grand total.....	a 5,139	1,221,200.93	\$80,192,495	10,820	b 2,366,132.06	c \$59,152,950	8,771	1,253,688.23	\$8,273,255
Total.....	515	120,177.83	8,038,150	5,660	940,988.62	23,524,650	16	1,372.00	21,500
1 Maine.....	112	16,991.66	1,135,700	2,556	491,348.45	12,283,700			
2 New Hampshire.....	25	1,199.58	122,900	69	9,482.14	237,050			
3 Vermont.....	12	2,250.26	221,300	17	937.86	23,425	12	1,000.00	20,000
4 Massachusetts.....	180	48,917.68	3,266,400	2,136	378,333.09	9,458,325			
5 Rhode Island.....	70	21,486.52	1,539,650	241	16,587.91	414,675			
6 Connecticut.....	116	29,323.13	1,752,200	641	44,299.17	1,107,475	4	372.00	1,500
Total.....	2,049	577,524.61	41,433,150	6,407	914,907.40	22,872,575	8,213	1,216,689.23	7,743,405
1 New York.....	d 1,230	358,444.50	25,708,650	2,984	623,680.97	15,592,000	5,228	840,892.00	5,018,755
2 New Jersey.....	175	49,688.10	2,461,150	906	58,122.85	1,453,050	544	46,777.23	437,050
3 Pennsylvania.....	416	116,601.11	8,479,300	655	137,199.80	3,429,975	1,940	278,870.00	1,885,000
4 Delaware.....	25	5,877.97	302,300	159	12,127.56	303,175	1	150.00	2,600
5 Maryland.....	169	45,967.16	3,886,750	1,645	81,855.77	2,046,375	467	46,700.00	373,600
6 District of Columbia.....	34	6,945.77	595,000	58	1,920.45	48,000	33	3,300.00	26,400
Total.....	850	151,501.09	10,282,750	2,801	126,078.05	3,151,825	77	4,191.00	43,350
1 Virginia.....	89	6,251.02	494,400	1,061	26,688.28	665,950	57	3,591.00	31,350
2 West Virginia.....	61	7,497.34	312,600						
3 North Carolina.....	52	3,850.86	205,700	289	9,157.87	228,925			
4 South Carolina.....	41	5,242.10	242,700	173	5,017.46	125,425			
5 Georgia.....	44	13,331.46	1,387,300	86	9,354.07	233,850	20	600.00	12,000
6 Florida.....	70	6,826.60	448,500	323	25,332.56	633,300			
7 Alabama.....	43	7,168.17	257,600	73	7,936.83	198,400			
8 Mississippi.....	40	3,657.20	204,450	119	2,969.99	74,225			
9 Louisiana.....	195	53,672.39	4,385,700	447	31,953.49	798,950			
10 Texas.....	35	4,351.91	196,900	230	7,712.50	192,800			
11 Arkansas.....	37	5,046.75	227,400						
12 Kentucky.....	91	23,256.89	1,300,500						
13 Tennessee.....	61	11,348.40	589,000						
Total.....	1,388	274,796.88	13,961,345	1,200	235,753.48	5,893,925	465	31,436.00	465,000
1 Ohio.....	236	73,524.60	3,612,700	196	56,275.32	1,406,875	361	21,660.00	361,000
2 Indiana.....	51	7,744.80	399,000						
3 Illinois.....	171	22,546.12	1,226,800	275	66,528.27	1,663,200	104	9,776.00	104,000
4 Michigan.....	422	67,093.42	4,550,725	470	62,105.15	1,552,625			
5 Wisconsin.....	177	19,249.04	1,020,400	258	50,800.11	1,270,000			
6 Iowa.....	70	9,861.09	387,350						
7 Minnesota.....	61	5,118.52	273,270	1	49.63	1,225			
8 Missouri.....	167	60,873.50	2,093,800						
9 Nebraska.....	14	1,193.52	64,300						
10 Dakota.....	19	7,591.67	328,000						
Total.....	328	97,206.52	6,507,100	752	148,400.41	3,709,975			
1 Oregon.....	89	31,370.94	2,177,000	38	7,041.33	176,025			
2 California.....	187	59,030.44	3,792,800	652	117,970.52	2,949,250			
3 Arizona.....									
4 Washington.....	52	6,805.14	537,300	62	23,388.56	584,700			

a The excess of steam tonnage over that reported by the register of the treasury is due to the enumeration of state water interests and small yachts under five tons.

b There are ten vessels, measuring 125.07 tons, in Alaska not included but reported by the register of the treasury.

c Valuations by insurance experts on a basis of \$25 per ton, decimal omitted.

d Including 18 cable-boats on Erie canal.

