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No. 171.

WASHINGTON, D. C.

March 15, 1892.

TRANSPORTATION.—RAILWAY STATISTICS.

GROUP IX: LOUISIANA, TEXAS, AND PART OF NEW MEXICO.

DEPARTMENT OF THE INTERIOR,

CENSUS OFFICE,

WASHINGTON, D. C., March 1, 1892.

The statistics in this bulletin furnish an exhibit of the operations of railways for the years 1880 to 1889, inclusive, for the state of Louisiana, the state of Texas, excepting a few square miles in the northern part, and that portion of the territory of New Mexico lying south of a line drawn from Santa Fe eastward to the southwestern corner of Indian territory and east of a line drawn southward to El Paso. These statistics were collected by Mr. W. W. MAYBERRY, special agent, under the direction of Mr. HENRY C. ADAMS, special agent in charge of the Division of Transportation.

The following summary presents certain items of interest pertaining to the business of transportation in that portion of the territory covered by this bulletin for the years 1880 and 1889:

ITEMS.	1880.	1889.
Number of passengers carried	5,547,103	994,558
Number of passengers carried 1 mile	263,237,176	57,997,856
Tons of freight moved	8,468,779	2,679,774
Tons of freight moved 1 mile	1,797,191,566	313,336,762
Earnings from passenger service	\$8,669,043.10	\$2,579,463.92
Earnings from freight service	\$27,315,187.85	\$10,572,806.48
Total earnings and income	\$37,027,072.28	\$13,272,639.39
Total expenditures	\$36,473,862.37	\$11,189,361.10
Length in miles of all lines operated	8,846.92	3,084.01
Total number of employés	28,138	2,951
Number of cars in passenger service	727	251
Number of cars in freight service	25,262	6,497
Number of locomotives	994	344
Number of stations on all lines	969	268
Receipts per mile per passenger (cents)	2.494	3.896
Receipts per mile per ton of freight (cents)	1.323	3.374

There are 7 tables appended to the text of this bulletin, which exhibit for each of the 10 years ending 1889 the mileage, equipment and stations, employés, business done, earnings and income, expenditures, and operating expenses.



Superintendent of Census.

TRANSPORTATION OF RAILWAYS IN GROUP IX.

STATISTICS FOR THE 10 YEARS ENDING 1889.

BY HENRY C. ADAMS.

This is the ninth of a series of 10 bulletins in process of publication by the Census Office giving in statistical form the operations of railways in the United States for the years 1880 to 1889, inclusive. The bulletins in this series already issued are, for Group I, No. 46; for Group II, No. 115; for Group III, No. 120; for Group IV, No. 149; for Group V, No. 151; for Group VI, No. 155; for Group VII, No. 160; for Group VIII, No. 164.

The territory covered by this bulletin embraces the state of Louisiana, the state of Texas, excepting a few square miles in the northern part, and that portion of the territory of New Mexico lying south of a line drawn from Santa Fe eastward to the southwestern corner of Indian territory and east of a line drawn southward to El Paso. Santa Fe and El Paso were chosen as marking the boundary line because they are the operating termini for certain important railway lines. It is interesting to notice that separate statistics of operations are easily obtained for railways in Texas on account of a law of the state which requires the recognition of state boundaries in all matters of administration. The titles of the tables immediately following the text are:

- Table I. Mileage.
- Table II. Equipment and stations.
- Table III. Employés.
- Table IV. Business done.
- Table V. Earnings and income.
- Table VI. Expenditures.
- Table VII. Operating expenses.

As yet traffic in Group IX can not be said to have developed sufficiently to present any characteristic feature. Certain transcontinental lines lie within this territory, but the most important railway traffic is in a northerly and southerly direction. Railway traffic in this group is influenced by water transportation on the Mississippi river and by the fact that there is a growing export trade from ports on the Gulf of Mexico.

TABLE I—MILEAGE.—This table shows the length of line (single track), the length of operated line, the length of operated line owned by operating companies, the length of operated line leased by operating companies from subsidiary companies, and the length of line operated under trackage rights.

The statistics presented in this table are statistics regulated by operating companies and not by subsidiary or financial companies.

The length of line (single track) in 1880 was 3,084.04 and in 1889 8,755.92 miles, showing an increase in railway mileage during the 9 years ending 1889 of 183.91 per cent. In Group VIII, that is, in the states of Arkansas, southern Missouri, Kansas, and Colorado, the abnormal increase in railway mileage took place in 1887 and 1888. In the territory covered by this bulletin the abnormal increase occurred in 1881 and 1882, the increase in mileage in 1881 being 1,015.67 miles, or 32.93 per cent, and in 1882 2,415.64 miles, or 58.92 per cent.

Reference to Table I further discloses a marked tendency toward consolidation by means of leases. Thus, in 1880 but 39 miles of railway were leased for the purpose of operation, while in

1889 1,783.26 miles were leased for the same purpose. The year in which the major portion of these leases was taken was 1885, although the years 1886 and 1889 show marked increase in consolidation by leases.

TABLE II—EQUIPMENT AND STATIONS.—In this table there appears a statement of the number of passenger and freight locomotives and the number of cars in passenger and freight service in Group IX. There is also given a statement of the number of stations on the line.

TABLE III—EMPLOYÉS.—This table shows the total number of men employed on railways in the territory covered by the bulletin, analyzed so as to show the number engaged in the maintenance of way and structure, the maintenance of equipment, in conducting transportation, and in general administration.

Following the pattern set in the previous bulletins of this series, there is inserted below an assignment of equipment to length of line operated and to the amount of traffic carried for each of the 10 years ending 1889.

ASSIGNMENT OF EQUIPMENT TO LENGTH OF LINE OPERATED AND AMOUNT OF TRAFFIC CARRIED FOR 10 YEARS, 1880 TO 1889, INCLUSIVE.

ASSIGNMENTS.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	For all roads in the United States for 1889.
Engines per 100 miles of line	12	12	10	11	11	11	11	11	11	11	11
Freight engines per 100 miles of line	7	7	6	7	7	7	7	7	7	8	10
Passenger engines per 100 miles of line	3	3	2	3	3	3	3	3	3	3	1
Cars in freight service per 100 miles of line	234	278	268	255	257	260	265	275	285	286	55
Cars in passenger service per 100 miles of line	9	9	8	8	8	8	8	8	8	8	1
Tons freight carried per freight engine	13,354	13,623	13,022	10,318	11,073	10,569	11,906	13,436	13,272	14,186	35,64
Ton miles per freight engine	1,566,684	1,957,276	1,980,541	2,024,841	1,930,059	1,661,154	2,387,505	2,635,651	2,870,043	3,141,786	4,538,78
Passengers carried per passenger engine	11,565	14,780	15,542	20,203	18,269	14,812	17,314	20,054	22,343	27,192	58,44
Passenger miles per passenger engine	669,859	764,428	909,248	1,153,827	1,022,535	815,539	1,001,518	1,114,025	1,187,131	1,309,638	1,430,10
Freight cars per 1,000,000 tons freight carried	2,416	2,845	3,268	3,461	3,256	3,498	3,019	2,876	2,996	2,686	1,51
Passenger cars per 1,000,000 passengers carried	245	189	212	152	153	178	161	146	137	115	1

The design of the above summary is to throw light upon the question of economy in the use of equipment. Whether we consider passenger traffic or freight traffic per engine, the above figures indicate a satisfactory development of railway economy. Thus, in 1880 the number of ton miles per freight engine was 1,566,684, and in 1889 it was 3,141,786. The number of passenger miles per passenger engine in 1880 was 669,859 and in 1889 1,309,638. The efficiency of engines in passenger and freight traffic on the railways in Group IX stands below the average efficiency of all the railways in the United States.

The 2 summaries following are designed to throw light upon the question of economy of labor, and this is done by assigning the number of employés to the length of line operated and to the amount of passenger and freight traffic for which the employment of 1 man in "conducting transportation" is necessary.

NUMBER OF EMPLOYÉS PER 100 MILES OF LINE OPERATED FOR 10 YEARS, 1880 TO 1889, INCLUSIVE.

CLASSIFICATION.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
Total	252	305	278	286	258	283	324	317	318	
Maintenance of way and structures	108	131	133	125	117	114	138	133	126	
Maintenance of equipment	43	71	42	51	44	50	55	59	62	
Conducting transportation	87	146	92	98	86	100	112	106	110	
General administration	14	14	11	12	11	19	19	19	20	

AMOUNT OF TRAFFIC FOR WHICH EMPLOYMENT OF 1 MAN ASSIGNED TO "CONDUCTING
TRANSPORTATION" IS NECESSARY.

NATURE OF TRAFFIC.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
Tons of freight carried	1,111	669	891	750	910	744	781	899	863	967
Tons of freight carried 1 mile	130,340	96,017	135,280	147,155	158,208	116,892	156,742	176,184	186,678	200,838
Passengers carried	414	368	402	539	605	441	455	514	542	612
Passengers carried 1 mile	23,963	15,950	23,488	30,975	33,884	24,300	26,327	28,499	28,758	29,419

From the first of the preceding summaries it appears that the number of railway employes per 100 miles of line has increased from 252 in 1880 to 322 in 1889, or, if we confine our attention to employes engaged in "conducting transportation", the number has increased from 87 in 1880 per 100 miles of line to 117 in 1889. This tendency is different from that to be observed in most of the other groups, and is doubtless due to the increase in railway mileage in a comparatively undeveloped territory. In the territory covered by Group IX, as well as in the territory covered by Groups VI and VII, railways are built in large measure for the purpose of gaining control in the territory which, when it shall have been developed, will become a source of revenue to the railways. On this account it can not be said that, from the facts referred to, there was less economy in railway labor in 1889 than there was in 1880. That this conclusion is correct may be seen by reference to the second of the above summaries, which shows an increase in efficiency in conducting transportation. Thus, in 1880 the number of tons carried 1 mile per employe assigned to "conducting transportation" was 130,340, and in 1889 it had increased to 200,838. The number of passengers carried 1 mile, measured in the same way, also increased from 23,963 in 1880 to 29,419 in 1889. A comparison of these two classes of facts shows that, while mileage has increased more rapidly than employes, business done has increased at a yet more rapid rate.

TABLE IV.—BUSINESS DONE.—In this table there is given the amount of business done by railways in Group IX. It shows the number of tons moved, the number of tons moved 1 mile, the number of passengers carried, the number of passengers carried 1 mile, freight train mileage, passenger train mileage, and all other mileage.

By referring directly to the table it will be observed that the number of tons carried has increased from 2,670,774 in 1880 to 8,468,770 in 1889, being an increase of 217.09 per cent. On the other hand, ton mileage has increased from 313,336,762 ton miles in 1880 to 1,797,101,566 ton miles in 1889, being an increase of 473.54 per cent. A comparison of these items shows that ton mileage has increased at a much more rapid rate than the number of tons of freight moved. From this one properly concludes that the major part of railway development in the territory covered by this report so far as freight traffic is concerned is of the nature of through traffic.

The development of passenger traffic is in an opposite direction. The number of passengers carried in 1880 was 994,558 and in 1889 5,547,103, being an increase of 457.75 per cent. On the other hand, the number of passengers carried 1 mile increased from 57,607,856 in 1880 to 263,237,176 in 1889, showing an increase of 356.95 per cent.

A comparison of these items indicates that local passenger traffic has developed somewhat. To provide for the increase of 473.54 per cent in freight traffic it appears necessary to have increased freight train mileage by 91.66 per cent, and to provide for the percentage increase of 356.95 per cent in the number of passengers carried 1 mile passenger train mileage was increased by 235.65 per cent.

This comparison suggests the nature of the economy of railways in Group IX, since it indicates a marked increase in the average size and weight of trains and a satisfactory increase in the average load carried by passenger trains.

TABLE V.—EARNINGS AND INCOME.—This table exhibits the earnings from freight traffic, earnings from passenger traffic, and the income from fixed investments. It also shows the per cent of operating expenses to earnings from operation.

Turning to the table, it is observed that earnings from freight service increased from \$10,572,806.48 in 1880 to \$27,315,187.85 in 1889, showing a total increase of 158.35 per cent. On the other hand, the earnings from passenger service show an increase of 236.08 per cent, the passenger

earnings in 1889 being \$8,669,043.10. If the percentage increase in earnings from operation be compared with the percentage increase in business done, it will be observed that earnings have not increased at a rate commensurate with the business transacted.

In the following summary earnings from freight service and from passenger service and gross earnings from operation are assigned to mile of line.

EARNINGS FROM FREIGHT AND PASSENGER SERVICE ASSIGNED TO MILEAGE OF OPERATED LINE.

EARNINGS.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
From freight service per mile of line	\$1,838.32	\$3,547.50	\$2,969.86	\$3,268.28	\$2,793.72	\$2,392.62	\$2,596.31	\$2,616.98	\$2,668.26	\$3,123.27
From passenger service per mile of line	936.44	1,011.62	937.70	1,092.74	1,045.04	891.66	926.50	906.65	914.32	901.23
Gross earnings from operation per mile of line ..	4,774.76	4,559.12	3,898.56	4,361.02	3,838.76	3,284.28	3,522.81	3,522.63	3,582.58	4,114.50

From the above summary it appears that the gross earnings per mile of line on the railways in Group IX, notwithstanding the marked increase in traffic, fell from \$4,774.76 in 1880 to \$4,114.50 in 1889. The lightest earnings during the period covered by the report appear in 1885, when the gross earnings per mile of line were \$3,284.28. The only explanation of the decrease in receipts at the same time that business done has increased is found in the reduction in charges for traffic.

The following summary shows the receipts per ton per mile and the receipts per passenger per mile for each of the 10 years ending 1889:

RECEIPTS PER MILE FROM FREIGHT AND PASSENGERS.

YEARS.	Receipts per mile per ton moved.	Receipts per mile per passenger carried. (a)
	<i>Cents.</i>	<i>Cents.</i>
1880.....	3.374	3.896
1881.....	2.526	3.773
1882.....	2.374	3.767
1883.....	2.250	3.118
1884.....	2.039	3.098
1885.....	2.053	3.199
1886.....	1.474	2.725
1887.....	1.396	2.602
1888.....	1.299	2.513
1889.....	1.323	2.494

a Deduct 13 per cent from passenger earnings for mail and express.

The above figures show a decrease in freight receipts from 3.374 cents per ton mile in 1880 to 1.323 cents in 1889. The lowest point reached appears to be in 1888, when the receipts per ton per mile were 1.299 cents. The reduction in receipts per passenger per mile also has been quite marked, but in neither passenger nor freight traffic have the rates on the railways in Group IX come down to the average rates on all railways in the United States. Thus, the average receipts per passenger per mile on all railways in 1889 were 2.165 cents, while the receipts per ton per mile were 0.922 cent.

TABLE VI—EXPENDITURES.—There is shown in this table the total expenditures incurred by operating companies, classified as operating expenses, interest on funded debt, rentals, and dividends. The table also gives a statement of the surpluses and deficits resulting from each year's operations.

A comparison of Table VI with Table V shows that operating expenses have increased at a more rapid rate than has income from operations. Thus, the gross income from operations during the 9 years covered by the report increased 173.60 per cent, while operating expenses increased 250.83 per cent. It is to be observed, however, that the actual increase in gross income exceeds the actual increase in operating expenses, it being in the former \$22,831,960.55, and in the latter \$19,285,865.44. The percentages, however, are the significant figures, as indicating the tendency of railway business.

The data pertaining to the other items of expenditure are interesting. The interest on funded debt has increased from \$2,903,750.55 in 1880 to \$7,687,200.31 in 1889, being an increase of 164.73 per cent. This shows the increase in operating expenses to have proceeded at a more rapid rate than the increase in interest on funded debt. Rentals have increased from \$7,076.93 in 1880 to \$394,238.60 in 1889, and taxes from \$150,286.80 in 1880 to \$833,263.94 in 1889, being a percentage increase in the latter case of 454.45 per cent. No percentage statement can be made in the matter of dividends, since in 5 of the 10 years covered by the report no dividends were paid. The total amount of dividends paid during the period was but \$886,236.37.

TABLE VII—OPERATING EXPENSES.—This table gives an analysis of operating expenses, classified as expenses incurred in maintenance of way and structure, maintenance of equipment, conducting transportation, and general expenses.

There is given below a consolidated income account for all the railways in Group IX covering the 10 years ending 1889. There is also shown a statement of several items making up an income account assigned on a mileage basis, reduced so as to allow comparison with annual earnings and expenditures.

INCOME ACCOUNT OF RAILWAYS IN GROUP IX, COVERING THE OPERATIONS OF THE 10 YEARS ENDING 1889.

ITEMS.	Amount.	Total	Per mile of line, reduced for comparison with annual earnings.
Gross earnings from operation.....	\$245,028,988.44		89.841.59
Less operating expenses.....	165,071,655.59		2,901.42
Income from operation.....		\$79,957,332.84	639.97
Income from other sources.....		11,966,961.63	187.61
Total income.....		91,924,294.47	1,127.58
Deductions from income:			
Interest on funded debt.....	68,260,352.88		1,079.14
Rentals.....	2,369,116.48		37.14
Taxes.....	4,627,573.16		72.55
Miscellaneous.....	6,099,507.08		97.62
Total deductions from income.....		81,356,549.60	1,276.45
Deficit.....		9,432,285.03	147.87
Dividends.....		886,236.37	13.89
Deficit from operations for the 10 years ending 1889.		10,318,521.40	161.76

From the data given in the above summary the valuation of railway property considered as a source of income to the persons furnishing capital may be estimated. If the interest on funded debt, rentals, and dividends per mile of line be added, it appears that the average payment on railway capital amounts to \$1,121.17. This capitalized at 5 per cent shows the value of railway property considered as an investment to be \$22,423.40 per mile of line. The amount of bonds and stock actually issued by railways shows an actual capitalization of \$48,048 per mile of line.

The final summary in this bulletin assigns the various items of expenditures to length of line for each of the 10 years ending 1889:

EXPENDITURES ASSIGNED TO MILE OF OPERATED LINE.

ITEMS.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
Operating expenses	\$2,791.31	\$3,138.40	\$2,785.75	\$3,107.09	\$3,000.07	\$2,418.01	\$2,818.83	\$2,870.79	\$2,951.68	\$3,084.32
Interest	1,031.17	1,131.71	996.07	1,225.34	1,249.41	1,188.08	1,040.01	963.70	1,094.16	878.97
Rentals	2.79	6.78	22.02	19.03	37.72	46.59	51.10	48.47	44.29	45.08
Taxes	51.56	33.54	40.51	68.50	67.17	44.15	97.06	91.50	82.39	95.28
Dividends		149.89			60.29			0.25	0.17	0.22
Total expenditures, including miscellaneous.	4,902.15	4,660.90	3,873.72	4,499.69	4,585.19	3,787.11	4,071.63	4,086.81	4,270.99	4,170.48

The facts presented in this summary, as also other facts contained in this bulletin, will be placed in comparison with corresponding facts for the other territorial groups in the final report.

TABLE I.—MILEAGE.

ANALYSIS OF MILEAGE.	FOR 9 YEARS ENDING 1889.									
	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
LENGTH OF LINE (SINGLE TRACE):										
Total mileage.....	3,084.04	4,099.71	6,515.35	6,720.41	6,841.37	7,238.59	7,580.25	8,314.81	8,593.72	8,765.92
Increased mileage.....		1,018.67	2,445.64	214.06	111.06	397.22	351.66	724.56	278.91	102.20
Per cent of increase.....		32.93	38.92	3.29	1.66	5.81	4.86	9.55	3.35	1.89
Decreased mileage.....										
Per cent of decrease.....										
LINE OPERATED:										
Total mileage.....	3,084.04	4,099.71	6,065.35	6,820.41	6,932.37	7,329.59	7,681.25	8,405.81	8,684.72	8,846.92
Increased mileage.....		1,018.67	2,506.94	214.06	111.06	397.22	351.66	724.56	278.91	162.20
Per cent of increase.....		32.93	61.14	3.24	1.64	5.73	4.80	9.43	3.32	1.87
Decreased mileage.....										
Per cent of decrease.....										
OPERATED LINE OWNED BY OPERATING COMPANIES:										
Total mileage.....	3,045.04	4,060.71	6,482.35	6,697.41	6,809.34	5,549.22	5,853.80	6,588.75	6,867.66	6,972.66
Increased mileage.....		1,018.67	2,421.64	213.06	111.93		304.58	734.95	278.91	105.00
Per cent of increase.....		33.36	59.64	3.32	1.67		5.49	12.56	4.23	1.53
Decreased mileage.....						1,260.12				
Per cent of decrease.....						18.51				
OPERATED LINE LEASED OR OTHERWISE CONTROLLED BY OPERATING COMPANIES:										
Total mileage.....	39.00	39.00	33.00	32.00	32.03	1,689.37	1,736.45	1,726.06	1,726.06	1,788.26
Increased mileage.....					0.03	47.08	47.08			57.20
Per cent of increase.....					0.09	5,174.34	2.79			3.31
Decreased mileage.....										
Per cent of decrease.....										
LINE OPERATED UNDER TRackage RIGHTS:										
Total mileage.....			91.00	91.00	91.00	91.00	91.00	91.00	91.00	91.00
Increased mileage.....										
Per cent of increase.....										
Decreased mileage.....										
Per cent of decrease.....										

TABLE II.—EQUIPMENT AND STATIONS.

ANALYSIS OF EQUIPMENT AND STATIONS.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	FOR 4 YEARS ENDING 1889.
LOCOMOTIVES	344	450	559	715	756	780	861	947	944	964	
Freight	296	379	375	467	472	501	564	546	620	663	
Passenger	88	119	142	172	161	212	226	258	251	233	
Switching	50	52	42	76	23	67	71	43	73	68	
Increase		106	129	136	21	41	54	13	37	50	650
Per cent of increase		30.81	28.67	23.49	2.94	5.98	10.71	4.38	4.08	5.20	188.35
Decrease											
Per cent of decrease											
CARS IN PASSENGER SERVICE	251	352	468	629	582	558	629	670	709	727	
Ordinary	174	230	329	347	336	261	405	435	472	461	
Sleeping	4	4	20	20	28	15	14	14	19	23	
Factor	2	3	2	2	2	2	2	2	2	2	
Parlor	39	81	69	81	94	89	102	110	116	117	
Baggage	11	12	24	29	30	41	43	40	42	46	
Express	11	23	24	24	42	50	65	67	69	68	
Freight	21	81	136	58	71	71	71	71	39	18	476
Increase		82.27	40.96	12.39	1.14	4.89	12.72	6.52	5.82	2.54	186.64
Per cent of increase											
Decrease											
Per cent of decrease											
CARS IN FREIGHT SERVICE	6,637	10,806	15,963	16,678	17,040	18,530	20,274	23,050	24,619	25,262	
Box	2,950	4,799	7,238	7,660	7,779	8,328	9,466	10,356	11,164	11,569	
Flat	2,452	4,270	6,555	5,982	6,371	6,241	6,666	7,410	8,210	8,309	
Stock	858	1,271	1,260	2,080	2,137	2,156	2,382	2,760	2,882	2,778	
Coal	139	202	622	601	1,072	1,011	1,298	1,645	1,506	1,623	
Tank	10	39	73	76	74	74	87	103	104	104	
Refrigerator											
Other	228	225	306	379	613	600	765	52	52	51	
Increase		4,169	5,167	715	362	1,400	1,714	2,776	744	775	18,625
Per cent of increase		62.81	47.72	4.48	2.17	8.74	9.41	18.69	1,599	673	280.62
Decrease											
Per cent of decrease											
CARS IN COMPANY'S SERVICE	75	75	77	78	79	10	11	13	14	14	
Increase			2	1	1		1	2	1		
Per cent of increase			2.67	1.30	1.28		10.00	18.18	7.69		
Decrease											
Per cent of decrease											
CARS CONTRIBUTED TO FAST FREIGHT SERVICE.						87.24					81.33
Increase											
Per cent of increase											
Decrease											
Per cent of decrease											
STATIONS ON LINE	268	382	475	554	558	642	731	822	87	969	
Increase		114	93	70	4	84	89	91	87	82	701
Per cent of increase		42.54	24.35	16.63	0.72	15.05	13.86	12.45	7.91	9.24	261.57
Decrease											
Per cent of decrease											
Mileage	251.00	215.85	659.20	289.60	291.60	190.85	27.00	27.00	27.00	27.00	

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF EQUIPMENT AND STATIONS WAS OBTAINABLE.

TABLE III.—EMPLOYEES.

ANALYSIS OF EMPLOYEES,	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	FOR 9 YEARS ENDING 1889.
EMPLOYEES:											
Total	2,461	5,289	8,721	10,487	9,652	13,032	18,439	21,145	26,746	28,188	25,187
Increase		2,828	3,432	1,766		3,370	4,418	2,715	5,001	1,382	95,187
Per cent of increase		79.23	64.89	20.25		34.95	41.64	14.73	26.49	5.20	863.91
Decrease					815						
Per cent of decrease					8.06						
MAINTENANCE OF WAY AND STRUCTURE:											
Total	1,260	1,946	4,165	4,564	4,362	5,264	7,895	8,896	10,663	11,690	10,670
Increase		686	2,219	399		962	2,661	1,011	1,727	1,067	1,070
Per cent of increase		54.44	114.63	9.38		20.68	48.65	12.92	18.45	12.84	846.83
Decrease					246						
Per cent of decrease					4.45						
MAINTENANCE OF EQUIPMENT:											
Total	508	1,028	1,364	1,877	1,632	2,282	3,134	3,954	5,409	4,272	3,764
Increase		520	276	673		650	852	824	1,455	1,408	1,408
Per cent of increase		102.36	26.85	43.84		38.83	37.34	26.16	31.74	10.90	740.34
Decrease					245						
Per cent of decrease					13.65						
CONDUCTING TRANSPORTATION:											
Total	1,022	2,118	2,892	3,606	3,292	4,585	6,300	7,092	9,248	10,955	9,274
Increase		1,096	674	714		1,333	1,805	702	2,156	1,408	1,408
Per cent of increase		107.24	86.54	24.69		41.86	38.37	10.89	30.40	10.90	963.52
Decrease					374						
Per cent of decrease					10.37						
GENERAL ADMINISTRATION:											
Total	161	197	360	440	416	881	1,081	1,263	1,726	1,680	1,519
Increase		36	163	80		182	200	463	463	463	1,519
Per cent of increase		22.36	82.74	22.22		111.78	22.70	16.84	36.66	46	943.48
Decrease					24						
Per cent of decrease					5.45					2.67	

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF EMPLOYEES WAS OBTAINABLE.

	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
Mileage	1,913.04	2,681.47	3,470.18	3,156.86	3,290.88	2,734.63	1,963.63	1,740.13	283.23	121.20

TABLE IV.—BUSINESS DONE.

AMOUNT OF BUSINESS DONE,	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	FOR 9 YEARS ENDING 1889.
TONS OF FREIGHT MOVED:											
Total	2,670,774	3,012,867	4,128,000	3,462,177	4,285,312	4,840,067	5,084,044	7,309,068	7,445,206	8,468,779	5,797,096
Increase		342,093	1,155,133	55,355	323,135	755,355	1,243,377	1,255,024	149,438	1,023,204	13,74
Decrease		12,81	37,01	163,823	8,16	12,96	25,69	20,14	1,87	13,74	217,69
Per cent of decrease				4,02							
TONS OF FREIGHT MOVED 1 MILE:											
Total	313,356,762	432,558,022	617,060,011	767,414,369	725,702,098	740,874,763	1,102,714,820	1,370,538,463	1,541,213,099	1,795,101,505	1,483,764,804
Increase		119,221,260	185,401,989	149,454,568	41,712,501	15,173,655	421,840,067	207,823,642	170,674,636	256,888,467	16,60
Decrease		38,06	42,86	24,19	5,44	2,09	36,94	17,87	12,45	16,60	473,54
Per cent of decrease											
NUMBER OF PASSENGERS CAR- RIED:											
Total	994,568	1,389,334	1,865,020	2,848,061	2,849,908	2,790,407	3,428,145	4,050,639	4,335,549	5,547,163	4,552,645
Increase		394,776	476,085	983,041	1,247	622,738	628,738	622,734	484,610	1,011,534	22,30
Decrease		39,69	34,24	52,74	0,04		22,40	18,17	11,96	22,30	457,75
Per cent of decrease											
NUMBER OF PASSENGERS CAR- RIED 1 MILE:											
Total	57,907,856	71,856,208	107,291,263	161,537,181	155,425,342	154,136,917	195,296,063	221,090,988	237,426,112	263,237,176	205,029,320
Increase		14,248,352	35,435,085	54,245,888	1,247	15,384,035	41,159,146	26,994,035	15,735,114	25,811,064	356,95
Decrease		24,73	49,31	50,56			26,70	13,92	7,10	10,87	
Per cent of decrease											
FREIGHT TRAIN MILEAGE:											
Total	7,526,576	13,022,824	15,486,119	10,433,091	9,050,980	8,876,628	11,045,637	12,098,069	13,018,241	14,425,124	6,808,540
Increase		5,496,249	2,463,295	1,382,101	1,382,101	1,382,101	3,169,069	1,462,432	1,310,172	5,06,883	3,64
Decrease		73,02	18,92	32,63			24,44	14,15	10,39	3,64	91,66
Per cent of decrease											
PASSENGER TRAIN MILEAGE:											
Total	2,280,964	3,635,656	5,012,432	4,692,430	5,069,280	5,370,811	5,096,719	6,985,976	7,814,588	7,488,343	5,257,359
Increase		1,404,671	1,376,777	453,374	806,850	271,531	725,908	889,267	828,482	1,614,588	285,65
Decrease		62,90	37,87	420,002	11,04	5,32	13,62	14,50	11,86	326,015	
Per cent of decrease											
ALL OTHER MILEAGE:											
Total	775,512	893,068	628,906	1,082,280	1,256,130	1,146,803	2,357,612	2,903,128	3,231,040	3,603,306	2,827,884
Increase		117,546	453,374	453,374	173,910	16,07	1,210,809	561,516	321,912	372,256	364,63
Decrease		16,16	264,152	72,09	16,07		105,68	23,39	11,07	11,52	
Per cent of decrease											

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF BUSINESS DONE WAS OBTAINABLE.

Tons of freight moved	329,50	1,019,23	1,579,66	1,449,90	1,493,90	805,48	747,38	763,48	850,58	903,58	
Tons of freight moved 1 mile	329,50	1,019,23	1,579,66	1,449,90	1,493,90	805,48	1,077,38	1,094,08	1,184,18	1,234,18	
Number of passengers carried	426,50	1,019,23	1,579,66	1,449,90	1,493,90	972,48	1,077,38	1,094,08	1,184,18	1,234,18	
Number of passengers carried 1 mile	329,50	1,019,23	1,579,66	1,449,90	1,493,90	805,48	1,077,38	1,094,08	1,184,18	1,234,18	
Freight train mileage	329,50	1,019,23	1,579,66	1,449,90	1,493,90	805,48	845,98	862,08	940,18	990,18	
Passenger train mileage	329,50	1,019,23	1,579,66	1,449,90	1,493,90	805,48	845,98	862,08	940,18	990,18	
All other mileage	329,50	1,019,23	1,579,66	1,449,90	1,493,90	805,48	845,98	862,08	940,18	990,18	

TABLE V.—EARNINGS AND INCOME.

ANALYSIS OF EARNINGS AND INCOME.	FOR YEAR ENDING 1889.									
	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1889.
EARNINGS FROM FREIGHT SERVICE:										
Total.....	\$10,572,806.48	\$12,992,916.57	\$16,012,438.15	\$19,430,090.24	\$16,904,556.78	\$16,192,071.13	\$19,080,006.23	\$21,751,108.74	\$22,903,000.20	\$27,315,167.85
Increase.....	2,420,110.09	3,013,666.58	3,013,666.58	2,824,207.09	2,888,335.10	2,070,202.31	1,151,451.66	2,070,202.31	1,151,451.66	4,412,127.65
Decrease.....	22.89	27.86	27.86	17.00	17.84	17.84	17.84	13.99	5.30	19.26
Per cent of increase.....				17.00	13.03	4.22	17.84	13.99	5.30	19.26
Per cent of decrease.....										
EARNINGS FROM PASSENGER SERVICE:										
Total.....	2,579,463.92	3,705,127.16	5,293,148.15	6,498,572.96	6,323,552.74	6,094,275.09	6,809,082.46	7,538,540.01	7,818,083.08	8,669,043.10
Increase.....	1,125,663.24	1,556,020.99	1,556,020.99	1,237,424.81	1,715,020.22	1,715,020.22	774,807.37	729,407.15	369,536.47	829,457.02
Decrease.....	43.64	42.00	42.00	23.62	2.09	2.09	12.84	10.71	4.11	10.46
Per cent of increase.....				23.62	2.09	2.09	12.84	10.71	4.11	10.46
Per cent of decrease.....										
GROSS EARNINGS FROM OPERATION:										
Total.....	13,152,270.40	16,698,043.73	21,373,631.30	25,928,663.20	23,228,409.62	22,226,346.22	25,889,088.69	29,289,648.75	30,721,143.28	35,984,210.95
Increase.....	3,545,773.33	5,173,587.67	4,061,631.00	4,061,631.00	23,228,409.62	22,226,346.22	3,063,642.47	3,309,609.46	1,461,488.13	5,243,684.67
Decrease.....	28.96	31.60	31.60	18.87	2,706,853.68	1,002,003.30	16.48	13.13	4.99	17.02
Per cent of increase.....				18.87	10.44	4.31	16.48	13.13	4.99	17.02
Per cent of decrease.....										
INCOME FROM ALL OTHER SOURCES:										
Total.....	119,708.99	224,454.03	1,447,975.04	1,823,736.81	1,254,439.16	984,848.74	2,453,211.83	1,619,424.33	965,670.47	1,043,411.33
Increase.....	104,685.04	1,223,621.91	1,223,621.91	375,750.87	569,827.05	269,500.42	1,468,363.09	47,770.86	47,770.86	47,770.86
Decrease.....	87.41	646.11	646.11	25.95	569,827.05	269,500.42	149.10	4.80	4.80	4.80
Per cent of increase.....				25.95	31.22	21.40	149.10	4.80	4.80	4.80
Per cent of decrease.....										
TOTAL EARNINGS AND INCOME:										
Total.....	13,272,039.39	16,922,497.76	23,321,607.24	27,752,399.01	24,482,848.68	23,211,194.96	28,343,300.52	30,909,082.48	31,746,813.75	37,027,622.28
Increase.....	3,650,458.37	6,399,109.48	6,399,109.48	4,437,482.77	24,482,848.68	23,211,194.96	5,132,005.56	2,565,881.96	877,734.27	6,286,855.53
Decrease.....	27.50	37.81	37.81	19.03	3,276,141.33	1,271,053.79	22.11	9.05	2.71	10.63
Per cent of increase.....				19.03	11.80	5.19	22.11	9.05	2.71	10.63
Per cent of decrease.....										
PER CENT OF OPERATING EXPENSES TO EARNINGS:										
Per cent.....	68.46	68.84	71.46	71.26	79.71	73.62	80.02	81.50	82.39	74.96
Increase.....	10.38	2.62	2.62	0.20	8.45	6.09	6.40	1.48	0.89	7.43
Decrease.....										

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF EARNINGS WAS OBTAINABLE.

Mileage.....	320.50	437.15	665.65	873.35	891.35	562.10	332.09	31.10	101.20	101.20
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TABLE VI.—EXPENDITURES.

ANALYSIS OF EXPENDITURES.	1980.	1981.	1982.	1983.	1984.	1985.	1986.	1987.	1988.	1989.	FOR YEARS ENDING 1989.
OPERATING EXPENSES:											
Total	\$7,688,703.32	\$11,494,572.29	\$16,626,994.57	\$19,481,694.02	\$19,516,523.83	\$16,363,823.54	\$20,716,254.65	\$23,869,253.15	\$27,433,763.37	\$26,674,568.76	\$19,283,863.44
Increase		3,805,868.97	4,133,422.28	2,851,093.45	34,929.81	3,163,266.34	4,352,421.11	3,153,266.34	1,405,942.22	1,038,843.39	250.83
Per cent of increase		49.20	55.98	18.24	0.19	20.69	21.11	13.32	5.11	6.47	
Decrease											
Per cent of decrease											
INTEREST ON FUNDED DEBT:											
Total	2,963,750.55	4,134,969.17	5,588,662.24	7,287,142.47	7,560,269.76	8,046,827.26	7,643,483.02	8,012,885.82	9,391,713.28	7,687,260.31	4,783,443.75
Increase		1,271,218.62	1,434,694.07	1,698,480.23	273,067.29	480,127.50	60,296.82	369,427.40	1,378,227.46	11,096.73	386,661.67
Per cent of increase		42.75	51.83	30.39	3.75	6.35	0.93	4.53	17.21	0.13	5,035.37
Decrease											
Per cent of decrease											
BONDS:											
Total	7,676.93	24,837.85	126,917.30	113,184.00	228,255.85	315,275.05	376,572.77	463,015.26	399,141.87	364,298.09	386,661.67
Increase		17,160.92	102,079.45	180,073.12	113,071.35	83,620.00	60,296.82	25,442.40	399,141.87	11,096.73	386,661.67
Per cent of increase		223.54	310.98	79.23	101.67	38.12	19.13	7.31	5.08	0.31	5,035.37
Decrease											
Per cent of decrease											
TAXES:											
Total	189,286.80	122,880.85	227,271.42	407,344.54	406,451.16	298,791.63	713,354.64	769,278.27	767,199.91	820,293.94	682,977.11
Increase			104,460.57	180,073.12	113,071.35	83,620.00	414,263.61	475,428.63	475,428.63	126,064.03	386,661.67
Per cent of increase			55.03	79.23	101.67	43.63	188.75	0.65	0.65	17.83	461.45
Decrease											
Per cent of decrease											
DIVIDENDS:											
Total	516,000.00	516,000.00	516,000.00	516,000.00	364,800.00	364,800.00	364,800.00	2,401.37	1,450.00	1,885.00	1,885.00
Increase											
Per cent of increase											
Decrease											
Per cent of decrease											
TOTAL EXPENDITURES, INCLUDING SURPLUS:											
Total	11,189,361.10	17,263,099.39	21,734,288.33	26,753,977.01	27,745,067.03	25,623,204.36	29,945,480.65	31,989,855.73	36,659,364.90	36,473,862.37	25,284,501.27
Increase		6,073,738.29	4,551,278.34	5,019,688.68	991,040.02	4,035,373.08	4,316,276.29	4,035,373.08	2,678,009.17	2,678,009.17	225.97
Per cent of increase		63.74	26.34	23.10	3.70	13.48	16.84	12.63	7.28	7.88	0.09
Decrease											
Per cent of decrease											
Surplus	2,082,678.29	1,587,318.91	1,605,013.00	1,605,013.00	3,262,218.35	2,418,092.40	1,602,280.13	3,071,723.25	4,012,548.15	553,809.91	10,318,321.40
Deficit											

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF EXPENDITURES WAS OBTAINABLE.

Mileage	329.50	437.15	905.65	873.35	881.35	562.10	332.00	91.10	301.29	101.20	
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TABLE VII.—OPERATING EXPENSES.

ANALYSIS OF OPERATING EXPENSES.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	FOR 9 YEARS ENDING 1889.
MAINTENANCE OF WAY AND STRUCTURE:											
Total	\$2,477,505.26	\$9,865,053.87	\$4,484,796.11	\$5,239,098.56	\$5,180,575.12	\$5,073,070.31	\$6,697,616.52	\$7,495,424.76	\$7,307,680.34	\$8,263,270.46	\$5,785,774.74
Increase		1,888,148.61	719,472.24	754,242.45			1,024,537.21	797,808.24		955,440.06	233.53
Per cent of increase		66.06	18.60	16.46			32.02	11.91		13.07	
Decrease											
Per cent of decrease											
MAINTENANCE OF EQUIPMENT:											
Total	1,316,841.28	2,070,398.92	3,906,328.70	4,698,196.86	4,471,111.63	2,980,214.13	4,207,361.27	4,281,304.25	4,448,685.46	4,657,177.44	3,341,336.16
Increase		754,667.64	1,885,930.47	721,798.07			1,227,147.14	73,042.98	167,391.21	208,481.98	253.93
Per cent of increase		57.34	38.68	18.48			41.18	1.76	3.91	4.69	
Decrease											
Per cent of decrease											
CONDUCTING TRANSPORTATION:											
Total	3,078,244.15	4,727,316.52	9,411,216.85	7,549,505.61	7,841,240.05	7,216,019.47	8,027,848.52	10,513,305.45	11,891,186.75	12,101,462.39	9,023,218.24
Increase		1,649,072.37	1,683,900.33	1,136,288.76	291,794.44		1,411,829.05	1,885,456.93	1,377,881.30	210,275.64	293.13
Per cent of increase		53.57	35.62	11.76	3.86		19.57	21.85	13.11	1.77	
Decrease											
Per cent of decrease											
GENERAL EXPENSES:											
Total	817,172.63	831,202.58	727,722.82	964,822.99	1,014,597.08	1,094,512.63	1,183,428.34	1,579,788.69	1,688,052.82	1,952,649.53	1,135,476.90
Increase		14,030.95		237,170.17	43,704.04	79,915.60	88,915.71	396,380.35	108,264.13	264,598.71	138.95
Per cent of increase		1.72		32.59	5.15	7.88	8.12	33.49	6.85	15.67	
Decrease											
Per cent of decrease											
TOTAL OPERATING EXPENSES:											
Total	7,668,763.32	11,494,572.29	15,629,684.57	18,481,504.02	18,516,523.83	16,363,825.54	20,716,254.65	23,860,823.15	25,336,765.37	29,974,508.76	19,285,865.44
Increase		3,865,808.97	4,135,422.28	2,851,936.45	34,929.81		4,352,429.11	3,163,568.50	1,465,942.22	1,638,833.39	250.83
Per cent of increase		49.50	35.98	18.24	0.19		26.80	15.22	6.14	6.47	
Decrease											
Per cent of decrease											
Mileage	320.50	437.15	665.65	873.35	884.35	562.10	332.00	91.10	101.20	101.20	

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF OPERATING EXPENSES WAS OBTAINABLE.