TONNAGE TABLES.

TABLE VII.—MERCHANT TONNAGE OF THE UNITED STATES.

Statement of the approximate number, tonnage, and value of the steamers, sailing-vessels, canal-boats, barges, flats, and wharf-boats of the United States for 1880.

Grand total for the United States of craft of all descriptions: Number, **38,656**; tonnage, **6,487,309.63**; value, **\$155,784,709.**

BARGES.			FLATS.			WHARF-BOATS.			HULKS.		
No.	Tonnage.	Value.	No.	Tonnage.	Value.	No.	Tonnage.	Value.	No.	Tonnage.	Value.
5,033	1,331,562.88	\$6,430,464	2,702	220,690.47	\$1,286,020	145	80,300.00	\$885,100	40	7,688.16	\$64,425
108	14,144.94	194,689	20	970.00	8,425				2	400.00	9,000
3	645.92	8,000	3	300.00	225						
32	5,040.71	50,384	23	570.00	7,400				2	400.00	9,000
73	8,460.31	130,305	3	100.00	800						
3,524	865,406.18	4,412,940	935	75,343.00	801,700	9	3,270.00	8,800	10	1,774.00	2,250
628	148,009.29	1,490,140	88	17,200.00	454,500	1	110.00	1,500	4	344.00	250
77	15,516.47	133,300									
2,801	699,992.71	2,740,600	819	57,590.00	342,600	8	3,160.00	7,300	6	1,430.00	2,000
9	1,342.37	45,500	6	300.00	3,500						
4	423.34	3,000									
5	122.00	500	22	253.00	1,100						
591	126,642.68	384,980	1,169	88,632.47	287,895	48	29,400.00	108,450	26	3,900.16	40,050
38	3,640.50	11,100	146	1,500.00	10,500				10	150.00	50
290	26,707.17	174,000	160	30,000.00	32,000	14	8,400.00	20,600			
			144	8,940.00	36,800						
1	50.64	800	374	10,665.00	124,150						
4	425.00	5,800	50	2,405.00	19,355						
6	400.00	3,000									
3	524.00	1,700	8	336.00	3,050						
36	2,689.81	22,000	6	3,648.00	5,000	1	1,000.00	5,000			
60	25,178.06	41,180	52	3,653.00	18,165	7	5,400.00	15,000	6	1,750.16	37,000
19	2,927.50	23,000	4	90.00	2,600						
3	600.00	600	75	750.00	6,000						
102	60,000.00	96,000	150	26,645.47	30,375	26	14,600.00	67,850	10	2,000.00	3,000
29	3,500.00	5,800									
702	302,969.28	1,323,875	467	52,805.00	161,000	79	51,020.00	263,750	8	1,504.00	13,125
165	58,153.51	114,000	238	30,930.00	61,225	25	12,550.00	99,200	2	300.00	200
14	1,287.22	12,000				22	12,000.00	53,150			
53	18,913.84	33,150	88	2,910.00	9,800	13	7,720.00	38,500			
124	30,056.43	93,225	32	4,536.00	42,575				6	1,264.00	12,925
15	3,100.83	7,600	30	5,000.00	25,000						
33	6,059.18	4,000	56	860.00	9,600	3	1,500.00	3,900			
32	2,268.72	12,800									
254	181,319.00	1,037,000	23	2,569.00	12,800	16	17,260.00	69,000			
12	1,219.55	9,500									
108	22,999.80	113,980	102	2,940.00	27,000	9	2,700.00	4,100			
12	7,616.60	9,600	88	1,970.00	17,000	9	2,700.00	4,100			
74	13,709.00	100,180	14	970.00	10,000						
4	554.20	1,600									
18	1,120.00	2,600									

## STEAM NAVIGATION IN THE UNITED STATES.

TABLE VIII.—STEAM TONNAGE OWNED BY THE UNITED STATES GOVERNMENT.

Statement of the number and tonnage of steam vessels of the United States navy, revenue marine, light-house board, quartermaster's department, etc.

[Official Record, 1881.]

	Number.	Tonnage.
United States navy, naval steamers .....	66	83,958.00
iron-clad steamers .....	24	24,254.00
torpedo rams .....	2	749.00
tugs .....	25	4,129.00
Total U. S. Navy .....	117	113,090.00
Revenue marine .....	31	6,765.00
Engineer department .....	58	7,558.96
Light-house board .....	23	7,076.00
Quartermaster's department .....	15	1,025.23
United States coast and geodetic survey (a) .....	10	1,218.00
Mississippi river commission .....	2	90.00
United States commission of fish and fisheries (a) .....	7	1,204.00
Marine hospital service (a) .....	1	88.83
Total .....	264	138,115.52

a Not reported in Official Record.

b Three steamers and four launches.

## SUMMARY OF THE TONNAGE OF THE UNITED STATES.

Adding to the above 264 steamers, measuring 138,115.52 tons, the 5,139 steamers of the steam merchant marine, measuring 1,221,206.93 tons, we have a grand total of 5,403 steamers, measuring 1,359,322.45 tons, representing the entire steam navigation interests of the United States.

Adding to the total merchant tonnage of the United States, as shown in Table VII, amounting to 38,656 crafts, measuring 6,487,309.63 tons, 312 crafts, measuring 167,687.52 tons, owned by the United States government, we have of marine property in this country a grand total approximating 38,968 crafts, measuring 6,654,997.15 tons.

# INDEX TO STEAM NAVIGATION.

	Table.	Page.		Table.	Page.
<b>A.</b>					
Ainsworth, Captain J. C., exploit of .....		28	Coal-boat, hands employed and wages paid on a .....		38
Alabama, merchant tonnage of .....	VII	60, 61	Coal depots, establishment of, by Pacific Mail Company .....		24
Alabama, steam craft of, on United States waters .....	V, VI	47, 56	Coal, rates and shipments of .....		38, 39
Allen, Dr. John, pumping boat of .....		1	Colorado river, first steamboat to run on the .....		26
American Fur Company, steamboats built by the .....		21	Colorado river, steam on the .....		26
American Steamship Company, when organized .....		10	Colorado Steam Navigation Company, origin of the .....		26
Antelope, the first steamer to arrive at Saint Louis .....		14	Columbia river, construction on the .....		27
Arkansas, merchant tonnage of .....	VII	60, 61	Columbia river, description of the .....		27
Arkansas, steam craft of, on United States waters .....	V, VI	47, 55	Columbia river, Middle, construction on the .....		28
Atlantic coast, number and tonnage of steamers constructed on the .....	Table.	20, 21	Columbia, tonnage of the steamer .....		12
Atlantic ocean, first steamboat to cross the .....		18	Connecticut, building and description of the steamer .....		9
Auxiron, Count, experiments of .....		1	Connecticut, merchant tonnage of .....	VII	60, 61
<b>B.</b>			Connecticut, steam craft of, on United States waters .....	V, VI	46, 50
Baltimore, first steamboat built at .....		17	Construction records .....	Table.	4
Baltimore, names of steamers (in 1820) in service at .....		17	Crews, number and average of, employed on United States vessels .....	I-VI	44-50
Baltimore, number and tonnage of steamers constructed at .....	Table.	20, 21	Crews ( <i>see</i> summary for each group) .....	Tables.	34-43
Bangor, description and route of the .....		9	Cunard line, operations of .....		10
Barges, capacity and value of .....		37	<b>D.</b>		
Barges, number, tonnage, and value of .....	VII	61	Dakota, merchant tonnage of .....	VII	60, 61
Benicia, Pacific Mail Company's workshops at .....		24	Dakota, steam craft of, on United States waters .....	V, VI	48, 58
Bolton, Samuel, patent issued to .....		1	Danin, the first tow-boat in Boston harbor .....		10
Boston and Bangor Steamship Company, when organized .....		9	De Jouffroy, invention of .....		1
Boston and Philadelphia Steamship Company, organization of .....		10	Delaware, merchant tonnage of .....	VII	60, 61
Bourne, patent obtained by .....		1	Delaware river, first steamboat on the .....		17
<b>C.</b>			Delaware, steam craft of, on United States waters .....	V, VI	47, 54
California, merchant tonnage of .....	VII	60, 61	District of Columbia, merchant tonnage of the .....	VII	60, 61
California, steam craft of, on state waters .....	III	45	District of Columbia, steam craft of, on United States waters .....	V, VI	47, 55
California, steam craft of, on United States waters .....	V, VI	47, 58	<b>E.</b>		
California Steam Navigation Company, steamers owned and run by the .....		23	Eagle, construction and route of the .....		9
California, trip of the Pacific mail steamship .....		22	Early inventors .....		1
Camden, construction of the .....		4	Earnings, amount of, by United States vessels .....	I-VI	22, 44-50
Canal-boats, number, tonnage, and value of .....	VII	60	Earnings ( <i>see</i> summary for each group) .....		34-43
Canals of the United States, number, tonnage, etc., of steam craft employed on .....	IV	45	Eastern Steamship Mail Line, vessels of .....		9
Capital invested in steamers, etc., in the United States .....	I-VI	44-50	England, first experiments made in .....		1
Capital invested ( <i>see</i> summary for each group) .....		34-43	Eric and Western Transportation Company, steamers of, on Buffalo and Chicago line .....	Table.	36
Car of Neptune, second steamer built by Fulton .....		4	Eruktor Amphibolis, description and illustration of .....		3
Cascades Portage railroad, location and length of .....		28	Escanaba, iron-ore shipments from .....	Table.	35
Chancellor Livingston, "the masterpiece of Fulton" .....		9	Evans, E. T., statement of results of compound engines in propellers .....	Table.	36
Charleston, first mail steamer to .....		18	Evans, Oliver, experiment and remarks of .....		3
Charleston, first steamer built at .....		17	Experiments, list of early .....		3
Charlotte Dundas, description and illustration of .....		3	Exports of flour and grain from New Orleans .....	Table.	41
Charter Oak, route of the .....		9	<b>F.</b>		
Chippewa, trip of the .....		21	Ferry steamers, average tonnage, value, and crew of .....	Table.	33
Chronological list of early experiments .....		3	Fire-Fly, construction of the .....		4
Cincinnati, number and tonnage of vessels constructed at .....	Table.	13, 14	Fishing steamers, average tonnage, value, and crew of .....	Table.	33
Classes and averages of steam vessels of the United States .....	Tables.	33, 34	Fitch, John, inventions and experiments of .....		1-3
Clermont, construction and first trip of the .....		4	Fitch, John, legislatures grant exclusive rights to .....		1
Clipper-ships, building of .....		10	Flat-boats, number, tonnage, and value of .....	VII	61
Coal, amount of, consumed by steam vessels of the United States .....	I-VI	32, 44-59	Florida, merchant tonnage of .....	VII	60, 61
Coal, amount of, consumed ( <i>see</i> summary for each group) .....		34-43	Florida, steam craft of, on United States waters .....	V, VI	47, 57
			Ford, Edward, method of propulsion patented by .....		1
			Foreign tonnage in 1836 .....	Table.	7