CENSUS BULLETIN.

No. 172.

WASHINGTON, D. C.

March 16, 1892.

TRANSPORTATION.—RAILWAY STATISTICS.

GROUP X: CALIFORNIA, OREGON, WASHINGTON, IDAHO, AND NEVADA, THE TERRITORIES OF ARIZONA AND UTAH, AND PART OF THE TERRITORY OF NEW MEXICO.

DEPARTMENT OF THE INTERIOR,
CENSUS OFFICE,
WASHINGTON, D. C., March 2, 1892.

The statistics in this bulletin furnish an exhibit of the operations of railways for the years 1880 to 1889, inclusive, for that portion of the United States lying west of the Rocky mountains; that is to say, for the states of California, Oregon, Washington, Idaho, and Nevada, the territories of Arizona and Utah, and that portion of the territory of New Mexico lying west of a line drawn from Santa Fe to El Paso.

These statistics were collected by Mr. W. W. MAYBERRY, special agent, under the direction of Mr. HENRY C. ADAMS, special agent in charge of the Division of Transportation.

A summary of certain items pertaining to the transportation business in the territory covered by this bulletin for the years 1880 and 1889 is herewith presented:

ITEMS.	1889.	1880.
Number of passengers carried	20,466,345	8,642,510
Number of passengers carried 1 mile	761,741,438	239,845,613
Tons of freight moved	10,555,073	2,880,318
Tons of freight moved 1 mile	2,016,543,865	569,719,486
Earnings from passenger service	\$20,414,247.87	\$8,758,082.77
Earnings from freight service	\$38,085,316.07	\$17,651,630.35
Total earnings and income	\$61,442,219.95	\$29,983,487.71
Total expenditures	\$84,090,884.13	\$28,605,111.43
Length in miles of all lines operated	11,164.42	4,388.25
Total number of employes	29,728	9,529
Number of cars in passenger service	1,408	624
Number of cars in freight service	28,248	9,479
Number of locomotives	1,322	470
Number of stations on all lines	1,160	389
Receipts per mile per passenger (cents)	2.314	2.968
Receipts per mile per ton of freight (cents)	1.850	3.162

The 7 tables appended to this bulletin embrace the mileage, equipment and stations, employes, business done, earnings and income, expenditures, and operating expenses.

With the publication of this bulletin there is brought to a close the series of 10 group tables, which in their aggregate give the statistical report of the operations of all the railways of the United States for the years 1880 to 1889, inclusive.

Robert P. Porter
Superintendent of Census.

TRANSPORTATION ON RAILWAYS IN GROUP X.

STATISTICS FOR THE 10 YEARS ENDING 1889.

BY HENRY C. ADAMS.

This is the last of a series of 10 bulletins promised by the Census Office giving in statistical form the operations of railways in the United States for the 10 years 1880 to 1889, inclusive.

The territory covered by this bulletin, and designated as Group X, embraces the states of California, Oregon, Washington, Idaho, and Nevada, the territories of Arizona and Utah, and that portion of the territory of New Mexico lying west of a line drawn from Santa Fe to El Paso. The bulletins in this series already issued are, for Group I, No. 46; for Group II, No. 115; for Group III, No. 120; for Group IV, No. 149; for Group V, No. 151; for Group VI, No. 155; for Group VII, No. 160; for Group VIII, No. 164, and for Group IX, No. 171.

Immediately following the text will be found 7 tables, from which the summaries are derived. The titles of these tables are as follows:

- Table I. Mileage.
- Table II. Equipment and stations.
- Table III. Employés.
- Table IV. Business done.
- Table V. Earnings and income.
- Table VI. Expenditures.
- Table VII. Operating expenses.

Group X extends over a larger territory than any other group in the series. It embraces the western termini of all the transcontinental lines with the single exception of the Canadian Pacific railway, and also the mileage of that enormous railway system known as the Southern Pacific Railway Company. The contractual relations and the commercial conditions of the railways in Group X are in many respects peculiar, and can not be regarded as having adjusted themselves to the form which they will eventually assume.

TABLE I—MILEAGE.—In this table is shown the length of line (single track), length of operated line owned by operating companies, length of operated line leased or otherwise controlled by operating companies, and length of line operated under trackage rights.

The length of line (single track) in 1880, which measures railway mileage in this territory, was 4,388.25 miles, and in 1889 11,150.43 miles, being an increase during the 9 years covered by the report of 154.10 per cent. So far as railway building is concerned Group X seems to have been subject to the same influences as Group IX, the large increase in railway mileage being in the years 1881, 1882, and 1883. As in the case of all other groups, the years 1887 and 1888 show activity in railway extension, but this is by no means marked in Group X.

The railways west of the Rocky mountains are peculiar in the large amount of mileage leased for the purpose of operation. Thus, in 1889, of the total mileage operated, 6,145.59 miles were leased by operating companies, as against 5,004.84 miles directly owned. This suggests that the contractual relations of railways in Group X are somewhat peculiar.

TABLE II—EQUIPMENT AND STATIONS.—In this table will be found a statement of equipment, classified in the ordinary manner, and it shows the number of freight engines, the number of passenger engines, the number of cars in freight service, and the number of cars in passenger service separately.

TABLE III—EMPLOYÉS.—This table shows the total number of men employed on all railways in the territory covered by this bulletin. Employés are classified so as to show the number engaged in maintenance of way and structure, in maintenance of equipment, in conducting transportation, and in general administration.

Following the plan of the previous bulletins, there is here inserted a summary, which assigns equipment to length of line operated and to the amount of traffic carried. In this manner light is thrown upon the question of economy of equipment.

ASSIGNMENT OF EQUIPMENT TO LENGTH OF LINE OPERATED AND AMOUNT OF TRAFFIC CARRIED FOR 10 YEARS, 1880 TO 1889, INCLUSIVE.

ASSIGNMENTS.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	For all roads in the United States for 1889.
Engines per 100 miles of line.....	11	11	12	12	12	11	11	10	11	12	19
Freight engines per 100 miles of line.....	6	6	7	7	7	7	6	6	6	7	10
Passenger engines per 100 miles of line.....	5	5	5	4	4	4	4	4	4	4	5
Cars in freight service per 100 miles of line.....	217	233	273	233	230	219	230	237	251	260	557
Cars in passenger service per 100 miles of line.....	14	14	13	12	12	12	12	12	13	13	17
Tons freight carried per freight engine.....	12,495	11,999	11,461	9,338	9,544	10,166	13,153	15,638	16,911	14,639	35,643
Ton miles per freight engine.....	2,245,460	2,231,580	2,387,280	1,816,469	1,712,699	1,994,172	2,835,290	3,340,978	3,267,918	2,800,755	4,538,786
Passengers carried per passenger engine.....	46,716	40,838	38,353	38,930	38,284	38,645	41,018	44,112	44,522	44,299	58,444
Passenger miles per passenger engine.....	1,325,111	1,235,928	1,247,772	1,317,115	1,290,892	1,238,505	1,530,323	1,674,970	1,744,843	1,666,830	1,430,105
Freight cars per 1,000,000 tons freight carried.....	3,077	3,167	3,554	3,663	3,565	3,286	2,742	2,609	2,364	2,619	1,588
Passenger cars per 1,000,000 passengers carried.....	68	73	72	74	76	78	75	69	69	67	59

The most significant of the computations in the above summary are those which show the number of tons of freight moved 1 mile per freight engine and the number of passengers carried 1 mile per passenger engine. Thus, the number of ton miles accomplished per freight engine in 1880 was 2,245,460 and in 1889 2,800,755. The number of passengers carried 1 mile per passenger engine in 1880 was 1,325,111 and in 1889 1,666,830. These figures do not indicate a marked increase in economy of motive power, which, however, is not to be imputed to the technical administration of railways or to the character of the equipment, but to the fact that the business of transportation in Group X is not sufficiently dense to allow the most perfect adjustment in technical matters. This will be clearly seen if the figures here presented be compared with corresponding figures of any of the groups of railways lying east of the Mississippi river.

The 2 summaries following are designed to indicate the economy of employment. This is done by assigning the number of men employed to length of line operated, and by showing the amount of traffic for which 1 man assigned to "conducting transportation" is necessary in each of the 10 years ending 1889.

NUMBER OF EMPLOYÉS PER 100 MILES OF LINE OPERATED FOR 10 YEARS, 1880 TO 1889, INCLUSIVE.

CLASSIFICATION.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
Total.....	280	312	351	348	254	238	264	277	311	237
Maintenance of way and structures.....	103	114	130	129	102	88	96	106	118	111
Maintenance of equipment.....	50	55	62	66	46	50	53	54	68	68
Conducting transportation.....	100	112	125	125	86	80	93	94	101	111
General administration.....	27	31	34	28	20	20	22	23	26	26

AMOUNT OF TRAFFIC FOR WHICH EMPLOYMENT OF 1 MAN ASSIGNED TO "CONDUCTING TRANSPORTATION" IS NECESSARY.

NATURE OF TRAFFIC.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
Tons of freight carried.....	702	656	614	508	747	830	965	971	1,051	945
Tons of freight carried 1 mile.....	126,513	122,126	127,575	98,857	133,948	162,868	195,159	207,997	203,156	189,905
Passengers carried.....	2,101	1,701	1,493	1,308	1,819	1,897	1,741	1,859	1,874	1,834
Passengers carried 1 mile.....	59,530	51,469	48,596	44,324	61,230	69,856	64,994	79,635	73,419	68,986

From the first of the preceding summaries it appears that there is no marked change in the amount of labor employed per 100 miles of line, the number being 280 in 1880 and 278 in 1889. The number of employes per 100 miles of line on railways in New England in 1889 was 761, and on railways in the middle states 1,138. All figures point clearly to the fact that the territory served by the railways in Group X has not yet developed sufficiently to warrant the most economical organization of railway employes.

The second of these summaries, however, does indicate some advance in economy of labor. Thus, the number of tons of freight carried 1 mile in 1880, for which 1 man engaged in "conducting transportation" is necessary, was 126,513 and in 1889 189,905. In 1887, when the business of transportation was exceptionally good, it was 207,997. Corresponding figures pertaining to passenger traffic indicate also a slight increase in economy. As compared with railways in other groups, however, these figures do not indicate a high degree of economy.

TABLE IV—BUSINESS DONE.—This table, which shows business done on railways in Group X, exhibits the number of tons of freight moved, the number of tons of freight moved 1 mile, the number of passengers carried, the number of passengers carried 1 mile, freight train mileage, passenger train mileage, and all other mileage.

By reference to this table it appears that the number of tons of freight moved has increased from 2,886,318 in 1880 to 10,555,073 in 1889, being an increase of 265.69 per cent. The number of tons of freight moved 1 mile during the same period increased from 509,719,486 in 1880 to 2,016,543,865 in 1889, being an increase of 295.62 per cent. A comparison of these percentages shows a slight increase in long-haul traffic. The number of passengers carried has increased from 8,642,510 in 1880 to 20,466,345 in 1889. The number of passengers carried 1 mile has increased from 239,845,013 in 1880 to 761,741,438 in 1889, being a percentage increase of 217.60. In passenger traffic also a comparison of the above percentages shows an increase in the average journey. In this particular railway traffic in Group X differs from railway traffic in any other group.

The increase in freight train mileage during the 10 years ending 1889 was 210.20 per cent, and the increase in passenger train mileage during the same period was 290.10 per cent. A comparison of these figures with the figures given above strengthens the opinion that there has been no very marked increase in the economy with which the business of transportation on the railways in Group X is carried on.

TABLE V—EARNINGS AND INCOME.—This table shows the earnings and income of operating railways, and classifies them as earnings from freight traffic, earnings from passenger traffic, and income from fixed investments and other sources. It also shows the per cent of operating expenses to earnings from operation.

The figures presented in Table V may be accepted as accurately representing the totals of earnings and income, since the mileage for which no data were returned is very small. In order, however, to bring this bulletin into harmony with the other bulletins in this series, the following summary is inserted, which shows the earnings from freight service, the earnings from passenger service, and gross earnings from operations assigned to a mileage basis:

EARNINGS FROM FREIGHT AND PASSENGER SERVICE ASSIGNED TO MILEAGE OF OPERATED LINE.

EARNINGS.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
From freight service per mile of line.....	\$1,022.48	\$1,342.57	\$1,162.60	\$6,449.48	\$2,998.76	\$2,947.59	\$3,090.31	\$3,313.52	\$3,893.04	\$3,516.96
From passenger service per mile of line.....	1,995.80	1,997.33	2,001.55	1,866.51	1,733.19	1,539.25	1,595.87	1,757.02	1,951.39	1,885.14
Gross earnings from operation per mile of line....	6,125.91	6,439.84	6,200.64	5,399.83	4,831.24	4,555.35	4,767.15	5,132.55	5,903.23	5,549.65

From the preceding summary it appears that the gross earnings per mile of line has decreased from \$6,125.91 in 1880 to \$5,540.65 in 1889. This decrease is in large measure due to the decrease in receipts from freight traffic. Thus, in 1880 the receipts from freight traffic were \$4,022.48 per mile of line and in 1889 they were \$3,516.96 per mile of line. The lowest point reached is observed to be in the year 1885, when the receipts from freight service fell to \$2,947.59 per mile of line.

RECEIPTS PER MILE FROM FREIGHT AND PASSENGERS.

YEARS.	Receipts per mile per ton moved.	Receipts per mile per passenger carried. (a)
	<i>Cents.</i>	<i>Cents.</i>
1880.....	3,162	2,968
1881.....	3,165	3,075
1882.....	2,570	2,929
1883.....	2,791	2,998
1884.....	2,595	2,920
1885.....	2,255	2,805
1886.....	1,705	2,353
1887.....	1,707	2,333
1888.....	1,868	2,376
1889.....	1,850	2,314

a Deduct 11 per cent from passenger earnings for mail and express.

TABLE VI—EXPENDITURES.—This table shows the total expenditures incurred by operating companies, and classifies the same as operating expenses, interest on funded debt, rentals, taxes, and dividends. It also gives a statement of the surpluses and deficits as reported by operating companies.

As in most of the other groups, it is observed that the increase in operating expenses is at a more rapid rate than the increase in gross earnings from operations, the increase in the former being 212.24 and in the latter 123.20 per cent. On the other hand, the increase in the interest on funded debt is at a less rapid rate than the increase in operating expenses. The increase in payments for taxes is quite marked, it being \$561,869.56 in 1880 and \$1,767,628.83 in 1889.

TABLE VII—OPERATING EXPENSES.—This table gives an analysis of operating expenses, classified so as to show expenses incurred in maintenance of way and structure, in maintenance of equipment, in conducting transportation, and in general expenses.

On the following page is given a consolidated income account, showing the increase and expenditures for the railways in Group X for the 10 years ending 1889. In no other manner is it possible to indicate the operations of railways so perfectly.

INCOME ACCOUNT OF RAILWAYS IN GROUP X COVERING THE OPERATIONS
FOR THE 10 YEARS ENDING 1889.

ITEMS.	Amount.	Total.	Per mile of line, reduced for comparison with annual earnings.
Gross earnings from operation -----	\$130,964,881.31		\$5,465.22
Less operating expenses -----	241,920,387.81		3,634.20
Income from operation -----		\$189,044,493.50	2,371.02
Income from other sources -----		29,599,353.18	371.24
Total income -----		218,643,846.68	2,742.26
Deductions from income :			
Interest on funded debt -----	102,254,281.94		1,282.49
Rentals -----	48,465,092.51		607.86
Taxes -----	11,979,898.44		150.25
Miscellaneous -----	33,388,222.78		418.76
Total deductions from income -----		196,087,495.67	2,459.36
Final net income -----		22,556,351.01	282.90
Dividends -----		32,247,378.18	404.45
Deficit from operations for the 10 years ending 1889.		9,691,027.17	121.55

The most interesting part of the above summary is the column which gives the average earnings per mile of line for the 10 years covered by the bulletin. It will be observed that payments as interest on funded debt are on an average equal to \$1,282.49 per mile of line, payments as rentals from operating roads to subsidiary roads \$607.86 per mile of line, and payments as dividends \$404.45 per mile of line. These three items make up the total of payments to proprietors of railway property, and show a total payment of \$2,294.80 per mile of line. This sum, capitalized at 5 per cent, shows the valuation of railway property in Group X to be \$45,896 per mile of line. The actual capitalization of these railways is \$103,291 per mile of line. When the amount of business transacted, the efficiency of equipment and employés, the rates charged for passenger and freight traffic, the capitalization of railway property, and the calculated value of railway property regarded as an investment are all taken into consideration the railways in Group X present to the legislature a very interesting problem of public policy.

In the summary below there are given various items of expenditure assigned to mile of line for each of the 10 years ending 1889.

EXPENDITURES ASSIGNED TO MILE OF OPERATED LINE.

ITEMS.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
Operating expenses -----	\$2,810.28	\$2,914.12	\$3,027.45	\$2,684.63	\$2,753.13	\$2,472.72	\$2,751.55	\$3,037.94	\$3,845.00	\$3,555.78
Interest -----	1,362.45	1,221.90	1,151.53	1,120.24	1,205.44	1,538.50	1,328.86	1,245.45	1,269.28	1,329.69
Rentals -----	811.01	769.76	741.65	623.13	587.36	523.42	468.65	650.37	598.55	527.52
Taxes -----	128.04	135.77	169.16	141.09	178.34	173.44	142.89	141.07	121.32	163.23
Dividends -----	1,028.25	1,241.85	962.74	873.97	484.23	213.40	174.64	28.39	26.06	71.11
Total expenditures, includ- ing miscellaneous.	6,518.57	7,065.60	6,793.28	5,994.55	5,797.34	5,499.97	5,067.42	5,277.80	6,069.17	5,919.26

The figures in this summary are presented without comment.

TABLE II.—EQUIPMENT AND STATIONS.

ANALYSIS OF EQUIPMENT AND STATIONS.	FOR 9 YEARS ENDING 1889.									
	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
LOCOMOTIVES	470	505	783	878	948	967	985	1,008	1,103	1,322
Freight	247	319	424	513	556	567	571	561	641	737
Passenger	197	243	309	317	337	341	352	381	434	472
Switching	26	33	50	55	55	59	62	66	88	113
Increase		125	188	95	70	13	18	23	155	159
Per cent of increase		25.60	31.00	12.13	7.97	2.00	1.86	23.34	15.38	13.67
Decrease										852
Per cent of decrease										181.28
CARS IN PASSENGER SERVICE	624	729	849	911	977	1,029	1,083	1,161	1,325	1,408
Ordinary	448	515	589	630	678	615	658	716	786	842
Sleeping	42	60	64	156	163	166	163	165	212	229
Parlor	4	4	4	4	4	4	4	3	5	5
Dining				3	3	4	4	5	5	5
Baggage	80	89	104	118	124	132	144	151	183	192
Postal	23	25	41	44	46	47	47	60	66	71
Express	27	36	47	56	50	64	73	61	68	73
Increase		105	120	62	66	52	54	78	164	83
Per cent of increase		16.83	16.46	7.30	7.24	5.32	5.25	7.20	14.13	6.26
Decrease										784
Per cent of decrease										125.64
CARS IN FREIGHT SERVICE	9,479	12,120	17,289	17,559	18,921	18,941	20,581	22,911	25,612	28,248
Box	4,244	5,419	8,611	8,232	8,965	8,889	10,395	11,469	12,468	14,766
Flat	4,500	6,762	7,287	7,668	7,656	7,336	7,331	7,332	8,349	8,675
Stock	87	180	269	269	364	443	489	489	591	638
Coal	81	121	428	693	1,159	1,453	1,491	2,420	2,564	3,038
Truck	76	117	154	76	86	92	87	117	88	88
Refrigerator				3	7	8	22	47	33	85
Other	431	621	540	598	654	729	766	614	880	638
Increase		2,911	5,109	270	1,362	1,640	1,640	2,330	2,761	2,635
Per cent of increase		27.86	42.66	1.56	7.76	0.11	8.66	11.32	11.79	16.29
Decrease										18,769
Per cent of decrease										198.91
CARS IN COMPANY'S SERVICE	164	226	363	310	299	306	321	429	498	559
Increase		65	71	7	7	7	15	39	78	61
Per cent of increase		39.63	32.31	2.31	2.34	2.34	4.60	39.84	18.57	12.25
Decrease										
Per cent of decrease										
CARS CONTRIBUTED TO EAST-FREIGHT SERVICE						192	191	165	191	188
Increase						192	2	1	4	3
Per cent of increase						192	1.04	0.52	2.05	1.57
Decrease										
Per cent of decrease										
STATIONS ON LINE	389	516	584	719	778	770	816	810	1,063	1,160
Increase		127	68	59	85	46	46	85	163	177
Per cent of increase		32.65	13.18	23.12	8.21	5.97	5.97	10.17	15.63	15.63
Decrease										
Per cent of decrease										

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF EQUIPMENT AND STATIONS WAS OBTAINABLE.