	Table.	Page.		Table.	Page.
France, first steamboat experiments in .....		1			
Freight steamers, average tonnage, value, and crew of .....	Table.	33			
Freight traffic, tons carried in the United States .....	I-VI	32, 44-59			
Freight traffic ( <i>see</i> summary for each group) .....		34-43			
French, Daniel, patent issued to .....		1			
Frontenac, the first steamer on Canadian waters .....		11			
Fuel, amount of, consumed on vessels in the United States .....	I-VI	44-59			
Fuel, question of .....		32, 35-37, 39, 40			
Fuel ( <i>see</i> summary for each group) .....		34-43			
Fulton, construction of the steamer .....		4			
Fulton, Robert, construction and first trip of the steamer .....		18			
Fulton, Robert, patent issued to, and experiments of .....		1, 3, 4			
<b>G.</b>					
General Warren, where built, and route of the .....		10			
Georgia, merchant tonnage of .....	VII	60, 61			
Georgia, steam craft of, on United States waters .....	V, VI	47, 57			
Governor Marcy, first steamer to run to Saginaw .....		12			
Grain, charges for transporting to Europe .....		37			
Grain trade on the northern lakes, number, tonnage, and value of steamers employed in the .....		35			
Greut, Thomas, method of propulsion patented by .....		1			
Group interests .....	V	46-48			
Group summaries .....	Tables.	34-43			
Growth of steam navigation on the northern lakes retarded by want of good harbors .....		12			
<b>H.</b>					
Hester, H. G., table prepared by, showing the exports of flour and grain from New Orleans .....		41			
High-pressure engines, when first used in steamers .....		18			
Horse-power in 1838 .....	Table.	6			
Hulls, number, tonnage, and value of .....	VII	61			
Hulls, Jonathan, invention by .....		1			
<b>I.</b>					
Illinois, canal interests of .....	IV	45			
Illinois, merchant tonnage of .....	VII	60, 61			
Illinois, steam craft of, on United States waters .....	V, VI	46, 51			
Illustrations of early steamboats .....		1-3			
Indiana, merchant tonnage of .....	VII	60, 61			
Indiana, steam craft of, on United States waters .....	V, VI	46, 53			
Inventors, early .....		1			
Inspection laws, revision of .....		6			
Inspections of steam vessels .....	Table.	7			
Iowa, merchant tonnage of .....	VII	60, 61			
Iowa, steam craft of, on state waters .....	III	45			
Iowa, steam craft of, on United States waters .....	V, VI	46, 48, 52			
Iron-ore, distribution of, on the northern lakes .....	Table.	35			
Iron-ore trade, steamers engaged in, on the northern lakes .....		35			
<b>J.</b>					
Joseph Whitney, first trip of the steamer .....		10			
<b>K.</b>					
Kennebec Steam Navigation Company, organization of .....		9			
Kentucky, merchant tonnage of .....	VII	60, 61			
Kentucky, steam craft of, on United States waters .....	V, VI	46, 52			
Kentucky, the first steamer built at Louisville .....		12			
<b>L.</b>					
Lake Ontario, commerce of .....		11			
L'Anse, iron-ore shipment from .....	Table.	35			
Legislator, description of the .....		9			
Letter of transmittal .....		v			
Lives lost, number of .....	Tables.	4, 5, 32, 34, 38			
Livingston, R. R., patents of .....		4			
Local interests, history of .....		5			
Longstreet, William, experiment of .....		3			
Louisiana, merchant tonnage of .....	VII	60, 61			
Louisiana, steam-craft of, on United States waters .....	V, VI	47, 56			
Louisville, number and tonnage of vessels constructed at .....	Table.	13, 14			
Lumber trade, number of steamers engaged in the, on the northern lakes .....		35			
<b>M.</b>					
Maine, description and rates of the steamer .....					9
Maine, merchant tonnage of .....	VII				60, 61
Maine, steam craft of, on state waters .....	III				45
Maine, steam craft of, on United States waters .....	V, VI				46, 48
Mare Island, government dock at, completion of the .....					24