Mileage	21,50	49,99	66,99	62,50	100,33	147,60	154,39	178,11	357,99	392,38
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TABLE III.—EMPLOYÉS.

	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	FOR 9 YEARS ENDING 1889.
ANALYSIS OF EMPLOYÉS.											
Employés:											
Total	9,529	11,160	34,287	20,283	17,455	17,260	19,740	25,658	30,729	29,728	201,199
Increase		1,670	3,188	5,906			2,480	5,918	5,071		211,97
Per cent of increase		17.53	28.47	41.68			14.37	29.98	19.76		
Decrease					2,998	195				1,001	
Per cent of decrease					14.36	1.12				3.20	
MAINTENANCE OF WAY AND STRUCTURE:											
Total	3,511	4,098	5,331	7,593	6,978	6,361	7,378	9,812	11,453	11,195	7,684
Increase		587	1,253	2,232			2,394	1,949	1,695		3,438
Per cent of increase		16.72	30.09	41.87			12.81	36.79	16.72		218.86
Decrease					389	615				258	
Per cent of decrease					7.74	8.81				2.25	
MAINTENANCE OF EQUIPMENT:											
Total	1,691	1,977	2,522	3,841	3,181	3,625	3,978	5,027	6,722	5,139	3,438
Increase		286	645	1,319		444	353	1,049	1,695		293.90
Per cent of increase		16.91	27.57	62.30		13.96	9.74	26.37	33.72		
Decrease					690					1,387	
Per cent of decrease					17.18					23.55	
CONDUCTING TRANSPORTATION:											
Total	3,492	4,031	5,127	7,322	5,919	5,821	6,431	8,689	9,993	11,238	7,816
Increase		609	1,096	2,135			1,140	1,758	1,304		228.40
Per cent of increase		17.80	27.19	42.81			19.07	25.36	15.91		
Decrease					1,403	98				12,46	
Per cent of decrease					19.16	1.66					
GENERAL ADMINISTRATION:											
Total	905	1,093	1,407	1,657	1,377	1,451	1,653	2,130	2,561	2,156	1,251
Increase		188	314	250			202	477	431		138.23
Per cent of increase		20.77	28.73	17.77			13.92	28.86	20.23		
Decrease					290					405	
Per cent of decrease					16.30					15.81	

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF EMPLOYÉS WAS OBTAINABLE.

Mileage	984.03	1,653.39	2,304.19	1,741.03	1,470.03	1,549.99	1,627.61	558.59	674.71	470.18
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nets, the value of which was \$823,919; gill nets to the value of \$408,797; 176 seines, worth \$15,089, and other apparatus of capture amounting in value to \$97,252. The capital invested in shore property directly connected with the fisheries was \$804,814. These items give, as the total investment in fishing property, \$2,832,959. The quantity of fish taken was 117,085,568 pounds, the value of which at first hands was \$2,615,784.

From the subjoined table, showing the number of fishermen on each lake, it will be seen that there has been an increase of 2,403 persons, or 53.48 per cent, over 1880, this increase being shared by all the lakes except Ontario. Lake Erie has the largest number of persons employed and exhibits the greatest increase, although the percentage of increase, 59.31, is less than that of Lakes Superior and Huron and Saint Clair, which show 113.82 and 97.27 per cent increase, respectively. Lake Ontario, with the fewest number of persons, has undergone a decrease of 32.20 per cent, suggestive of the serious decline noticeable in other respects.

NUMBER OF FISHERMEN.

LAKES.	Census of 1880.	Census of 1890.	Increase in 1890.	Percentage of increase.
Total.....	4,493	6,896	2,403	53.48
Superior.....	369	789	420	113.82
Michigan.....	1,436	2,084	648	45.13
Huron and Saint Clair.....	732	1,444	712	97.27
Erie.....	1,369	2,181	812	59.31
Ontario.....	587	398	a189	a32.20

a Decrease.

The returns as condensed in the following comparative table indicate a large increase in 1889 over 1880 in the amount of capital devoted to the fisheries. More than half the total investment of \$2,832,959 is to be credited to Lake Erie, which advances from second position, held in 1880, and now takes first rank in this respect, the increase being greater than in any other lake, amounting to 187.66 per cent. Lake Michigan, which stood first in 1880, has dropped to second place, and shows a smaller increase than any other lake, viz, 30.01 per cent. Lakes Huron and Saint Clair have undergone an advance of 160.64 per cent, and are closely followed by Lake Superior, with an increase of 159.06 per cent. Lake Ontario, as in almost every other respect, has declined in the amount of investment and exhibits a loss of 11.72 per cent. The aggregate net increase has been \$1,486,984, or 110.48 per cent.

TOTAL CAPITAL INVESTED.

LAKES.	Census of 1880.	Census of 1890.	Increase in 1890.	Percentage of increase.
Total.....	\$1,345,975	\$2,832,959	\$1,486,984	110.48
Superior.....	81,380	210,825	129,445	159.06
Michigan.....	551,135	716,549	165,414	30.01
Huron and Saint Clair.....	144,310	376,136	231,826	160.64
Erie.....	515,100	1,481,733	966,633	187.66
Ontario.....	54,050	47,716	a6,334	a11.72

a Decrease.

The pound net, with its modification, the trap net, is the most productive form of apparatus employed in the fisheries of the Great Lakes, and it may be said to be the characteristic means of capture. The comparative table shows that in Lake Ontario the percentage of increase is greater than in any other lake, being 405.88 per cent. Lake Superior comes next, with an increase of 388.37 per cent, while Lakes Huron and Saint Clair, Erie, and Michigan follow in the order named, with increases of 299.47, 142.48, and 79.83 per cent, respectively.

TABLE V.—EARNINGS AND INCOME.

	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	FOR 9 YEARS ENDING 1889.
ANALYSIS OF EARNINGS AND INCOME.											
EARNINGS FROM FREIGHT SERVICE:											
Total.....	\$17,651,030.35	\$22,434,286.46	\$25,939,566.68	\$25,911,974.93	\$24,556,638.50	\$28,415,016.37	\$27,481,644.81	\$31,945,079.50	\$39,002,602.21	\$38,085,316.07	\$29,433,685.72
Increase.....		4,782,656.11	3,505,280.22	27,591.75	1,355,336.43	868,376.87	2,069,625.44	4,460,428.09	7,057,622.71	20,414,247.87	11,096,165.10
Per cent of increase.....		27.09	15.62	0.11	5.23	3.49	8.14	16.23	22.60	53.35	37.35
Decrease.....											
Per cent of decrease.....											
EARNINGS FROM PASSENGER SERVICE:											
Total.....	8,758,082.77	10,318,478.73	12,655,259.76	14,020,959.47	14,193,909.11	13,271,870.88	14,193,909.11	16,737,023.51	20,145,628.99	20,414,247.87	11,096,165.10
Increase.....		1,560,395.96	2,336,781.03	1,365,762.71	172,660.19	321,468.23	321,468.23	2,533,624.40	3,418,665.48	298,618.88	1,096,165.10
Per cent of increase.....		17.82	22.65	10.79	1.23	0.39	0.39	17.85	20.44	1.33	9.85
Decrease.....											
Per cent of decrease.....											
GROSS EARNINGS FROM OPERATION:											
Total.....	26,882,012.74	33,209,043.96	39,204,940.28	40,562,746.73	39,562,765.23	39,277,616.52	42,398,037.60	49,482,079.37	60,825,744.20	59,909,894.68	33,117,881.94
Increase.....		6,387,031.22	5,935,896.32	1,367,806.45	3.46	3,120,421.08	7,084,041.77	7,084,041.77	10,843,664.83	10,843,664.83	123,290
Per cent of increase.....		23.76	17.84	3.46	0.01	7.94	16.71	16.71	21.91	21.91	0.37
Decrease.....											
Per cent of decrease.....											
INCOME FROM ALL OTHER SOURCES:											
Total.....	3,101,474.97	3,744,053.08	3,669,029.91	3,602,267.27	4,584,241.47	5,652,568.03	1,403,480.74	1,137,558.25	1,262,354.19	1,442,225.27	1,459,149.70
Increase.....		642,578.11	5,855,896.32	1,367,806.45	981,574.20	1,088,326.56	3,120,421.08	7,084,041.77	134,795.94	179,971.08	1,459,149.70
Per cent of increase.....		20.72	17.84	3.46	27.26	23.39	7.94	16.71	10.57	14.26	101.35
Decrease.....											
Per cent of decrease.....											
TOTAL EARNINGS AND INCOME:											
Total.....	29,983,487.71	37,013,097.04	42,873,970.19	44,165,014.00	44,147,006.70	44,930,184.55	43,801,518.34	50,619,637.62	61,588,098.39	61,442,219.95	31,458,732.24
Increase.....		7,029,609.33	6,860,873.15	1,291,043.81	18,007.30	783,177.85	6,818,119.28	6,818,119.28	10,968,460.77	10,968,460.77	104.92
Per cent of increase.....		23.44	15.83	3.01	0.04	1.77	15.57	15.57	21.67	21.67	0.33
Decrease.....											
Per cent of decrease.....											
PER CENT OF OPERATING EXPENSES TO EARNINGS:											
Per cent.....	45.88	46.25	48.82	49.72	56.99	54.28	57.72	59.19	64.89	64.18	18.30
Increase.....			3.57	0.90	7.27		3.44	1.47	5.61	0.02	
Decrease.....											

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF EARNINGS WAS OBTAINABLE.

Mileage.....	75.49	78.49	85.80	152.39	180.00	197.33	189.00	390.00	335.38
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TABLE VI.—LAFAYETTE COUNTY.

ANALYSIS OF EXPENDITURES.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	FOR 9 YEARS ENDING 1889.
OPERATING EXPENSES:											
Total	\$12,332,182.10	\$15,064,597.24	\$19,141,731.81	\$20,100,575.76	\$22,545,177.11	\$21,230,557.26	\$24,471,731.04	\$29,288,229.64	\$33,063,814.07	\$38,565,694.58	\$26,173,567.48
Increase		2,722,365.24	4,087,034.41	1,024,843.25	2,378,611.25	1,224,519.73	3,131,163.68	4,816,596.89	3,803,579.45	588,115.49	212.24
Per cent of increase		22.08	21.15	5.25	11.79	5.45	14.78	19.65	11.45	1.50	
Decrease											
Per cent of decrease											
INTEREST ON FUNDED DEBT:											
Total	5,978,769.04	6,312,510.70	7,290,891.24	8,415,117.89	9,871,214.70	13,295,459.77	11,515,615.16	12,067,140.40	12,965,362.64	14,369,249.40	8,420,480.36
Increase		333,741.65	968,290.54	1,194,316.65	1,456,196.81	3,391,145.07	1,888,525.24	188,525.24	895,162.24	1,483,945.76	140.84
Per cent of increase		5.58	15.34	15.58	17.20	34.38	1.60	1.60	7.48	11.38	
Decrease											
Per cent of decrease											
RENTALS:											
Total	3,538,913.24	3,976,881.94	4,689,294.85	4,680,838.09	4,869,819.13	4,513,123.80	4,108,044.41	6,279,055.09	6,055,748.09	5,712,553.27	2,153,640.03
Increase		417,968.70	712,582.91	123,961.04	123,961.04	296,695.33	245,079.29	2,102,941.28	184,237.60	373,104.82	60.51
Per cent of increase		11.74	17.92	2.65	2.76	6.17	5.93	33.25	3.04	6.13	
Decrease											
Per cent of decrease											
TAXES:											
Total	561,869.56	701,384.84	1,069,574.60	1,050,189.99	1,460,445.26	1,495,488.64	1,270,797.18	1,260,042.29	1,223,486.25	1,707,628.83	1,205,739.27
Increase		139,515.28	308,179.76	407,253.27	407,253.27	35,043.38	7.02	89,246.11	594,142.58	594,142.58	214.60
Per cent of increase		24.83	52.49	37.88	37.88	2.40	0.55	7.02	48.56	43.30	
Decrease											
Per cent of decrease											
DIVIDENDS:											
Total	4,512,285.18	6,415,746.00	6,087,142.00	6,565,110.00	3,963,245.00	1,840,000.00	1,553,250.00	273,750.00	265,000.00	770,000.00	3,742,235.18
Increase		1,903,460.82		477,968.00						505,000.00	82.94
Per cent of increase		42.18		7.85						190.57	
Decrease											
Per cent of decrease											
TOTAL EXPENDITURES, INCLUDING MISCELLANEOUS:											
Total	23,005,111.42	26,501,800.20	42,952,065.46	45,030,238.84	47,474,092.40	47,422,418.17	45,335,416.21	50,882,339.49	61,851,965.20	64,099,884.13	35,494,772.70
Increase		7,596,688.87	6,450,205.19	2,078,222.35	2,443,893.56	2,125,245.00	286,750.00	5,540,223.28	11,069,625.71	2,147,918.93	124.09
Per cent of increase		27.61	17.67	4.84	5.43	53.60	0.63	12.24	21.76	3.47	
Decrease											
Per cent of decrease											
Surplus	1,378,376.28	511,296.74	78,095.30	865,214.84	3,327,085.70	2,492,233.62	1,533,897.87	262,701.87	363,896.81	2,657,664.18	9,691,027.17
Deficit											
Mileage		75.49	78.49	85.80	152.53	180.00	197.33	189.00	330.60	335.38	

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF EXPENDITURES WAS OBTAINABLE.

TABLE VII.—OPERATING EXPENSES.

	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	FOR 9 YEARS ENDING 1889.
ANALYSIS OF OPERATING EXPENSES.											
MAINTENANCE OF WAY AND STRUCTURE:											
Total	\$3,346,762.79	\$4,056,948.54	\$4,950,042.07	\$5,157,144.93	\$5,058,484.83	\$4,508,422.63	\$5,291,047.12	\$6,451,430.80	\$9,702,691.53	\$8,891,611.30	\$8,584,848.51
Increase		730,185.75	892,043.53	198,102.86	601,339.99	3.39	692,634.49	1,100,383.68	3,251,560.73		
Per cent of increase		21.52	21.94	3.99	9.72		15.06	21.93	50.40		
Decrease											
Per cent of decrease											
Total						1,030,062.20				171,380.23	
Per cent of increase						18.73				7.95	
MAINTENANCE OF EQUIPMENT:											
Total	1,539,896.19	1,820,045.91	2,845,321.40	2,533,061.35	3,109,661.89	3,215,367.12	3,632,513.38	4,057,359.28	5,487,543.26	5,502,169.70	3,962,363.51
Increase		280,149.72	1,025,276.49	636,600.64	636,600.64	45,705.23	417,146.26	424,836.90	1,430,192.98	14,656.44	
Per cent of increase		18.19	36.32	3.99	25.13	1.44	12.97	11.70	35.25	0.27	
Decrease											
Per cent of decrease											
Total				312,260.05							
Per cent of increase				10.37							
CONDUCTING TRANSPORTATION:											
Total	6,445,923.63	8,135,642.09	9,900,739.42	10,971,920.50	11,892,650.24	11,555,610.86	12,962,170.15	16,249,539.17	21,011,830.35	20,694,196.22	14,248,272.59
Increase		1,689,718.46	1,860,957.33	975,121.08	920,639.74	8.39	1,436,568.29	3,257,721.02	4,761,638.18	29,309.30	221.04
Per cent of increase		26.22	22.87	9.75	8.39		12.43	20.07	29.30	0.14	
Decrease											
Per cent of decrease											
Total						336,939.38				317,634.13	
Per cent of increase						2.83				1.51	
GENERAL EXPENSES:											
Total	999,509.46	1,031,860.80	1,340,568.92	1,504,448.98	1,824,480.15	1,951,156.75	2,555,960.39	2,520,558.39	2,891,444.93	3,377,687.36	26,173,562.48
Increase		32,251.31	308,708.12	163,890.06	320,031.17	125,076.00	604,833.64	3,257,721.02	361,886.54	486,242.43	
Per cent of increase		3.23	29.92	12.22	21.27	6.94	31.00	14.31	16.82	16.82	
Decrease											
Per cent of decrease											
Total								20,432.00			
Per cent of increase								1.03			
TOTAL OPERATING EXPENSES:											
Total	12,332,192.10	15,054,697.34	19,143,731.81	20,166,575.76	22,545,177.11	21,320,557.36	24,471,721.04	29,288,230.64	39,093,810.07	38,505,694.58	26,173,562.48
Increase		2,722,505.24	4,087,034.17	1,024,843.95	2,378,601.35	2,320,557.36	3,151,163.68	4,816,509.60	9,865,579.43	9,865,579.43	
Per cent of increase		22.08	27.15	6.35	11.79	11.79	14.78	19.68	33.48	33.48	
Decrease											
Per cent of decrease											
Total											
Per cent of increase											
Total											
Per cent of increase											

MILEAGE OF OPERATED LINE FOR WHICH NO REPORT OF OPERATING EXPENSES WAS OBTAINABLE.

Mileage	75.49	78.49	85.80	152.33	180.00	107.33	189.00	330.60	335.38
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CENSUS BULLETIN.

No. 173.

WASHINGTON, D. C.

March 18, 1892.

FISHERIES OF THE GREAT LAKES.

DEPARTMENT OF THE INTERIOR,
CENSUS OFFICE,
WASHINGTON, D. C., February 24, 1892.

The statistics presented herewith show in detail, by lakes, the extent of the commercial fisheries of the so-called Great Lakes as they existed in 1889. The returns represent over 3,500 miles of shore line canvassed by the agents of the office, and in many features, especially the items of wages, profits, expense, etc., are entirely novel. The bulletin has been prepared by Mr. CHARLES F. PIDGIN and Mr. BERT FESLER, special agents of the Census Office, with the valuable assistance of Dr. HUGH M. SMITH, of the United States Fish Commission, who was the compiler of the "Review of the Fisheries of the Great Lakes", issued by that department.

The fisheries of the Great Lakes are the most extensive lake fisheries in the world. Their great economic importance to the states adjacent to the lakes and as a source of national wealth can be readily understood and appreciated by referring to the accompanying tabular statements, in which are shown the large number of persons engaged, the great amount of capital invested, and the enormous quantity and value of the products taken.

There has sprung up an extensive branch of trade entirely dependent on the fisheries and yet sufficiently distinct to constitute a well-defined occupation. This is the business of buying, freezing, smoking, and otherwise curing and preparing fish and fishery products. For this purpose swiftly moving steamers and expensive storehouses and refrigerators are required, the former to collect the fish and the latter to retain them.

Nor does the importance of the fisheries stop with the mere capture and handling of the fish. Other industries of great extent are more or less related to or entirely dependent on the prosecution and perpetuation of these fisheries, among which may be mentioned salt mining, ice harvesting, barrel and box making, boat and vessel building, net and twine manufacture, etc.

There should also be borne in mind the large and rapidly increasing population which is dependent on the successful operation of the fisheries for a no inconspicuous part of its food supply, the vast area of country over which the products are distributed, and the great amount of railroad and steamboat traffic that is occasioned by this distribution.

Mention should here be made of the wonderful productiveness of the waters of the Great Lakes so far as the yield of fish is concerned. A careful estimate, based on the known production in 1880, 1885, and 1889, shows that in the decade terminating with the census of 1890 over 1,000,000,000 pounds of food fish were taken, which yielded the fishermen over \$25,000,000.

As will appear from the subsequent tables, 6,896 persons were engaged in 1889 in the capture of fish on the Great Lakes. These employed 107 steamers, valued at \$357,650, and 3,876 other vessels and boats, worth \$325,438. The apparatus used consisted of 3,831 pound nets and trap

nets, the value of which was \$823,919; gill nets to the value of \$408,797; 176 seines, worth \$15,089, and other apparatus of capture amounting in value to \$97,252. The capital invested in shore property directly connected with the fisheries was \$804,814. These items give, as the total investment in fishing property, \$2,832,959. The quantity of fish taken was 117,085,568 pounds, the value of which at first hands was \$2,615,784.