Marquette, iron-ore shipments from .....	Table.				35
Maryland, canal interests of .....	IV				45
Maryland, merchant tonnage of .....	VII				60, 61
Maryland, steam craft of, on United States waters .....	V, VI				47, 55
Massachusetts, description of the steamboat .....					9
Massachusetts, merchant tonnage of .....	VII				60, 61
Massachusetts, steam craft of, on state waters .....	III				45
Massachusetts, steam craft of, on United States waters .....	V, VI				46, 49
Memoranda .....					12
Merchant marine, summary of .....					32
Merchants' and Miners' Transportation Company .....					10
Merchant tonnage of the United States .....	VII				60, 61
Metropolitan Steamship Company .....					10
Michigan, merchant tonnage of .....	VII				60, 61
Michigan, steam craft of, on state waters .....	III				45
Michigan, steam craft of, on United States waters .....	V, VI				46, 50
Middle and South Atlantic states .....	Tables.				17-21
Miller, Patrick, experiments of .....					3
Minnesota, merchant tonnage of .....	VII				60, 61
Minnesota, steam craft of, on state waters .....	III				45
Minnesota, steam craft of, on United States waters .....	V, VI				46, 51
Mississippi, merchant tonnage of .....	VII				60, 61
Mississippi, steam craft of, on United States waters .....	V, VI				47, 56
Missouri, merchant tonnage of .....	VII				60, 61
Missouri river, first steamboat to explore the .....					14
Missouri, steam craft of, on United States waters .....	V, VI				46, 52
Model barges, number and value of .....					37
Monongahela river, coal-mining along the banks of .....					39
Monongahela river, pools or pockets on .....					39
Moore, Augustus, remarks of, relating to fuel, cylinders, boilers, and the use of steam .....					39
Morrison, Michael, patent issued to .....					1
Mowry, Captain Samuel, experiment of .....					3
<b>N.</b>					
Napa, first steamboat to run to .....					24
Nassau, construction of the steamer .....					4
National Intelligencer, extract from, in relation to the steamer Washington .....					18
Nebraska, merchant tonnage of .....	VII				60, 61
Nebraska, steam craft of, on United States waters .....	V, VI				48, 59
Neptune line, steamers of the .....					10
New England states, steamboat building in the .....	Table.				9-11
New England states, steam tonnage of the .....	Table.				11
New Hampshire, merchant tonnage of .....	VII				60, 61
New Hampshire, steam craft of, on state waters .....	III				45
New Hampshire, steam craft of, on United States waters .....	V, VI				46, 48
New Jersey, canal interests of .....	IV				45
New Jersey, merchant tonnage of .....	VII				60, 61
New Jersey, steam craft of, on United States waters .....	V, VI				47, 54
New Orleans, exports of flour and grain from .....	Table.				41
New Orleans, first steamboat built at .....					13
New York, canal interests of .....	IV				45
New York, merchant tonnage of .....	VII				60, 61
New York, steam craft of, on state waters .....	III				45
New York, steam craft of, on United States waters .....	V, VI				46, 47, 53
New York city, names of steamers (in 1820) in service at .....					17
New York city, number and tonnage of steamers constructed at .....	Table.				20, 21
New York, port of, names of steamship lines of the, in 1851 .....	Table.				19
Nicaragua Transit Company, losses of .....					25
Niles' New York Register cited, in relation to the trip of the Savannah .....					18
Norfolk, first steamboat built at .....					17
Norfolk, names of steamers (in 1820) in service at .....					17
North Carolina, merchant tonnage of .....	VII				60, 61
North Carolina, steam craft of, on United States waters .....	V, VI				47, 57
Northern lakes, commerce and building on .....	Table.				11, 12
Northern lakes, steam tonnage of the .....	Table.				11

	Table.	Page.		Table.	Page.
<b>O.</b>			<b>S.</b>		
Ocean steam navigation, remarks on .....		18	Sacramento, names, tonnage, and value of steamers running to and from, in 1853.	Table.	23
Officers and crew, number of, in 1851 .....	Table.	7	Sacramento river, steam navigation on the .....		22-24
Ohio and Mississippi rivers, commerce on .....	Tables.	12-17	Sailing vessels, competition of, with steamers .....		10
Ohio, merchant tonnage of .....	VII	60, 61	Sailing vessels, number, tonnage, and value of .....	VII	60
Ohio, steam craft of, on United States waters .....	V, VI	46, 51	Saint Lawrence, where built .....		10
Ohio river, wages on a 500-ton steamer on the .....	Table.	38	Saint Louis, names and tonnage of steamboats at, in 1845 .....	Table.	15
Ontario, description of the steamers .....		10, 11	Saint Louis, statistics and fur trade of .....		14
Oregon, history of steam navigation in .....		27	Saint Louis, steamboat arrivals at, in 1845 .....	Tables.	15, 16
Oregon, merchant tonnage of .....	VII	60, 61	Saint Paul, steamboat arrivals at, from 1844 to 1856 .....	Tables.	16, 17
Oregon, steam craft of, on United States waters .....	V, VI	47, 58	Sandford, Captain M., operations of .....		9, 10
Oregon Railway and Navigation Company, character of its operations.		30	Sandusky, route of the steamer .....		9
Oregon Steam Navigation Company, operations of the .....		28-30	San Francisco, names, dates of construction, and tonnage of steamers inspected at, in 1860.	Table.	26
Orleans, first voyage of the steamer .....		12	San Francisco, number and tonnage of steamers inspected annually at, from 1855 to 1880.	Table.	25
Ornsbee, Elijah, experiment of .....		3	Savannah, first steamboat built at .....		17
<b>P.</b>			Savannah, first steamer to cross the Atlantic .....		18
Pacific coast, commerce, construction, inspection, etc., on the .....	Tables.	22-31	Savannah, name and tonnage of steamboat (in 1820) in service at.		17
Pacific coast trade, first steamboat to enter the .....		24	Schaffer, John, remarks by, on fuel .....		37
Pacific coast trade, steamers lost belonging to companies engaged in the.		25	Scotland, first experiments made in .....		3
Pacific Mail Company, operations of the .....		24, 25	Sea voyage, first, made by the Phoenix .....		4
Paragon, construction of the steamer .....		4	Secretary of the Treasury, report of the, in 1838 .....	Tables.	5, 6
Passengers, number carried in the United States .....	I-VI	44-59	Secretary of the Treasury, report of the, in 1851 .....	Tables.	6, 7
Passengers, number of ferry .....		32	Senator, earnings of the steamer .....		22
Passengers, number of lives lost .....		32	Sheldon Thompson, first trip of the .....		12
Passengers, number of regular .....		32	Snake and Upper Columbia rivers, construction on the .....		29
Passengers (see summary for each group) .....		32-43	Sophia, when and where launched .....		11
Passenger steamers, average tonnage, value, and crew of .....	Table.	33	South Carolina, merchant tonnage of .....	VII	60, 61
Passenger traffic .....	I-VI	44-59	South Carolina, steam craft of, on United States waters .....	V, VI	47, 57
Patent, description of the steamer .....		9	Southerner, first regular ocean mail steamer to Charleston .....		18