From the subjoined table, showing the number of fishermen on each lake, it will be seen that there has been an increase of 2,403 persons, or 53.48 per cent, over 1880, this increase being shared by all the lakes except Ontario. Lake Erie has the largest number of persons employed and exhibits the greatest increase, although the percentage of increase, 59.31, is less than that of Lakes Superior and Huron and Saint Clair, which show 113.82 and 97.27 per cent increase, respectively. Lake Ontario, with the fewest number of persons, has undergone a decrease of 32.20 per cent, suggestive of the serious decline noticeable in other respects.

NUMBER OF FISHERMEN.

LAKES.	Census of 1880.	Census of 1890.	Increase in 1890.	Percentage of increase.
Total.....	4,493	6,896	2,403	53.48
Superior.....	369	789	420	113.82
Michigan.....	1,436	2,084	648	45.13
Huron and Saint Clair.....	732	1,444	712	97.27
Erie.....	1,369	2,181	812	59.31
Ontario.....	587	398	a189	a32.20

a Decrease.

The returns as condensed in the following comparative table indicate a large increase in 1889 over 1880 in the amount of capital devoted to the fisheries. More than half the total investment of \$2,832,959 is to be credited to Lake Erie, which advances from second position, held in 1880, and now takes first rank in this respect, the increase being greater than in any other lake, amounting to 187.66 per cent. Lake Michigan, which stood first in 1880, has dropped to second place, and shows a smaller increase than any other lake, viz, 30.01 per cent. Lakes Huron and Saint Clair have undergone an advance of 160.64 per cent, and are closely followed by Lake Superior, with an increase of 159.06 per cent. Lake Ontario, as in almost every other respect, has declined in the amount of investment and exhibits a loss of 11.72 per cent. The aggregate net increase has been \$1,486,984, or 110.48 per cent.

TOTAL CAPITAL INVESTED.

LAKES.	Census of 1880.	Census of 1890.	Increase in 1890.	Percentage of increase.
Total.....	\$1,345,975	\$2,832,959	\$1,486,984	110.48
Superior.....	81,380	210,825	129,445	159.06
Michigan.....	551,135	716,549	165,414	30.01
Huron and Saint Clair.....	144,310	376,136	231,826	160.64
Erie.....	515,100	1,481,733	966,633	187.66
Ontario.....	54,050	47,716	a6,334	a11.72

a Decrease.

The pound net, with its modification, the trap net, is the most productive form of apparatus employed in the fisheries of the Great Lakes, and it may be said to be the characteristic means of capture. The comparative table shows that in Lake Ontario the percentage of increase is greater than in any other lake, being 405.88 per cent. Lake Superior comes next, with an increase of 388.37 per cent, while Lakes Huron and Saint Clair, Erie, and Michigan follow in the order named, with increases of 299.47, 142.48, and 79.83 per cent, respectively.

In the following table is shown, by lakes, the value of the fish marketed in 1880 and 1889, with a statement of the increase or decrease in the latter year and the increase or decrease per cent:

VALUE OF FISH.

LAKES.	Census of 1880.	Census of 1890.	Increase in 1890.	Percentage of increase.
Total -----	\$1, 652, 900	\$2, 615, 781	\$962, 881	58.25
Superior -----	118, 370	280, 807	162, 437	137.23
Michigan -----	668, 400	788, 536	120, 136	17.97
Huron and Saint Clair -----	231, 550	427, 252	195, 702	84.52
Erie -----	474, 880	1, 033, 758	558, 878	117.69
Ontario -----	159, 700	85, 431	a74, 269	a46.51

a Decrease.

The quantity of fish taken, as shown in the annexed table, naturally bears a close relation to the value of the catch, to which reference has already been made. An increase in the output since 1880 is to be observed in all the lakes except one, and has aggregated 48,343,568 pounds, or 70.33 per cent. Lake Erie is to be credited with 63,563,332 pounds, or considerably more than the catch of all the other lakes combined. The increase over 1880, 34,476,032 pounds, or 118.53 per cent, is actually and relatively greater than in any other member of the series. This lake now leads Michigan, which ranks second, by 37,556,388 pounds, while in 1880 the difference was only 5,945,425 pounds. Lake Michigan, with its output of 26,006,944 pounds, has advanced only 2,865,069 pounds, or 12.38 per cent, the increase being less than in any other lake, although this lake still maintains the relative rank which it held in 1880. The largest relative increase is in Lake Superior, and amounts to 106.57 per cent. Lakes Huron and Saint Clair also show a substantial gain, viz, 87.05 per cent. Lake Ontario, which has previously been surpassed by the other lakes in the quantity of fish taken, has not benefited its relative standing in the past decade, but, on the contrary, shows a decrease of 948,054 pounds, or 26.05 per cent.

TOTAL NUMBER OF POUNDS OF FISH TAKEN.

LAKES.	Census of 1880.	Census of 1890.	Increase in 1890.	Percentage of increase.
Total -----	68, 742, 000	117, 085, 568	48, 343, 568	70.31
Superior -----	3, 816, 625	7, 883, 949	4, 067, 324	106.57
Michigan -----	23, 141, 875	26, 006, 944	2, 865, 069	12.38
Huron and Saint Clair -----	9, 056, 200	16, 939, 397	7, 883, 197	87.05
Erie -----	29, 087, 300	63, 563, 332	34, 476, 032	118.53
Ontario -----	3, 640, 000	2, 691, 946	a948, 054	a26.05

a Decrease.

Herring, trout, whitefish, and sturgeon constitute more than two-thirds of the total catch of fish in the lakes, and may therefore be appropriately selected as the objects of brief comment with special reference to past and present abundance. A condensed comparative table is presented for each species, showing by lakes the yield according to the Tenth and Eleventh Censuses and the increase or decrease in 1889, with the percentage of gain or loss.

Lake herrings, which are really a species of whitefish and quite distinct from the herrings which occur on the coast, are the most abundant and valuable food fish occurring in the Great Lakes. The catch in 1889 reached 53,660,921 pounds, valued at \$717,061, an increase of 37,693,404 pounds, or 236.06 per cent, over 1880. More than three-fifths of the entire yield was taken in Lake Erie, in which the increase during the decade was 25,426,450 pounds, or 215.95 per cent. Lake Michigan follows Lake Erie in the amount of the catch, producing 9,568,587 pounds, an increase of 6,518,187 pounds, or 213.68 per cent. Lakes Huron and Saint Clair show a remarkable advance, the increase being 836.53 per cent, although the actual catch was less than half of that

of Lake Michigan. The herring is the only important species in Lake Ontario the output of which shows an advance over 1880, when 611,217 pounds were taken, while in 1889 there was a gain of 1,238,923 pounds, or 202.70 per cent. Smaller quantities of herring are taken in Lake Superior than in any other member of the chain, while the percentage of increase, 1,023.89 per cent, is greater than elsewhere. Only 34,000 pounds were reported for the lake in 1880; in 1889 382,123 pounds were taken.

The lake trout, which is one of the most important and highly esteemed fishes of the Great Lakes, will be seen, on consulting the following comparative table, to have increased 4,397,031 pounds, or 64.62 per cent, since 1880. It is most abundant in Lake Michigan, where nearly one-half the entire catch of 11,201,631 pounds was obtained, and where the increase since 1880 has been 2,920,908 pounds, or 109.83 per cent. Lake Superior ranks next to Lake Michigan in the abundance of trout in its waters, and also exhibits a substantial increase, amounting to 1,901,974 pounds, or 120.85 per cent. Passing to Lakes Huron and Saint Clair, it is found that the yield of this species is large, but the increase of 96,846 pounds is only 4.65 per cent more than in 1880. Trout are not plentiful in either Lake Erie or Lake Ontario. The former shows an increase of 40,503 pounds, or 154.59 per cent, but the latter exhibits a most remarkable decrease, amounting to 563,200 pounds, or 98.86 per cent, the yield in 1889 being only 6,500 pounds, against 569,700 pounds in 1880.

The whitefish is perhaps the most popular species occurring in the Great Lakes, and, next to herring, is the most abundant and profitable. The returns show an aggregate yield in 1889 of 15,326,488 pounds, a decrease of 6,137,412 pounds, or 28.59 per cent, as compared with 1880. This decrease is noticeable in all the lakes but Superior, where there has been a substantial gain, amounting to 1,641,558 pounds, or 72.73 per cent. The most pronounced decrease has been in Lake Ontario, where the decline in the catch of whitefish has kept pace with that of other species. The yield of 1,064,000 pounds in 1880 dwindled to only 23,383 pounds in 1889, the decrease being 97.80 per cent. The least decrease is exhibited by Lake Erie, where the catch in 1880 is almost duplicated in 1889, the decrease being only 10,028 pounds, or 0.30 per cent. The most serious decline is noticeable in Lake Michigan, in which considerably more than half the yield in 1880 was obtained, and where the loss in 1889, 6,506,429 pounds, was greater than the output in the same year, and amounted to 54.08 per cent.

The sturgeon is the largest fish found in the Great Lakes, and with the increasing demand for it as food and the ease with which it is captured a decrease in its abundance from year to year is to be anticipated. The output in 1880 was 7,557,383 pounds, of which more than half was credited to Lake Michigan. In 1889 the catch was only 2,798,725 pounds, a decrease of 4,758,658 pounds, or 62.97 per cent. The only lake exhibiting an increase is Lake Superior, in which the demand was so light that no sturgeon were put on the market in 1880; 84,469 pounds were secured in 1889. The diminished output in Lake Michigan is the most interesting point connected with the sturgeon fishery. The decrease of 3,227,247 pounds, or 84.05 per cent, has advanced Lake Erie from the second rank, which it held in 1880, to the first position in 1889, and the catch of sturgeon in this lake is now more than double that in Lake Michigan. Lakes Huron and Saint Clair, which in 1880 ranked third as regards output of sturgeon, have advanced to second place, and now lead Lake Michigan by 44,016 pounds.

NUMBER OF POUNDS OF FISH TAKEN.

HERRING.

LAKES.	Census of 1880.	Census of 1890.	Increase in 1890.	Percentage of increase.
Total.....	15,007,617	53,060,921	37,693,404	236.06
Superior.....	34,000	382,123	348,123	1,023.89
Michigan.....	3,050,400	9,568,587	6,518,187	213.68
Huron and Saint Clair.....	497,500	4,060,221	4,161,721	836.53
Erie.....	11,774,400	37,200,850	25,426,450	215.95
Ontario.....	611,217	1,850,140	1,238,923	202.70

NUMBER OF POUNDS OF FISH TAKEN—CONTINUED.

LAKE TROUT.

LAKES.	Census of 1880.	Census of 1890.	Increase in 1890.	Percentage of increase.
Total.....	6,804,600	11,201,631	4,397,031	64.62
Superior.....	1,464,750	3,366,724	1,901,974	129.85
Michigan.....	2,659,450	5,580,358	2,920,908	109.83
Huron and Saint Clair.....	2,084,500	2,181,346	96,846	4.65
Erie.....	26,200	66,703	40,503	154.59
Ontario.....	569,700	6,500	a563,200	a98.86

WHITEFISH.

Total.....	21,463,900	15,326,488	a6,137,412	a28.59
Superior.....	2,257,000	3,898,558	1,641,558	72.73
Michigan.....	12,030,400	5,523,971	a6,506,429	a54.08
Huron and Saint Clair.....	2,778,700	2,556,804	a221,896	a7.99
Erie.....	3,333,800	3,323,772	a10,028	a0.30
Ontario.....	1,064,000	23,383	a1,040,617	a97.80

STURGEON.

Total.....	7,557,383	2,798,725	a4,758,658	a62.97
Superior.....		84,469	84,469	
Michigan.....	3,839,600	612,353	a3,227,247	a84.05
Huron and Saint Clair.....	1,202,500	656,869	a546,131	a45.42
Erie.....	1,970,000	1,244,607	a725,393	a36.82
Ontario.....	545,283	290,927	a344,356	a63.15

a Decrease.

The condensed aggregate statistics of the lake fisheries are shown in the following table, the figures for 1880 and 1890 being exhibited side by side for purposes of comparison:

CONDENSED STATISTICS OF THE GREAT LAKE FISHERIES FOR THE CENSUSES OF 1880 AND 1890.

CLASSIFICATION.	1880.		1890.	
	Number.	Value.	Number.	Value.
Fishermen.....	4,493		6,896	
Vessels and boats.....	1,929	\$285,500	3,983	\$683,088
Apparatus.....		747,300		1,345,057
Shore property.....		313,175		804,814
Total investment.....		1,345,975		2,832,959
Pounds of fish taken.....	68,742,000	1,652,900	117,085,568	2,615,784

Robert P. Forlin

Superintendent of Census.

FISHERIES OF THE GREAT LAKES.

BY CHARLES F. PIDGIN AND BERT FESLER.

I.—GENERAL REMARKS.

The statistics of the fisheries given herein relate to the year 1889. In all cases where the information related to operations extending over the entire year, and also as regards values or other information having a fixed date, that year ended with December 31, 1889.

The plan of the schedule used was comprehensive, covering the names of vessels, with full particulars as to their rig, net tonnage, the year in which built, home port, the original cost and present value of vessel, and the number of months employed in fishing, with an explanation of the nature of the employment of the vessel during the balance of the year when not engaged in fishing.

The amount of capital invested was collected in such a way as to show the respective amounts invested in land, buildings, wharves, vessels, apparatus, etc. The amount of cash and credit capital, including borrowed money needed and used in the industry, was secured, but has not been included in the tables, and has been omitted also from the 1880 figures in the comparative tables.

The number of the different kinds of apparatus used in the capture of fish and in lifting them from the water was obtained, together with the value of each specified kind.

In obtaining statistics of fish products particular efforts were made to secure the classification in detail of the different kinds of fish taken, the statistics covering the quantity and value of each kind.

The other statistics called for related to the number of persons employed, the place of birth of fishermen and shore help, the average monthly earnings, the cost of outfit and expense, the methods of food-fish preparation, and a statement of the principal markets for fish and fish products.

It is gratifying to state that the work was well done by the field agents of the Census Office, and the coast line of the lakes was fully examined. All fishing stations, whether located in or near the larger cities and towns or in the smallest villages, were visited by the Census Office agents. These agents, in rowboats, exposed to the inclemencies of the weather, examined those sections of the coast located between the settlements with a view to find the individual fishermen and obtain the desired statistics. A similar work was done by the agents of the United States Fish Commission in the year 1885, and the very comprehensive report issued by that department, entitled "Review of the Fisheries of the Great Lakes in 1885", furnished a most valuable basis of comparison between the returns made by the field agents of the Census Office and those made by the Fish Commission. A mass of unpublished statistical data in the possession of the Fish Commission has been placed at the disposal of this office by Hon. Marshall McDonald, Commissioner of Fish and Fisheries, and the best service of both departments has been freely used to contribute to the completeness and accuracy of this bulletin. The statistics for the fisheries of the Great Lakes for the year 1879, prepared under the direction of Mr. G. Brown Goode, special agent in charge of the fishery division of the Tenth Census, supply statistics for that year which hereinafter are brought into comparison with the statistics for 1889. In the present bulletin the form of presentation of the fisheries of the Great Lakes is by lakes, with due specification of states and the counties in each state. In the volume on the fisheries of this census similar results for the states, with due specification of lakes and counties bordering upon the specified lakes, will be given.

Before presenting the various tables for the lakes in geographical order some explanation in regard to the nature of the returns becomes necessary. It was discovered by correspondence that

fishermen did not make full reports to the field agents of the respective quantities of frozen fish and fish packed in ice, and consequently some estimates, based upon correspondence, have been inserted in the tables relating to food-fish preparation.

Owing to the fact that the expense of barrels, boxes, kegs, salt, and ice is borne sometimes by the dealers and in some cases divided between the fishermen and dealers, the entire expense in comparatively few cases falling entirely upon the fishermen, the amounts returned for these items have been omitted from the table.

The tables under each lake relating to expenses include cost of provisions and repairs, amounts paid for interest, taxes, and insurance, and for towage, cartage, etc. The expense is mainly for items that are consumed during the fishing season, and is necessarily incurred each year. These items of expense are published in a separate table, because they can not properly be considered an investment, and are not included in any other table.

From the notes made by the field agents of the Census Office the following points of information of general application are compiled: from 1880 to 1889 the best fishing year was 1885. The decrease of fish in certain fisheries is due largely to sawdust from sawmills, which covers up the spawning and feeding grounds and injures the fish by getting into their gills. The legislation requiring sawmills to burn their sawdust and waste lumber has never been generally enforced. That it was needful legislation is shown by the fact that in some cases where the law was carried into effect the fisheries immediately improved. The use of nets with an undersized mesh and overfishing are mentioned by some as the reason for the decline in the number of fish. The artificial propagation of whitefish is generally commended, and in counties where the fishing has not been improved by it the failure is attributed to a lack of care in planting the fry. A large quantity of fish is caught in Canadian waters and sold in the United States. On the part sold fresh there is no duty; of the balance, about one-half pays lawful duty, while the remainder in various ways escapes paying it.

There has been but little change in the kind of apparatus used since 1880. The leaders of pound nets have been lengthened, and in many places the nets have been placed end to end, so as to extend many miles into the lake. In some counties there has been a decrease in the number of pound nets, with very nearly a corresponding increase in the number of gill nets. In some counties fyke-net fishing has been done away with entirely. Steamers have to a certain extent replaced sailboats in the gill-net fishery.

Many laws have been passed by the various states regulating the size of meshes in nets and prohibiting the fishing of certain kinds of nets in specified localities, but it is undoubtedly needless to remark that these laws have not always been fully enforced, and that there is not a general compliance with these ordinances on the part of the fishermen, except on Lake Ontario, where the rigid enforcement of prohibitory and restrictive measures has reduced commercial fishing to a minimum.

The following explanations of the methods of preparing the tables for the fisheries of the Great Lakes will be found of value: The various tables relate only to the capital, boats and apparatus, persons employed, etc., engaged in lifting fish from the water. No shore help is included except such as is necessary to carry on the business of the fishermen. Factory hands and persons engaged in the wholesale fish trade or employed in preparing fish at second hand have not been included in the presentation. The method of presentation is to show the states in alphabetical order under each lake and the counties in alphabetical order under each state. The designation of species in the products table is made to include the different kinds of fish which are generally sold in the markets under those names. When local names are reported from particular localities, they have been classified under the name which is in most general use, taking the lakes all together, and if any name which is well known as a designation of some important food fish in a particular locality does not appear in the table, it is because it has been combined with that name which is in most general use the lakes over. The terms whitefish, trout, and sturgeon cover whitefish, trout, and sturgeon only. Under bass are included black bass, gray bass, Oswego bass, rock bass, sun and rock bass, silver bass, white bass, and yellow bass. Catfish includes bullheads. Under herring are included the minor varieties of whitefish which are recognized under numerous vernacular names by fishermen in the different lakes, among which

may be mentioned blackfin, bloater, bluefin, bluefish, chub, cisco, greenback, ki-yi or ki-eye, lake herring, long jaw, long-jawed whitefish, long-necked whitefish, menominee, menominee whitefish, and pilot fish. Perch includes yellow perch. Pike and pickerel include blue pike, dory, grass pike, gray pike, muskellunge, hard pickerel, sand pike, sauger, shovel-nosed pike, snake, wall-eyed pike, yellow pickerel, and yellow pike. Suckers include bay fish, buffalo fish, and mullet. Under "other species" are included burbot, carp, eel, losh (dogfish, eelpout, lawyer), minnows, mixed fish, pan fish, roach, sheepshead, sunfish, and other minor varieties.

In classifying fishermen the aim has been to distinguish between those who received profits from fishing, who may be termed employers, and those who depend entirely upon wages. The employers include not only those who have capital invested in the industry, but also those who take a "lay" in lieu of wages, and who should therefore be included with the employers rather than with the fishermen and shore help, who are paid wages. It will be seen that the employers are those whose earnings or profits depend upon the catch, whether they had capital invested or not. The fishermen's wages were not dependent in any way upon the value of the catch. It was found impossible, except at a large expense of time and labor, to ascertain the number of fishermen between 18 and 45 years of age. The object of the inquiry was to arrive at the number of persons who might be available for service in the navy, and with comparatively few exceptions the total number of fishermen reported may be considered as available for such service.

Many of the fishermen engaged in fishing upon the Great Lakes are not obliged to find a market for their catch, but deliver it to dealers, who employ steamers to pass from point to point and collect the catch and take it to market. This accounts for the crediting of quantities and values principally to large ports upon the lakes, as shown in the table relating to markets.

In the tables of comparison between 1889 and 1880 the figures for the latter year will be found to differ somewhat from those given in the published reports so far as Lakes Huron, Saint Clair, and Erie are concerned, although the aggregate figures for these lakes are the same as already issued. In explanation of this matter it may be stated that it is found that in 1880 the statistics of portions of Lake Erie were for certain reasons included with the figures for Lakes Huron and Saint Clair, thus increasing the fishery interests of one lake at the expense of the other contiguous lakes. In the tables here presented this arrangement has been modified so that each lake is credited with the statistics which properly belong to it.