Pennsylvania, canal interests of .....	IV	45	Starr, Jehosaphat, patent issued to .....		1
Pennsylvania, merchant tonnage of .....	VII	60, 61	State interests .....	VI	48-59
Pennsylvania, steam craft of, on state waters .....	III	45	State waters .....	III	45
Pennsylvania, steam craft of, on United States waters .....	V, VI	46, 47, 54	Statistical tables .....	I-VII	44-62
Penobscot, first trip of the steamer, on the "outside route" .....		10	Steamboats, number, tonnage, and value of .....	VII	60
People's Transportation Company, organization of .....		28	Steam craft, number, tonnage, value, etc., of—		
Philadelphia, first steamboat built at .....		17	Gulf of Mexico .....	V	47
Philadelphia, names of steamers (in 1820) in service at .....		17	Lower Mississippi river .....	V	47
Philadelphia, number and tonnage of steamers constructed at .....	Tables.	20, 21	Middle states .....	V	47
Phoenix, description of the steamer .....		4	New England states .....	V	46
Phoenix, first sea voyage made by the .....		17, 18	Northern lakes .....	V	46
Pittsburgh, coal shipments from .....		38	Ohio river .....	V	46
Pittsburgh, number and tonnage of vessels constructed at .....	Table.	13, 14	Pacific coast .....	V	47
Pittsburgh, transportation interests of .....	Tables.	38, 39	South Atlantic coast .....	V	47
Pittsburgh Times, remarks on the fuel question of western rivers.		39, 40	Upper Mississippi river .....	V	46
Portland, Oregon, steamboats inspected at, from 1862 to 1880 .....	Table.	31	Upper Missouri river .....	V	48
Portland Steam Packet Company, organization of .....		10	United States .....	I, VII	44, 60, 61
Potomac river, first steamer on the .....		18	Steam craft, number, tonnage, value, etc., of—		
Propellers, list of the early, on the lakes .....		12	Alabama .....	VI	56
Puget sound, steamboats inspected at, from 1871 to 1880 .....	Table.	31	Arkansas .....	VI	55
<b>R.</b>			California .....	VI	58
Rafts or flats used on the Ohio and Mississippi rivers .....		12	Connecticut .....	VI	50
Rail lines of the Northern Pacific Railroad Company projected in 1879.		30	Dakota .....	VI	58
Ramsay, David, method of, for constructing ships .....		1	Delaware .....	VI	54
Raritan, date of construction of the .....		4	District of Columbia .....	VI	55
Reading Railroad Company, tonnage, etc., of steamers run by .....	Table.	40	Florida .....	VI	57
Read, Nathan, boat constructed by .....		3	Georgia .....	VI	57
Records of construction .....	Table.	4	Illinois .....	VI	51
Rhode Island, merchant tonnage of .....	VII	60, 61	Indiana .....	VI	53
Rhode Island, steam craft of, on United States waters .....	V, VI	46, 49	Iowa .....	VI	52
Richmond, construction of the steamer .....		4	Kentucky .....	VI	52
River tugs, when the service was first inaugurated .....		12	Louisiana .....	VI	56
Rooseveltdt, Nicholas L., experiment of .....		3	Maine .....	VI	48
Roustabouts, number employed .....	I, II, V, VI	32, 44-59	Maryland .....	VI	55
Roustabouts (see summary for each group) .....		34-43	Massachusetts .....	VI	49
Rumsey, James, invention and experiment of .....		1-3	Michigan .....	VI	50
Rumsey, James, publications of .....		2	Minnesota .....	VI	51
			Mississippi .....	VI	56
			Missouri .....	VI	52