II.—LAKE SUPERIOR FISHERIES.

The fisheries of this lake are carried on in 3 counties in the state of Minnesota, 7 counties in the state of Michigan, and 2 counties in the state of Wisconsin.

On the north shore of Lake Superior, embracing Saint Louis, Lake, and Cook counties, Minnesota, fishing is prosecuted at any point in the lake where the water is not too deep from the distance of one-fourth of a mile to 10 miles off shore. Very little fishing is done on the north shore with seines, most of the fishing being carried on with gill nets with meshes of 4.5 or 5.5 inches in the spring and summer and with hooks and lines through holes in the ice in the winter. This hook-and-line fishing in the winter for trout has not been carried on to any extent during the past few years. All the fish caught in this section are sold to Duluth dealers, and principally to one who runs a line of tugs for the purpose of collecting fish. They are shipped from Duluth to points west and south, to the southern part of Minnesota, and to Iowa, Dakota, Montana, Idaho, Oregon, and Washington. The demand for whitefish is always more than the supply, except perhaps during the month of November. Some few whitefish are sold by peddlers, but most of the catch is sold to dealers, who ship them, as above stated, hardly retaining enough to supply the local demand. The dealers say that a number of Americans fish in Canadian waters and bring in large quantities of fish, and that they can get whitefish from them at times when they can not be obtained here at any price.

The information of local fishermen on the work of the United States Fish Commission in Saint Louis county, Minnesota, is that much good has been done and the catch, especially of whitefish, considerably increased. The fishermen claim that they are able to judge accurately of the benefit done them by the hatching and distribution of whitefish for the reason that, as the

ova used at the Duluth, Minnesota, hatcheries are obtained from Lakes Erie and Michigan, the fish are different and can readily be distinguished from those native to those waters. They say that the fish from Lakes Erie and Michigan are lighter in color and rarely weigh over 4.5 pounds, while Lake Superior whitefish often weigh as much as 16 pounds. The catch in 1889 was lighter than for many years previous. The species are whitefish, trout (including the deep-water variety, known as siscowet), herring, wall-eyed pike, pickerel, and sturgeon. There are, however, very few sturgeon taken here, and those are small, averaging about 50 pounds.

The nationality of the fishermen is principally American, Norwegian, and Swedish. The fishermen on the north shore of Lake Superior are thrifty and progressive, and many of them have taken out homesteads and have their families with them.

In Alger, Chippewa, and Marquette counties, Michigan, fishing is done principally by large firms from other places. The apparatus used consists of gill nets, pound nets, and a few seines, the latter being used only in Chippewa and Marquette counties. The catch in Alger county includes bass, catfish, herring, perch, pike and pickerel, suckers, trout, and whitefish. In Chippewa county it includes herring, perch, pike and pickerel, sturgeon, trout, and whitefish; in Marquette county, herring, trout, and whitefish. The fishermen are French Canadians, Indians, and Americans, with a few Norwegians and Swedes.

In Baraga county, Michigan, the apparatus used consists principally of gill nets and pound nets, the catch being trout and whitefish. In Houghton county, Michigan, the apparatus used is principally gill nets, pound nets, and seines. The catch includes herring, pike and pickerel, trout, and whitefish. The fishermen are, with few exceptions, Americans, Indians, Canadians, Norwegians, Swedes, Germans, and Finns. The best fishing grounds in Keweenaw bay have been destroyed by the refuse from sawmills. In Keweenaw county most of the fishermen are Americans, Finns, and Canadians. The fishing grounds are being gradually but surely ruined by sawdust, etc. In Ontonagon county, Michigan, hooks and lines, gill nets, seines, fyke nets, and pound nets are used. The catch consists of sturgeon, trout, and whitefish. The whitefish have greatly decreased in number during the last eight years. The fishermen are chiefly Americans, Indians, Norwegians, and Swedes.

In Bayfield and Douglas counties, Wisconsin, the apparatus used consists principally of hooks and lines, gill nets, seines, and pound nets. The catch is made up of herring, pickerel, trout (including the deep-water variety, known as siscowet), wall-eyed pike, and whitefish. The fishermen are mainly Americans, Indians, Swedes, Norwegians, and Canadians.

CAPITAL INVESTED.

The capital invested in the Lake Superior fisheries is shown in the subjoined table. It is given in detail by states and counties for land, buildings, and wharves, vessels, boats and apparatus, and other investments.

CAPITAL INVESTED IN LAKE SUPERIOR FISHERIES.

STATES AND COUNTIES.	Total.	Land, buildings, and wharves.	Vessels.	Boats and apparatus.	Other investments.
Total.....	\$210,825	\$28,743	\$27,350	\$152,998	\$1,734
Michigan.....	135,581	25,597	18,350	90,715	919
Alger.....	4,207	245		3,915	47
Baraga.....	5,657	355		5,197	105
Chippewa.....	74,340	22,548	8,550	43,188	54
Houghton.....	18,574	998		17,369	216
Keweenaw.....	3,609	216		3,356	37
Marquette.....	21,269	785	9,500	10,299	385
Ontonagon.....	7,925	460		7,400	75
Minnesota.....	34,585	1,072	5,500	27,489	524
Cook.....	5,202	270		4,737	195
Lake.....	2,737	60		2,606	71
Saint Louis.....	26,646	742	5,500	20,146	258
Wisconsin.....	40,659	2,074	3,500	34,794	291
Bayfield.....	40,647	2,074	3,500	34,782	291
Douglas.....	12			12	

Of the whole amount of capital invested, or \$210,825, the land, buildings, and wharves represented 13.64, vessels 12.97, boats and apparatus 72.57, and other investments 0.82 per cent. Nearly two-thirds of the capital invested is credited to the state of Michigan.

VESSELS.

It will be seen from the following table that all the vessels engaged in the Lake Superior fisheries were steamers, and that none were included that were under 5 tons net measurement. Besides the 9 vessels mentioned in the table, the Annie Clark, of Collingwood, and the Othello, of Owens Sound, Canada, were owned by American fishermen.

NAME, HOME PORT, RIG, AND NET TONNAGE OF VESSELS ENGAGED IN LAKE SUPERIOR FISHERIES.

STATES AND COUNTIES.	Name of vessel.	Home port.	Rig.	Net tonnage.
Total.....				111.66
Michigan.....				67.18
Chippewa.....	Richard P. Endress.....	Marquette, Michigan.....	Steamer.....	15.53
Do.....	Peter Coates.....	Grand Haven, Michigan.....	do.....	20.15
Do.....	Flora.....	Marquette, Michigan.....	do.....	5.52
Marquette.....	Rose.....	do.....	do.....	5.47
Do.....	Ethel J.....	do.....	do.....	10.58
Do.....	City of Marquette.....	do.....	do.....	9.93
Minnesota.....				26.29
Saint Louis.....	Henry F. Brower.....	Duluth, Minnesota.....	do.....	15.06
Do.....	J. W. Eviston.....	do.....	do.....	11.23
Wisconsin.....				18.19
Bayfield.....	R. W. Currie.....	Chicago, Illinois.....	do.....	18.19

The total net tonnage of the vessels employed in the Lake Superior fisheries is 111.66, of which Michigan has 67.18, Minnesota 26.29, and Wisconsin 18.19. Of the 6 Michigan vessels, 1 was built in 1871, 1 in 1882, 1 in 1884, 1 in 1885, and 2 in 1886. 1 Minnesota vessel was built in 1872 and 1 in 1882, and the Wisconsin vessel was built in 1882. Of the whole number engaged upon the lake, 1 was built in 1871, 1 in 1872, 3 in 1882, 1 in 1884, 1 in 1885, and 2 in 1886. The present value of the 6 Michigan steamers is \$18,350, of the 2 Minnesota steamers \$5,500, and of the Wisconsin steamer \$3,500, or a total for the lake of \$27,350, of which nearly two-thirds is owned in Michigan.

Considering the number of months fished and employment for the balance of the year, it is found that the 6 Michigan steamers fished for 36 months, or one-half of the time, 5 vessels were unemployed for 26 months, while 1 vessel was engaged in freighting for 10 months. The 2 Minnesota vessels were engaged in fishing for 10 months, or five-twelfths of the time; 1 vessel was unemployed for 6 months, and 1 was engaged in harbor work for 8 months. The Wisconsin vessel was engaged in fishing 4 months and in freighting 8 months. Taking the totals for the lake, it is found that the 9 steamers fished for 50 months, or 46.30 per cent of the entire time, and were unemployed or engaged in other business for 58 months, or 53.70 per cent of the time. 6 vessels were unemployed for an aggregate of 32 months, 2 were engaged in freighting for 18 months, and 1 in harbor work for 8 months.

BOATS AND APPARATUS.

The number and value of the principal kinds of boats and apparatus used in lifting fish from the water in the Lake Superior fisheries are given in the table below:

NUMBER AND VALUE OF BOATS AND APPARATUS USED IN LAKE SUPERIOR FISHERIES.

STATES AND COUNTIES.	Total value of boats and apparatus.	SAILBOATS.		OTHER BOATS.		GILLNETS.	SEINES.		FYKE NETS.		POUND NETS.		PILE DRIVERS.		Other apparatus.
		Number.	Value.	Number.	Value.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	
Total	\$152,998	250	\$24,010	204	\$5,621	\$72,624	36	\$3,694	2	\$100	210	\$36,810	21	\$937	\$9,71
Michigan	90,715	140	13,415	96	2,445	41,383	21	1,584	2	100	115	23,785	21	937	6,9
Alger	3,915	10	750	11	175	1,305					10	1,425	6	82	1
Baraga	5,197	11	700	2	50	1,825					8	2,425	1	15	1
Chippewa	43,188	35	4,500	39	1,159	18,413	4	650	1	15	50	14,350	14	810	3,2
Houghton	17,300	47	4,395	26	676	9,339	8	459			12	1,910			5
Keweenaw	3,356	14	965	7	95	1,731					3	275			1
Marquette	10,299	8	605			6,850	2	110			2	300			2,4
Ontonagon	7,400	15	1,440	11	290	1,920	7	365	1	175	30	3,100			2
Minnesota	27,489	52	5,690	60	875	15,890	6	930			15	2,820			1,1
Cook	4,737	8	750	11	255	2,784					3	600			
Lake	2,606	7	695	8	100	1,690									
Saint Louis	20,146	37	4,245	41	520	11,416	6	930			12	2,220			
Wisconsin	34,794	58	4,905	48	2,391	15,351	9	580			80	10,205			1,
Bayfield	34,782	58	4,905	47	2,296	15,351	8	575			80	10,205			1,
Douglas	12			1	5		1	5							

Of the value of boats and apparatus, viz, \$152,998, nearly one-half is invested in gill nets, nearly one-quarter in pound nets, and about one-fifth in boats and pile drivers.

PRODUCTS.

The various kinds of fish taken in the Lake Superior fisheries, with the quantity in pounds and value, are given in the following table:

QUANTITY AND VALUE OF FISH CAUGHT IN LAKE SUPERIOR.

STATES AND COUNTIES.	TOTAL.		BASS.		CATFISH.		HERRING.		PERCH.		PIKE AND PICKEREL.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	7,883,949	\$280,807	80	\$5	500	\$11	382,123	\$5,002	27,500	\$447	122,055	\$4,271
Michigan	4,862,065	191,149	50	3	400	8	87,200	1,425	27,550	445	88,180	3,101
Alger	129,810	5,082	50	3	400	8	7,200	166	200	4	1,810	57
Baraga	139,509	6,667										
Chippewa	2,897,228	113,451					15,500	408	27,350	441	86,050	3,030
Houghton	600,166	25,353					15,000	300			100	3
Keweenaw	77,284	2,926					5,500	169			220	11
Marquette	786,600	29,717					44,200	442				
Ontonagon	231,477	7,953										
Minnesota	1,394,131	41,081					66,958	1,572			16,300	565
Cook	192,266	5,529					11,600	232				
Lake	218,222	5,559					15,700	414				
Saint Louis	983,643	29,993					39,658	926			16,300	565
Wisconsin	1,027,753	48,577	30	2	100	3	227,965	2,065	40	2	17,575	605
Bayfield	1,027,753	48,487	30	2	100	3	227,965	2,065	40	2	17,575	605
Douglas	2,000	90										

STATES AND COUNTIES.	STURGEON.		BUCKERS.		TROUT.		WHITEFISH.		OTHER SPECIES.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	81,469	\$1,931	800	\$20	3,366,724	\$112,516	3,898,558	\$156,572	1,050	\$32
Michigan	83,469	1,926	200	2	1,837,641	67,965	2,736,325	116,251	1,050	32
Alger			200	2	25,500	1,340	84,450	3,501		
Baraga					38,350	1,683	101,150	4,984		
Chippewa	79,080	1,849			1,088,316	39,267	1,599,032	68,326	1,000	30
Houghton					289,050	11,522	296,016	13,518		
Keweenaw	11	1			57,500	2,129	14,200	674	50	2
Marquette					299,500	10,780	442,900	18,495		
Ontonagon	4,375	66			29,425	1,134	137,677	6,753		
Minnesota			500	15	1,039,226	31,469	211,147	7,460		
Cook					163,116	4,796	17,550	501		
Lake					200,322	5,073	2,200	66		
Saint Louis			500	15	735,788	21,594	191,207	6,893		
Wisconsin	1,000	15	100	2	429,857	13,082	951,086	32,891		
Bayfield	1,000	15	100	2	429,857	13,082	949,086	32,771		
Douglas							2,000	90		

The total value of the products of the Lake Superior fisheries is \$280,807. Of this the greater part was for trout and whitefish, the combined value of these two products being \$269,088, leaving but \$11,719 for all the other kinds of fish included in the table.

The average value per pound for each species was as follows: bass, 6.3 cents; catfish, 2.2 cents; herring, 1.3 cents; perch, 1.6 cents; pike and pickerel, 3.5 cents; sturgeon, 2.3 cents; suckers, 2.5 cents; trout, 3.3 cents; whitefish, 4 cents; other species, 3 cents. Considering all kinds of fish, the 7,883,949 pounds were worth when lifted from the water 3.6 cents per pound.

NATIONALITY OF EMPLOYING FISHERMEN.

The meaning of the term employer has been previously explained. It includes those fishermen having capital invested, and also those who take a portion of the catch in return for their services. The other fishermen receive wages which are not dependent upon the quantity of the catch. In order that there may be no misunderstanding in the reading of the tables which follow relating to nationality the employers have been designated as employing fishermen and those working for wages, whether fishermen or shore help, as wage-earning fishermen.

As regards employing fishermen, wage-earning fishermen, and wage-earning shore help, the numbers are given by states and counties for the leading nationalities.

NATIONALITY OF EMPLOYING FISHERMEN ENGAGED IN LAKE SUPERIOR FISHERIES.

STATES AND COUNTIES.	TOTAL.			UNITED STATES.		Canada and provinces.	Norway and Sweden.	Germany.	Great Britain.	France.	Finland.
	All countries.	United States.	Foreign countries.	White.	Indian.						
Total.....	399	250	149	215	35	26	76	7	2	1	37
Michigan.....	197	115	82	88	27	15	31	4	2	1	29
Alger.....	24	16	8	15	1	7	1				
Baraga.....	13	4	9	2	2	2	7				
Chippewa.....	48	45	3	23	22	3					
Houghton.....	62	14	48	13	1	1	18	3	1		25
Keweenaw.....	16	9	7	9		2			1		4
Marquette.....	12	8	4	8			4				
Ontonagon.....	22	19	3	18	1		1	1		1	
Minnesota.....	94	46	48	45	1	6	32	2			8
Cook.....	12	9	3	8	1	1	2				
Lake.....	10	4	6	4			5	1			
Saint Louis.....	72	33	39	33		5	25	1			8
Wisconsin.....	108	89	19	82	7	5	13	1			
Bayfield.....	104	85	19	78	7	5	13	1			
Douglas.....	4	4		4							

Of the 399 employing fishermen, 250, or 62.66 per cent, are of American nationality, while 149, or 37.34 per cent, are of foreign citizenship.

Of the 390 wage-earning fishermen and shore help, 239, or 61.28 per cent, are of American nationality, while 151, or 38.72 per cent, are citizens of foreign countries. A column is given showing the total amount earned by or paid to employes in 1889. The subject of wages is considered hereinafter in the discussion of the table headed "Profits and earnings".

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN AND SHORE HELP.

In the table which follows a classification is made of the average monthly wages paid to wage-earning fishermen and shore help in the Lake Superior fisheries, there being a further classification of fishermen and shore help and a specification by states and counties.

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN AND SHORE HELP ENGAGED IN LAKE SUPERIOR FISHERIES.

STATES AND COUNTIES.	Total.	Under \$20.	\$20 but under \$30.	\$30 but under \$40.	\$40 but under \$50.	\$50 but under \$60.	\$60 and over.
Total.....	390	6	18	51	108	159	48
FISHERMEN.							
Michigan.....	214	4	10	39	47	99	15
Alger.....	9		1	6	2		
Baraga.....	4			4			
Chippewa.....	111		4	5	23	77	2
Houghton.....	31	1	5	18	1	6	
Keweenaw.....	7			3	4		
Marquette.....	21	3				5	13
Ontonagon.....	31			3	17	11	
Minnesota.....	68	2	8	6	22	21	9
Cook.....	11		6		5		
Lake.....	3			1	2		
Saint Louis.....	54	2	2	5	15	21	9
Wisconsin.....	81			6	39	22	14
Bayfield.....	81			6	39	22	14
Douglas.....							
SHORE HELP.							
Michigan.....	27					17	10
Chippewa.....	17					17	
Marquette.....	10						10

It will be noticed that 159 out of 390 wage-earning fishermen and shore help receive on an average monthly wages amounting to \$50 but under \$60, while 108 receive \$40 but under \$50.

EXPENSES.

As has been previously explained, the items of expense in the following table include the cost of provisions, fuel, outfit, etc., being outlays that are necessarily incurred in the prosecution of the industry.

COST OF PROVISIONS, OUTFIT, ETC., IN LAKE SUPERIOR FISHERIES.

Michigan:		Minnesota:	
Alger.....	\$212	Cook.....	\$109
Baraga.....	655	Lake.....	495
Chippewa.....	12,759	Saint Louis.....	4,538
Houghton.....	1,634	Total.....	5,442
Keweenaw.....	239	Wisconsin:	
Marquette.....	2,456	Bayfield.....	3,054
Ontonagon.....	1,505		
Total.....	19,460	Grand total.....	27,956

PROFITS AND EARNINGS.

The profits of employing fishermen and the earnings of the wage-earning fishermen and shore help are next given. After the amount spent for wages and the expenses just considered are subtracted from the sum obtained for the catch, the balance goes to the employing fishermen and may be considered as "profits". It should be borne in mind that the average time employed is but 46.30 per cent, or less than one-half of the entire year.

PROFITS AND EARNINGS OF PERSONS ENGAGED IN LAKE SUPERIOR FISHERIES.

STATES AND COUNTIES.	EMPLOYING FISHERMEN.		WAGE-EARNING FISHERMEN AND SHORE HELP.		STATES AND COUNTIES.	EMPLOYING FISHERMEN.		WAGE-EARNING FISHERMEN AND SHORE HELP.	
	Number of owners and partners.	Profits.	Number.	Earnings.		Number of owners and partners.	Profits.	Number.	Earnings.
Total.....	399	\$167,830	390	\$85,021	Minnesota.....	94	\$25,935	68	\$9,704
Michigan.....	197	107,472	241	64,217	Cook.....	12	3,331	11	1,789
Alger.....	24	3,927	9	943	Lake.....	10	4,460	3	604
Baraga.....	13	5,412	4	600	Saint Louis.....	72	18,144	54	7,311
Chippewa.....	48	58,925	128	41,767	Wisconsin.....	108	34,423	81	11,100
Houghton.....	62	19,412	31	4,307	Bayfield.....	104	34,333	81	11,100
Keweenaw.....	16	2,002	7	685	Douglas.....	4	99		
Marquette.....	12	15,363	31	11,958					
Ontonagon.....	22	2,491	31	3,957					

Taking the totals for the lake, it is found that the average annual profits of each employing fisherman is \$420.63 and the average annual earnings of each wage-earning fisherman or shore help \$218. This is equivalent, on the basis of six months' employment, to a monthly profit of \$70.10 and average monthly earnings of \$36.33.

FOOD-FISH PREPARATION.

In the succeeding table the total fish product is classified under the following headings: "Fish sold fresh", "Fish packed in ice and frozen fish", and "Pickled fish". Quantities and values are given for each classification in connection with the specification by states and counties.

FOOD-FISH PREPARATION.—LAKE SUPERIOR.