	Table.	Page.		Table.	Page.
Steam craft, number, tonnage, value, etc., of—continued.			Texas, merchant tonnage of .....	VII	60, 61
Nebraska .....	VI	59	Texas, steam craft of, on United States waters .....	V, VI	47, 56
New Hampshire .....	VI	48	Thornton, Dr. William, patent issued to .....		1
New Jersey .....	VI	54	Tonnage of steamers .....	I-VIII	44-62
New York .....	VI	53	Tonnage of steamers ( <i>see</i> summary for each group) .....		34-43
North Carolina .....	VI	57	Toogood, Thomas, method of propulsion patented by .....		1
Ohio .....	VI	51	Towing-steamers, average tonnage, value, and crew of .....	Table.	33
Oregon .....	VI	58	Transmittal, letter of .....		V
Pennsylvania .....	VI	54	Tugs, river, when service first inaugurated .....		12
Rhode Island .....	VI	49			
South Carolina .....	VI	57	<b>U.</b>		
Tennessee .....	VI	55	Upper Columbia and Snake rivers, construction on the .....		29
Texas .....	VI	56	Upper Mississippi, navigation of the .....		14
Vermont .....	VI	49	Upper Missouri, construction on the .....		21
Virginia .....	VI	57	Upper Missouri, first steamboat on the .....		21
Washington territory .....	VI	58	Upper Missouri, wages and service of a 500-ton steamer on the .....	Table.	43
West Virginia .....	VI	52	Upper Willamette, construction on the .....		28
Wisconsin .....	VI	50	United Kingdom, steam tonnage of the, compared with that of the United States .....	Table.	8
Steam vessels, number and tonnage of, constructed at—			United States and foreign tonnage .....	Table.	7
Baltimore .....	Table.	20, 21	United States interests .....	I	44
Cincinnati .....	Table.	13, 14	United States Mail Steamship Company, losses sustained by .....		25
Louisville .....	Table.	13, 14	United States, number of steam vessels in .....	I	44
New York .....	Table.	20, 21	United States, steam tonnage owned by government of .....	VIII	62
Philadelphia .....	Table.	20, 21	United States, steam tonnage of, compared with that of the United Kingdom .....	Table.	8
Pittsburgh .....	Table.	13, 14	United States waters, number, tonnage, and traffic of steamers on .....	II	44, 45
Steam vessels, number and tonnage of, constructed on—					
Atlantic coast .....	Table.	20, 21	<b>V.</b>		
Northern lakes .....	Table.	11	Value of steamers in the United States .....	I-VII	44-61
Pacific coast .....	Table.	26	Value of steamers in the United States ( <i>see</i> summary for each group) .....		34-43
Western rivers .....	Table.	13, 14	Vanderbilt, Cornelius, operations of, on New England waters .....		9, 10
Steam vessels, number, tonnage, etc., of, in 1838 .....	Table.	5	Vermont, merchant tonnage of .....	VII	60, 61
Steam vessels, number, tonnage, etc., of, in 1851 .....	Table.	7	Vermont, steam craft of, on state waters .....	III	45
Steam vessels, number, tonnage, etc., of, inspected annually .....	Table.	7	Vermont, steam craft of, on United States waters .....	V, VI	46, 49
Steam vessels, number, tonnage, etc., of, inspected at Portland, Oregon .....	Table.	31	Vesuvius, construction of the steamer .....		4
Steam vessels, number, tonnage, etc., of, inspected at San Francisco, California .....	Tables.	25, 26	Virginia, merchant tonnage of .....	VII	60, 61
Steam vessels, number, tonnage, etc., of, inspected on Pacific coast .....	Table.	25	Virginia, steam craft of, on United States waters .....	V, VI	47, 57
Steam vessels, number, tonnage, etc., of, in the United States .....	I, VII	22, 44, 60, 61	<b>W.</b>		
Steam vessels, number, tonnage, etc., of, on the northern lakes in 1855 .....		12	Wages paid to crews on vessels in the United States .....	I-VI	44-50
Steam vessels, number, tonnage, etc., of, owned by United States government .....	VIII	62	Wages paid to crews ( <i>see</i> summary for each group) .....		34-43
Steam vessels, number, tonnage, traffic, etc., of, on United States waters .....	II	44, 45	Walk-in-the-water, description of the steamer .....		11
Stevens, John, patent issued to, and experiments of .....		1-3	Washington city, first steamboat built at .....		17
Stevens, Robert L., first ocean trip with the Phoenix .....		17, 18	Washington city, names of steamers (in 1820) in service at .....		17
Summary of steam-navigation interests of the United States .....		32, 34	Washington, first steamer on the Potomac .....		18
Summary of tonnage and traffic—			Washington, General, certificate issued by, to Rumsey .....		2
Gulf states, Group VII .....		42	Washington territory, merchant tonnage of .....	VII	60, 61
Lower Mississippi, Group VI .....		41	Washington territory, steam craft of, on United States waters .....	V, VI	47, 58
Middle states, Group V .....		40	West, Edward, patent issued to .....		1
New England states, Group I .....		34	Western rivers, number and tonnage of vessels constructed on .....	Table.	13, 14
Northern lakes, Group II .....		35, 36	West Virginia, merchant tonnage of .....	VII	60, 61
Ohio river, Group IV .....		37-40	West Virginia, steam craft of, on United States waters .....	V, VI	46, 52
Pacific coast, Group IX .....		42	Wharf-boats, number, tonnage, and value of .....	VII	61
South Atlantic coast, Group VIII .....		42	Willamette Lock and Transportation Company, formation of .....		28
Upper Mississippi river, Group III .....		36, 37	Willamette river, description of, and operations on .....		27, 28
Upper Missouri river, Group X .....		42, 43	William Jenkins, building of the steamer .....		10
Summary of tonnage of the United States .....		62	Wisconsin, merchant tonnage of .....	VII	60, 61
Symington, William, construction of the Charlotte Dundas by .....		3	Wisconsin, steam craft of, on state waters .....	III	45
			Wisconsin, steam craft of, on United States waters .....	V, VI	46, 50
<b>T.</b>			Wood, amount consumed on vessels in the United States .....	I-VI	44-50
Tennessee, merchant tonnage of .....	VII	60, 61	Worcester, Marquis of, method of propulsion patented by .....		1
Tennessee, steam craft of, on United States waters .....	V, VI	47, 55	<b>Y.</b>		
			Yachts, steam, average tonnage and value of .....	Table.	34