STATES AND COUNTIES.	TOTAL.		FISH SOLD FRESH. (a)		FISH PACKED IN ICE AND FROZEN FISH.		PICKLED FISH.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total.....	7,883,949	\$280,807	2,302,029	\$80,018	3,765,476	\$142,570	1,816,444	\$58,219
Michigan.....	4,862,065	191,149	1,033,074	40,347	2,952,050	116,760	876,941	34,042
Alger.....	129,810	5,082	78,910	2,805	4,500	182	46,400	2,095
Baraga.....	139,500	6,667	94,450	4,515	25,050	1,252	20,000	900
Chippewa.....	2,897,228	113,451	414,428	15,342	2,177,500	86,850	305,900	11,259
Houghton.....	600,166	25,353	267,066	11,860			333,100	13,453
Keweenaw.....	77,284	2,926	29,584	1,183			47,700	1,743
Marquette.....	786,600	29,717	41,600	1,241	745,000	28,476		
Ontonagon.....	231,477	7,953	107,036	3,401			124,441	4,552
Minnesota.....	1,394,131	41,081	239,680	9,023	813,426	25,810	341,025	6,248
Cook.....	192,266	5,529			160,266	4,984	32,000	545
Lake.....	218,222	5,559	16,687	700	92,855	3,309	108,700	1,550
Saint Louis.....	983,643	29,993	223,013	8,323	560,305	17,617	200,325	4,153
Wisconsin.....	1,027,753	48,577	1,029,275	30,648			598,478	17,929
Bayfield.....	1,025,753	48,487	1,029,275	30,648			596,478	17,839
Douglas.....	2,000	90					2,000	90

^a Includes fish subsequently smoke-cured.

Of the total quantity of fish caught, viz, 7,883,949 pounds, 29.20 per cent was sold fresh, 47.76 per cent packed in ice or frozen, and 23.04 per cent pickled. Of the total value of the fish, \$280,807, fish sold fresh represented 28.50 per cent, fish packed in ice or frozen fish 50.77 per cent, and pickled fish 20.73 per cent.

III.—LAKE MICHIGAN FISHERIES.

The fisheries of Lake Michigan are carried on in 2 counties in the state of Illinois bordering upon that lake, 2 counties similarly situated in Indiana, 19 counties in Michigan, and 11 counties in Wisconsin.

In Cook county, Illinois, the apparatus used consists principally of hooks and lines, gill nets, and pound nets. The catch includes buffalo fish, carp, eels, herring, lawyers, muskellunge, perch, pickerel, sheepshead, sturgeon, suckers, trout, wall-eyed pike, and whitefish, which is all sold in Chicago either fresh or smoked. There has been a great falling off in the number of trout and whitefish since 1880. The fishermen are principally Americans, Norwegians, Swedes, and Germans. In Lake county, Illinois, gill nets, trap nets, pound nets, and seines are used. The catch covers perch and whitefish and is sold at Waukegan and Chicago. A decrease in whitefish has been noticed since 1885.

In Allegan county, Michigan, the species taken are herring, perch, sturgeon, suckers, whitefish, and trout. They are caught with gill nets, pound nets, hand lines, trawl lines, and spears, and find a market at Petoskey, Charlevoix, and South Haven. In Berrien county gill nets, pound nets, and seines are used to take herring, sturgeon, pike and pickerel, trout, and whitefish, which are sold fresh in Chicago. A few trawl lines and trammel nets are also set. Americans and French form the fishing population. In Benzie county gill nets and pound nets are employed in the capture of herring, sturgeon, trout, and whitefish, which are sold fresh in local markets and at Chicago. About two-fifths of the yield are trout and about one-third whitefish. In Charlevoix county the catch consists of herring, sturgeon, trout, and whitefish. The fishermen in Delta county are mostly Americans, Norwegians, and Swedes, but the number has decreased greatly since 1880. They use hand lines, gill nets, seines, fyke nets, and pound nets, and take herring, pickerel, pike, sturgeon, perch, whitefish, and trout. In Emmet county whitefish are decreasing, the catch being about one-half that of 1880. The fishermen are Americans and Indians. Trout and whitefish are packed in ice. The catch has fallen off greatly in Mackinac county since 1880. Americans, Canadians, Indians, Norwegians, Swedes, Germans, and one native of the West Indies carry on the industry. In Manistee county whitefish are decreasing and trout increasing. Of the catch 61.31 per cent are trout, 14.44 per cent herring, 6.32 per cent sturgeon, and 17.93 per cent whitefish. In Manitou county the product is said to be only one-quarter what it was in 1880. The fishermen are composed of Americans, Norwegians, Swedes, Danes, and Indians. In Mason county the catch consists of pike and pickerel, sturgeon, trout, and whitefish. The fishermen are made up wholly of natives of Norway, Sweden, Germany, and Finland. In Menominee county the principal species is herring. Americans, Norwegians, Swedes, Germans, Irish, and Poles carry on the industry. Whitefish and sturgeon are the principal fish obtained in Muskegon county. About four-fifths of the fishermen are Americans, the remainder being natives of Norway and Sweden. In Oceana county the fishermen are, with one exception, Americans. The whitefish nearly disappeared in 1884 and 1885 on account of sawdust, but since the enforcement of the law against the liberation of sawdust in the rivers entering the lake they have again commenced to increase rapidly. About two-fifths of the catch are whitefish, less than one-fifth trout, nearly one-third sturgeon, and the balance pike, pickerel, and herring. The output is said to be about one-third of what it was in 1880. In Ottawa county more than three-fourths of the yield are lake herring, a considerable quantity being smoked before sending to market. In Van Buren county the catch consists of herring, perch, sturgeon, suckers, trout, and whitefish. The fishermen are all Americans.

The fisheries of Kenosha county, Wisconsin, are only half as extensive as they were in 1880. The whitefish disappeared seven years ago. The product, consisting of catfish, ciscos, sturgeon, suckers, lawyers, trout, whitefish, and yellow perch, is nearly all packed in ice and shipped to Chicago. In Kewaunee county trout is the chief species and is quite plentiful, whitefish being

very scarce. Twenty years ago whitefish were abundant and trout scarce. The fishermen, mostly Americans and Swedes, employ gill nets. In Marinette county the catch is mainly herring, with some trout and sturgeon and a very few whitefish. The other varieties are bass, perch, pike and pickerel, and suckers. In Manitowoc county some 16 varieties of food fish are caught in pound nets and gill nets, principally by American and Canadian fishermen. Whitefish are said to have disappeared from Milwaukee county about five years ago. About 15 varieties of food fish are still caught there, chiefly by Americans, Germans, and Danes. The catch is shipped almost entirely to Chicago, but little being sold in Milwaukee. Bass, catfish, herring, perch, pike, sturgeon, suckers, trout, and whitefish caught in seines, fyke, gill, and pound nets, principally by Americans, Norwegians, Swedes, and Germans, form the fishing industry in Oconto county. In Ozaukee county fishing with gill nets has doubled and fishing with pound nets has fallen off about three-quarters. Americans, who make up the total number of fishermen, catch some dozen species, which are mostly packed in ice and shipped to Chicago. The whitefish disappeared from Racine county in 1882. More than a dozen kinds of food fish are caught by Americans, Scandinavians, and Germans and sold in Chicago. In Sheboygan county the catch is nearly three-fourths herring, over one-fourth trout, besides small quantities of sturgeon and whitefish, which are sold principally in local markets.

CAPITAL INVESTED.

The respective amounts invested in land, buildings, and wharves, vessels, boats and apparatus, and included under the general heading of "Other investments", with specification as regards states and counties, are shown in the subjoined table:

CAPITAL INVESTED IN LAKE MICHIGAN FISHERIES.

STATES AND COUNTIES.	Total.	Land, build- ings, and wharves.	Vessels.	Boats and appara- tus.	Other invest- ments.	STATES AND COUNTIES.	Total.	Land, build- ings, and wharves.	Vessels.	Boats and appara- tus.	Other invest- ments.
Total	\$716,549	\$82,871	\$165,400	\$147,780	\$20,498	Michigan—Cont'd.					
Illinois	30,105	11,100	7,000	17,005	100	Manistee	\$6,800	\$20		\$6,780	
Cook	31,560	10,915	7,000	13,545	100	Manitou	28,847	415		28,432	
Lake	4,545	185		4,360		Mason	3,674	50	\$1,500	2,090	\$25
Indiana	22,750	515	7,000	15,144	100	Menominee	20,580	3,665		16,553	362
Laporte	22,602	505	7,000	14,007	100	Muskegon	5,749	130		5,619	
Porter	167	10		147		Oceana	3,003	90		2,913	
Michigan	408,045	45,651	103,400	245,276	14,618	Ottawa	26,779	515	13,000	13,264	
Allegan	3,250			3,250		Schoudercraft	56,330	8,900	22,000	23,950	1,480
Antrim	4,461	50		4,401		Van Buren	3,830	150	2,000	1,680	
Benzon	20,758	725	6,000	14,013	20	Wisconsin	248,740	25,005	48,000	169,455	5,680
Berrien	33,757	1,195	9,000	22,531	131	Brown	20,738	3,910		24,878	920
Charlevoix	21,945	465	14,000	7,430	50	Door	53,547	7,649	4,000	39,634	2,364
Delta	56,274	12,179	15,500	27,030	665	Kenosha	11,688	1,000	5,000	4,938	150
Emmet	49,270	6,555	10,500	11,700	11,515	Keweenaw	4,518	131		4,330	48
Grand Traverse	6,450			6,450		Manitowoc	18,133	470		17,530	133
Iscelaw	10,326	425		9,901		Marquette	6,007	280		6,117	510
Mackinac	40,806	10,122		30,374	370	Milwaukee	49,507	2,650	22,000	24,357	500
						Oconto	35,003	7,055		28,008	780
						Ozaukee	6,122	425	1,500	4,152	45
						Racine	8,603	600	4,000	4,083	10
						Sheboygan	23,984	805	11,500	11,450	220

Michigan represents considerably more than one-half of the total capital invested, while Wisconsin has more than one-third. Of the entire capital invested, \$716,549, land, buildings, and wharves represent 11.57 per cent, vessels 23.08 per cent, boats and apparatus 62.49 per cent, and other investments 2.86 per cent.

VESSELS.

The fishing fleet of Lake Michigan consists of 48 vessels, all of which, with one exception, are steamers, the remaining vessel being a schooner. Illinois is credited with 1 steamer, Indiana with 2, Michigan with 29 steamers and 1 schooner, and Wisconsin with 15 steamers. The name, home port, rig, and net tonnage of each vessel are given in the following table :

NAME, HOME PORT, RIG, AND NET TONNAGE OF VESSELS ENGAGED IN LAKE MICHIGAN FISHERIES.

STATES AND COUNTIES.	Name of vessel.	Home port.	Rig.	Net tonnage.
Total				777.75
Illinois:				
Cook	C. W. Elphicke	South Chicago, Illinois	Steamer	26.00
Indiana				16.62
Laporte	Artie Ward	Grand Haven, Michigan	Steamer	5.51
Porter	Pearl B. Campbell	Chicago, Illinois	do	11.11
Michigan				526.06
Benzie	John Smith	Grand Haven, Michigan	Steamer	11.87
Do	Alice M. Campbell	do	do	14.88
Do	Maggie Lutz	Milwaukee, Wisconsin	do	8.14
Berrien	Charles E. Bird	Grand Haven, Michigan	do	9.46
Do	J. W. Hahn	do	do	17.88
Do	Sweet Bros	do	do	16.94
Do	A. McMillan	do	do	8.79
Charlevoix	Clara A. Elliot	do	do	13.67
Do	L. Q. Rawson	do	do	7.05
Do	Anspach	do	do	8.95
Do	Joseph Gordon	do	do	20.85
Do	Shriver Bros	do	do	11.31
Do	Minnie Warren	do	do	6.76
Do	James H. Martin	do	do	18.40
Delta	Oliver C. Williams	Marquette, Michigan	do	44.39
Do	Mary A. Gregory	Chicago, Illinois	Schooner	83.13
Do	Daisy Moore	Marquette, Michigan	Steamer	5.76
Do	Sarah B. Shipman	do	do	8.84
Emmet	J. W. Parmelee	Grand Haven, Michigan	do	15.33
Do	Leo	Chicago, Illinois	do	17.49
Do	Viola	do	do	16.70
Mason	Lida	Grand Haven, Michigan	do	6.79
Ottawa	Emma Bleecker	do	do	19.01
Do	Kaiser Wilhelm	do	do	18.46
Do	Charles H. Augur	do	do	13.34
Do	C. A. Meisters	do	do	11.60
Schoolcraft	William Maxwell	Chicago, Illinois	do	18.41
Do	Francis R. Anderson	do	do	15.41
Do	Lady Washington	Marquette, Michigan	do	46.86
Van Buren	Myrtle M. McCluer	Grand Haven, Michigan	do	9.59
Wisconsin				209.07
Door	L. P. Hill	Milwaukee, Wisconsin	Steamer	11.22
Kenosha	Fred. Engle	Grand Haven, Michigan	do	14.02
Do	Pottawattamie	Milwaukee, Wisconsin	do	11.78
Milwaukee	G. R. Green	do	do	12.27
Do	L. A. Schulz	do	do	15.91
Do	Dan Costello	do	do	19.52
Do	Arthur	do	do	18.40
Do	H. M. Van Ella	do	do	19.98
Do	Hannah Sullivan	Grand Haven, Michigan	do	14.28
Ozaukee	Maria B. M.	Milwaukee, Wisconsin	do	14.26
Racine	George R. West	Racine, Wisconsin	do	11.42
Sheboygan	Welcome	Milwaukee, Wisconsin	do	5.03
Do	Carrie Mather	do	do	14.90
Do	Hoffnung	do	do	10.75
Do	Fritz Karste	do	do	15.33

The total net tonnage of the 48 vessels is 777.75, of which Illinois should be credited with 26, Indiana with 16.62, Michigan with 526.06, and Wisconsin with 209.07. The present value of Illinois vessels is \$7,000, of Indiana vessels \$7,000, of Michigan vessels \$103,400, and of Wisconsin vessels \$48,000. The aggregate value of all vessels engaged in the Lake Michigan fisheries is \$165,400.

The subjoined table shows the number of the vessels of the fleet and the respective years in which they were built:

1866.....	1	1881.....	2
1869.....	1	1882.....	5
1871.....	2	1883.....	4
1872.....	1	1885.....	3
1873.....	3	1886.....	2
1874.....	5	1887.....	2
1875.....	1	1888.....	1
1876.....	3	1889.....	5
1877.....	3		
1879.....	2		
1880.....	2	Total.....	48

It will be seen that 24 vessels, or one-half, have been built since 1880, while but 1 vessel is more than 20 years old.

If 48 vessels were employed in fishing for the 12 months of the census year, the aggregate would have been 576 months. The actual conditions were as follows: 5 vessels were employed for the entire year, or 60 months; 8 vessels were engaged in fishing for 24 months and in towing for 72 months; 35 vessels were engaged in fishing for 271 months and were unemployed for 149 months. The aggregates are 355 months engaged in fishing, or 61.63 per cent of the entire year, and 221 months unemployed and engaged in other business, or 38.37 per cent. As the fishing season covered but a little more than three-fifths of the year, this fact should be considered as bearing upon the results shown by the other tables, especially as regards products, wages, expenses, and profits and earnings.

BOATS AND APPARATUS.

Both sailboats and rowboats are used in the fishing industry of Lake Michigan. The principal kinds of apparatus used are gill nets, seines, fyke nets, and pound nets. The number and value of each kind of apparatus, by states and counties, are given in the following table:

NUMBER AND VALUE OF BOATS AND APPARATUS USED IN LAKE MICHIGAN FISHERIES.

STATES AND COUNTIES.	Total value of boats and apparatus.	SAILBOATS.		OTHER BOATS.		GILL NETS.	SEINES.		FYKE NETS.		POUND NETS.		PILE DRIVERS.		OTHER APPARATUS.
		Number.	Value.	Number.	Value.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Value.
Total	\$47,780	603	\$44,326	476	\$9,736	\$184,742	48	\$4,489	1,171	\$17,291	856	\$171,146	146	\$8,053	\$7,967
Illinois	17,905	27	2,705	73	1,589	2,874	12	229	4	103	25	7,575	3	1,300	1,530
Cook	13,545	27	2,705	67	1,429	2,874	12	229	4	103	12	3,675	2	1,000	1,530
Lake	4,360			6	160						13	3,900	1	300	
Indiana	15,144	4	465	10	407	5,129	3	340			18	6,100	4	1,075	1,628
Laporte	14,997	3	450	8	395	5,129	3	340			15	6,000	4	1,075	1,608
Porter	147	1	15	2	12						3	100			20
Michigan	245,276	386	25,794	171	3,477	94,475	8	980	5	250	581	114,706	92	3,968	1,626
Allegan	3,250	9	525	7	30	525					14	2,100		65	5
Antrim	4,401	5	275	23	545	641					26	2,860	4	80	
Benzie	14,013	4	700			12,213					5	1,000			100
Berrien	22,531	6	365	7	180	17,315	1	30			18	4,400	3	90	151
Charlevoix	7,430	13	565	1	15	5,720					7	1,100	1	30	
Delta	27,930	90	8,865	4	145	7,980	6	850	5	250	50	10,590	16	840	410
Emmet	11,706	16	925	18	235	6,625					27	3,920			
Grand Traverse	6,450	20	755	1	20						49	5,650	1	25	
Leelanaw	9,901	50	1,860	11	210	3,015					30	4,776	3	40	
Mackinac	36,374	38	3,044	33	807	3,323					126	27,795	23	965	440
Manistee	6,780	10	430	5	70	5,475					5	775	1	20	10
Manitou	28,432	59	4,495	3	130	8,182					57	14,925	17	700	
Mason	2,099	3	70	9	130	1,489					2	400			10
Menominee	16,553	21	1,475	4	125						48	14,165	17	788	
Muskegon	5,619	15	745	12	195	440					23	4,050			189
Oceana	2,913	5	260	7	145	188	1	100			11	2,200			20
Ottawa	13,264	12	1,115	22	400	9,593					12	2,050			106
Schoolcraft	23,950	9	1,250	2	50	11,600					55	10,550	6	325	175
Van Buren	1,680	1	75	2	45	150					7	1,400			10
Wisconsin	169,455	186	15,362	222	4,263	82,264	25	2,940	1,162	16,938	232	42,765	47	1,710	3,213
Brown	24,878	32	1,450	67	1,165	3,860	11	1,170	1,018	15,563	8	1,525	3	80	65
Door	39,534	61	4,747	42	1,006	23,102	3	800	103	770	48	7,740	12	305	1,064
Kenosha	4,938	2	100	3	45	4,183			2	10	2	500	1	50	50
Kewaunee	4,339	10	710			3,565									64
Manitowoc	17,530	19	1,410	5	160	8,000					23	7,400	4	460	100
Marinette	6,117	7	250	2	60	3,427			10	145	14	1,800			435
Milwaukee	24,367	10	3,300	50	765	19,180	1	30	2	15					1,067
Oconto	28,068	42	3,045	32	547	2,982	9	915	27	435	123	19,300	23	750	94
Ozaukee	4,162	1	160	5	125	3,000					2	800	1	40	37
Racine	4,083	1	150	3	60	3,700	1	25							148
Sheboygan	11,459	1	50	13	330	7,265					12	3,700	3	25	89

Of the whole amount invested in boats and apparatus, \$47,780, gill nets represent \$184,742 and pound nets \$171,146. These figures indicate plainly the principal means of capture in the Lake Michigan fisheries.

PRODUCTS.

In the table of products which follows, the principal fish caught are mentioned by name, together with the quantity in pounds and the aggregate value, by states and counties. The list of food fish includes bass, catfish, herring, perch, pike and pickerel, sturgeon, suckers, trout, whitefish, and other species.

QUANTITY AND VALUE OF FISH CAUGHT IN LAKE MICHIGAN.

STATES AND COUNTIES.	TOTAL.		BASS.		CATFISH.		HERRING.		PERCH.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	26,006,944	\$788,536	47,082	\$2,464	224,680	\$4,415	9,568,587	\$190,359	2,181,426	\$37,603
Illinois	732,830	24,007					77,450	2,977	591,300	17,486
Cook	705,330	23,102					77,450	2,977	577,300	17,166
Lake	27,500	905							14,000	320
Indiana	348,800	10,906					55,000	1,550	37,000	920
Laporte	330,800	10,566					50,000	1,500	32,000	870
Porter	18,000	340					5,000	50	5,000	50
Michigan	11,778,507	433,084	3,000	140	1,500	45	3,074,473	64,178	51,605	826
Allegan	43,500	1,958					2,900	87	1,200	44
Antrim	107,400	6,508					24,000	990		
Benzie	522,600	23,470					137,000	4,110		
Berrien	644,900	21,800					316,500	7,713		
Charlevoix	625,700	22,850					45,000	1,175		
Delta	1,102,655	30,748					152,483	3,259	29,005	387
Emmet	606,000	24,420					200,000	4,000	200	4
Grand Traverse	118,000	5,070					3,000	100		
Leelanaw	656,200	20,424					28,000	903		
Mackinac	1,377,800	51,937					30,650	843	500	10
Manistee	103,200	7,372					24,000	732		
Manitou	1,354,800	54,088								
Mason	58,800	2,040								
Menominee	1,592,450	25,030					1,503,000	22,140	15,100	161
Muskegon	189,200	9,767			1,500	45	27,000	685	3,000	150
Oceana	81,000	3,800					8,000	240		
Ottawa	740,500	24,720	3,000	140			564,840	17,027		
Schoolcraft	1,047,152	75,828								
Van Buren	23,500	987					7,500	195	2,000	80
Wisconsin	13,140,807	314,440	44,082	2,324	223,180	4,370	6,361,664	121,654	1,501,521	18,371
Brown	2,070,500	33,610	17,487	948	222,130	4,358	202,268	3,525	922,110	10,361
Door	2,492,110	73,331	20,195	1,004	500	5	1,210,641	17,317	172,627	1,310
Koshong	301,150	12,280			150	12	172,000	3,550	10,950	329
Kewaunee	124,743	5,700					4,000	55		
Manitowoc	407,475	15,802					66,725	2,002		
Marquette	378,400	6,121	1,500	75			304,120	3,513	4,000	40
Milwaukee	1,709,947	63,771					987,367	27,371	85,260	3,047
Oconto	2,010,077	40,087	4,000	207	400	15	2,292,673	30,966	290,374	3,068
Ozaukee	145,300	6,305					40,000	1,040		
Racine	212,900	8,450					105,700	3,243	7,200	216
Sheboygan	1,374,100	48,974					976,180	29,072		

QUANTITY AND VALUE OF FISH CAUGHT IN LAKE MICHIGAN—CONTINUED.

STATES AND COUNTIES.	PIKE AND PICKEREL.		STURGEON.		SUCKERS.		TROUT.		WHITEFISH.		OTHER SPECIES.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total.....	488,781	\$18,101	612,353	\$26,634	1,728,674	\$9,589	5,580,358	\$249,255	5,523,971	\$246,493	51,029	\$3,623
Illinois.....	500	30	8,200	410	650	21	25,000	1,500	17,375	888	12,355	785
Cook.....	500	30	8,200	410	650	21	25,000	1,500	3,875	213	12,355	785
Lake.....									13,500	675		
Indiana.....	1,000	50	85,400	4,154			150,400	9,032	20,000	1,200		
Laporte.....	1,000	50	79,400	3,974			150,400	9,032	18,000	1,140		
Porter.....			6,000	180					2,000	60		
Michigan.....	212,070	6,849	474,510	20,309	7,100	161	2,949,608	120,832	5,004,641	219,744		
Allegan.....			25,700	1,285	4,800	116	7,500	356	1,400	70		
Antrim.....							31,900	998	111,500	4,610		
Benzie.....			600	30			213,000	10,730	172,000	8,600		
Berrien.....	1,000	50	92,900	4,638			222,500	8,608	12,000	800		
Charlevoix.....			10,400	520			462,800	16,990	107,500	4,165		
Delta.....	187,920	5,632	71,945	2,679			201,645	7,941	450,057	19,850		
Emmet.....							298,400	12,820	167,400	7,605		
Grand Traverse.....							60,000	2,420	65,000	3,150		
Leelanaw.....			11,500	575			281,000	12,702	335,100	15,244		
Mackinac.....	50	2	54,590	1,628			177,870	6,129	1,114,200	43,325		
Manistee.....			10,500	525			101,900	4,625	29,800	1,490		
Manitou.....							229,500	9,370	1,125,300	45,318		
Muson.....	800	40	20,000	1,000			18,400	920	19,600	980		
Menominee.....							24,400	732	49,950	1,998		
Muskegon.....	18,800	950	56,400	2,820			8,400	402	74,100	4,705		
Oceana.....	1,100	55	26,200	1,310			12,300	615	33,400	1,670		
Ottawa.....	2,400	120	20,775	1,039	800	8	120,475	5,000	28,300	1,395		
Schoolcraft.....			69,500	2,085			484,618	19,324	1,093,034	54,419		
Van Buren.....			3,500	175	1,500	37	3,000	150	6,000	350		
Wisconsin.....	275,214	11,172	44,243	1,761	1,720,924	9,407	2,455,350	117,891	481,955	24,661	38,674	2,838
Brown.....	190,435	7,468	15,488	675	1,397,554	6,180			2,073	105	974	19
Door.....	17,829	474	18,485	599	1,000	20	671,737	32,584	378,402	20,004	700	14
Kenosha.....			600	30	50	1	101,500	5,075	72,100	3,245	3,800	38
Kewaunee.....							119,743	5,595	1,000	50		
Manitowoc.....							335,750	13,550	5,000	250		
Marquette.....	15,400	896	1,570	78	20,000	300	22,900	904	9,000	315		
Milwaukee.....					66,320	666	597,800	29,890			33,200	2,767
Oconto.....	51,550	2,334	7,800	361	236,000	2,210	4,600	227	12,780	609		
Ozaukee.....							105,000	5,250	300	15		
Racine.....							100,000	5,000				
Sheboygan.....			300	18			306,320	19,816	1,300	68		

The total catch amounted to 26,006,944 pounds, worth \$788,536, or an average of 3 cents per pound. The herring weighed 9,568,587 pounds, and were worth \$190,359, or 2 cents per pound; the trout represented 5,580,358 pounds, worth \$249,255 in the aggregate, or an average of 4.5 cents per pound; the whitefish catch aggregated 5,523,971 pounds, valued at \$246,493, or 4.5 cents per pound, the same as trout. Bass were worth on the average 5.2 cents per pound, catfish 2 cents, perch 1.7 cents, pike and pickerel 3.7 cents, sturgeon 4.3 cents, suckers 0.6 cent, and other species 7.1 cents per pound.

NATIONALITY OF EMPLOYING FISHERMEN.

The meaning of "employing" fishermen has been previously explained. The designation includes all those who depend upon the catch for their remuneration, some having money invested and others sharing in the catch although not having money actively invested in the industry. The nationalities are specified as regards each of the principal foreign countries represented, with details for states and counties.

NATIONALITY OF EMPLOYING FISHERMEN ENGAGED IN LAKE MICHIGAN FISHERIES.

STATES AND COUNTIES.	TOTAL.			UNITED STATES.		Canada and prov- inces.	Norway and Sweden.	Ger- many.	Great Britain.	Den- mark.	Po- land.	France.	Ire- land.	West Indies.	Fin- land.	Hol- land.	Bel- gium.
	All coun- tries.	United States.	Foreign coun- tries.	White.	In- dian.												
Total	1,313	719	594	680	30	93	206	132	3	21	8	4	4	1	8	4	20
Illinois.....	104	51	53	51			20	20	1	2	4						
Cook	98	45	53	45			20	20	1	2	4						
Lake	6	6		6													
Indiana.....	9	2	7	2				7									
Laporte	7		7					7									
Porter	2	2		2													
Michigan.....	621	450	165	428	28	18	96	26	1	1	2	4	4	1	8	4	
Allegan	11	11		11													
Antrim	10	10		10													
Benzie	11	11		11													
Berrien	30	27	3	27								3					
Charlevoix.....	25	25		25													
Delta	98	53	45	53		2	32	7	1			1	2				
Emmet	35	35		20	15												
Grand Traverse.....	21	21		21													
Leelanaw	72	52	20	52			16	3		1							
Mackinac	59	30	29	23	7	13	10	5						1			
Manistee	19	15	4	15			4										
Manitou	61	55	6	40	6		6										
Mason	15		15				3	4							8		
Monroe	23	4	19	4			10	5			2		2				
Muskegon.....	42	34	8	34			8										
Oceana	12	11	1	11			1										
Ottawa	52	41	11	41			6	1								4	
Schoolcraft.....	9	5	4	5		3		1									
Van Buren	7	7		7													
Wisconsin.....	570	210	360	208	2	75	174	79	1	18	2						20
Brown	107	86	21	84	2	1	17	2			1						
Door	231	61	170	61		12	117	20	1		1						19
Kenosha	8	6	2	6				2									
Kewaunee.....	16	7	9	7		3	4	2									
Manitowoc.....	21	11	10	11		8	1	1									
Marquette.....	56	1	55	1		47	8										
Milwaukee.....	50	12	47	12			5	28		14							
Oconto	51	9	42	9		4	20	15		2							1
Ozaukee	5	5		5													
Racine	11	5	6	5			1	3		2							
Shushoygan.....	14	7	7	7			1	6									

The whole number of employing fishermen is found to be 1,313, of whom 719, or 54.76 per cent, are of American nationality, while 594, or 45.24 per cent, are of various foreign nationalities.

NATIONALITY OF WAGE-EARNING FISHERMEN AND SHORE HELP.

A similar presentation to the one showing the nationalities of employing fishermen is given below for wage-earning fishermen and shore help:

NATIONALITY OF WAGE-EARNING FISHERMEN AND SHORE HELP ENGAGED IN LAKE MICHIGAN FISHERIES.

STATES AND COUNTIES.	TOTAL.			WAGE-EARNING FISHERMEN.					
	All countries.	United States.	Foreign countries.	All countries.	United States.		Canada and provinces.	Norway and Sweden.	Germany.
					White.	Indian.			
Total	771	492	279	736	435	33	42	107	93
Illinois	16	14	2	16	14				
Cook	14	12	2	14	12				
Lake	2	2		2	2				
Indiana	20	5	15	20	5			1	14
Laporte	19	4	15	19	4			1	14
Porter	1	1		1	1				
Michigan	483	376	107	476	336	33	28	50	16
Allegan	8	8		8	8				
Antrim	7	7		7	7				
Benzie	18	18		18	18				
Berrien	28	28		26	26				
Charlevoix	30	27	3	30	27				
Delta	54	32	22	54	32		2	18	2
Emmet	68	68		68	44	24			
Grand Traverse	21	20	1	21	20				1
Leelanaw	10	9	1	10	9				1
Mackinac	74	38	36	74	29	9	19	13	4
Manistee	7	7		7	7				
Manitou	41	39	2	41	39				
Mason									
Menominee	34	4	30	34	4			16	6
Muskegon	3	3		3	3				
Oceana	2	2		2	2				
Ottawa	24	23	1	24	23			1	
Schoolcraft	60	39	11	45	34		7	2	2
Van Buren	4	4		4	4				
Wisconsin	252	97	155	224	80		14	56	63
Brown	13	9	4	13	9			4	
Door	55	11	44	55	11		4	25	10
Kenosha	12	12		8	8				
Kewaunee	6		6	6			1	5	
Manitowoc	17	5	12	17	5		9	1	2
Marinette	6		6	6				6	
Milwaukee	37	14	23	28	12				16
Oconto	50	6	44	50	6			15	24
Ozaukee	8	8		5	5				
Racine	3	2	1	3	2				
Sheboygan	45	30	15	33	22				11

NATIONALITY OF WAGE-EARNING FISHERMEN AND SHORE HELP—CONTINUED.

STATES AND COUNTRIES.	WAGE-EARNING FISHERMEN--continued.					SHORE HELP.			Total amount earned by or paid to employes in 1889.
	Belgium.	Denmark.	France.	Ireland.	Poland.	All countries.	United States.	Foreign countries.	
Total.....	10	3	3	3	7	35	24	11	\$159,142
Illinois.....					2				2,405
Cook.....					2				2,245
Lake.....									160
Indiana.....									6,308
Laporte.....									6,338
Porter.....									60
Ireland.....		2	3	3	5	7	7		88,544
Allegan.....									590
Antrim.....									405
Benzle.....									5,190
Berrien.....						2	2		7,200
Charlevoix.....			3						4,275
Delta.....									5,751
Emmet.....									10,690
Grand Traverse.....									1,078
Lechuanaw.....									838
MacKinnac.....									10,837
Manistee.....									820
Manitou.....		2							5,300
Mason.....									
Menominee.....				3	5				4,275
Muskegon.....									1,080
Oceana.....									720
Ottawa.....									8,440
Schoolcraft.....						5	5		10,825
Van Buren.....									270
Wisconsin.....	10	1				28	17	11	61,795
Brown.....									1,017
Door.....	5								8,861
Kenosha.....						4	4		4,950
Koshong.....									800
Koshong.....									3,720
Manitowish.....									325
Marquette.....									14,940
Milwaukee.....						9	2	7	6,742
Oconto.....	5								2,500
Ozaukee.....						3	3		960
Racine.....		1							16,980
Sheboygan.....						12	8	4	

Of the whole number of wage-earning fishermen and shore help, 771, those of American nationality number 492, or 63.81 per cent, and those of the various foreign nationalities 279, or 36.19 per cent. The subject of wages is more fully considered under the presentation entitled "Profits and earnings".

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN.

The number of wage-earning fishermen and shore help in each state and county receiving specified monthly wages is shown in the following table:

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN AND SHORE HELP ENGAGED IN LAKE MICHIGAN FISHERIES.

STATES AND COUNTIES.	Total.	Under \$20.	\$20 but under \$30.	\$30 but under \$40.	\$40 but under \$50.	\$50 but under \$60.	\$60 and over.	STATES AND COUNTIES.	Total.	Under \$20.	\$20 but under \$30.	\$30 but under \$40.	\$40 but under \$50.	\$50 but under \$60.	\$60 and over.
Total	771	4	254	144	232	135	2	Michigan—Cont'd.							
FISHERMEN.								Ottawa	24					24	
Illinois	16		8	8				Schoolcraft	45			3			42
Cook	14		6	8				Van Buren	4				4		
Lake	2		2					Wisconsin	224	4	61	65	85	9	
Indiana	20		1			19		Brown	13	4	8	1			
Laporte	19					19		Door	55		11	33	11		
Porter	1		1					Kenosha	8					8	
Michigan	476		179	67	126	102	2	Kewaunee	6		2	4			
Allegan	8			8				Manitowoc	17		2			15	
Antrim	7		1	6				Marinette	6		6				
Benzie	18				16		2	Milwaukee	28					28	
Berrien	26			26				Oconto	50		31	17	2		
Charlevoix	30				30			Ozaukee	5			5			
Delta	54		54					Racine	3		1			2	
Emmet	68		7		1	60		Shelbygan	33			5	27	1	
Grand Traverse	21		20	1				SHORE HELP.							
Leelanaw	10			5	5			Michigan	7		2			5	
Mackinac	74		60	14				Berrien	2		2				
Manistee	7			5	2			Schoolcraft	5					5	
Manitou	41			2	39			Wisconsin	28		3	4	21		
Mason								Kenosha	4				2	2	
Menominee	34		34					Milwaukee	9				2	7	
Muskegon	3				3			Ozaukee	3		3				
Oceann	2				2			Shelbygan	12					12	

Of the 771 wage-earning fishermen and shore help but 4 receive less than \$20 per month, while 254 earn \$20 but under \$30 per month. Those earning \$30 but under \$40 per month number 144. There are 232 earning \$40 but under \$50 per month, 135 earning \$50 but under \$60 per month, while but 2 earn \$60 and over. As was stated in the case of the Lake Superior fisheries, the fishermen, when actively engaged, receive as a rule board and lodging in part payment of their wages.

EXPENSES.

The expenses, summarized by states and counties, in the following table include the cost of provisions, outfit, etc., for the census year, being of such a nature that the money must be expended or the industry could not be carried on.

COST OF PROVISIONS, OUTFIT, ETC., IN LAKE MICHIGAN FISHERIES.

ILLINOIS:		MICHIGAN—Continued.	
Cook.....	\$1,675	Oceana.....	\$18
INDIANA:		Ottawa.....	502
Laporte.....	3,220	Schoolcraft.....	7,245
Porter.....	105	Van Buren.....	60
Total.....	3,325	Total.....	25,057
MICHIGAN:		WISCONSIN:	
Allegan.....	250	Brown.....	880
Antrim.....	1,475	Door.....	4,450
Benzie.....	333	Kenosha.....	2,658
Berrien.....	908	Kewaunee.....	195
Charlevoix.....	766	Manitowoc.....	1,613
Delta.....	2,792	Marinette.....	547
Emmet.....	2,300	Milwaukee.....	14,206
Grand Traverse.....	200	Oconto.....	2,881
Leelanaw.....	225	Ozaukee.....	515
Mackinac.....	5,529	Racine.....	2,949
Manistee.....	530	Sheboygan.....	1,750
Manitou.....	400	Total.....	32,644
Mason.....	25	Grand total.....	62,701
Menominee.....	1,242		
Muskegon.....	257		

PROFITS AND EARNINGS.

The profits of employing fishermen and the earnings of wage-earning fishermen and shore help are next contrasted. The comparative figures are given for both classes of fishermen for each state and county.

PROFITS AND EARNINGS OF PERSONS ENGAGED IN LAKE MICHIGAN FISHERIES.

STATES AND COUNTIES.	EMPLOYING FISHERMEN.		WAGE-EARNING FISHERMEN AND SHORE HELP.		STATES AND COUNTIES.	EMPLOYING FISHERMEN.		WAGE-EARNING FISHERMEN AND SHORE HELP.	
	Number of owners and partners.	Profits.	Number.	Earnings.		Number of owners and partners.	Profits.	Number.	Earnings.
Total -----	1,313	\$566,693	771	\$159,142	Michigan—Continued				
Illinois -----	104	20,017	16	2,405	Manitou -----	61	\$48,988	41	\$5,300
Cook -----	98	19,182	14	2,245	Mason -----	15	2,916		
Lake -----	6	835	2	160	Menominee -----	23	19,513	34	4,275
Indiana -----	9	7,183	20	6,398	Muskegon -----	42	8,420	3	1,080
Laporto -----	7	7,008	19	6,338	Oceana -----	12	3,152	2	720
Porter -----	2	175	1	60	Ottawa -----	52	15,787	24	8,440
Michigan -----	621	319,483	483	88,544	Schoolcraft -----	9	48,758	50	19,825
Allegan -----	11	1,118	8	590	Van Buren -----	7	657	4	270
Antrim -----	19	4,628	7	465	Wisconsin -----	579	220,010	252	61,795
Benzie -----	11	17,947	18	5,100	Brown -----	107	31,722	13	1,017
Berrien -----	30	13,791	28	7,200	Door -----	231	60,020	55	8,861
Charlevoix -----	25	17,809	30	4,275	Kenosha -----	8	4,672	12	4,950
Delta -----	98	31,205	54	5,751	Kewaunee -----	16	4,705	6	890
Emmet -----	35	11,439	68	10,690	Manitowoc -----	21	10,469	17	3,720
Grand Traverse -----	21	3,492	21	1,978	Marinette -----	56	5,249	6	325
Leelanaw -----	72	28,361	10	838	Milwaukee -----	59	34,625	37	14,940
Mackinac -----	59	35,571	74	10,837	Oconto -----	51	30,464	50	6,742
Manistee -----	19	6,022	7	820	Ozaukee -----	5	3,290	8	2,500
					Racine -----	11	4,550	3	960
					Sheboygan -----	14	30,244	45	16,980

Considering the aggregates for the entire lake, it is found that the average annual profits of employing fishermen reach \$431.60, while the average annual earnings of wage-earning fishermen and shore help amount to \$206.41. As is well known, the fishing season does not cover the entire year. On the basis of 7.4 months engaged in the industry (61.63 per cent of the time), the average monthly profits were \$58.32 and the average monthly earnings \$27.89. It is seen that the employing fishermen, including those having capital invested and those fishing on a "lay", averaged a little more than twice as much for their share as did the wage-earning fishermen and shore help.

FOOD-FISH PREPARATION.

The three methods of food-fish preparation considered are fish sold fresh, fish packed in ice and frozen fish, and pickled fish. The quantity and value for each method of preparation by states and counties are shown in the following table:

FOOD-FISH PREPARATION.—LAKE MICHIGAN.

STATES AND COUNTIES.	TOTAL.		FISH SOLD FRESH. (a)		FISH PACKED IN ICE AND FROZEN FISH.		PICKLED FISH.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Grand total	26,006,944	\$788,536	15,531,114	\$444,391	5,904,372	\$229,295	4,571,458	\$114,850
Illinois	732,830	21,097	650,330	20,852	82,500	3,245		
Cook	705,330	23,102	650,330	20,852	55,000	2,250		
Lake	27,500	995			27,500	995		
Indiana	348,800	10,906	231,000	10,150	117,800	6,756		
Laporte	330,800	10,566	231,000	10,150	99,800	6,416		
Porter	18,000	340			18,000	340		
Michigan	11,778,507	433,084	5,714,017	220,714	3,063,690	126,911	3,000,800	85,459
Allegan	43,500	1,958	4,100	161	39,400	1,797		
Antrim	167,400	6,568	144,400	5,628			23,000	940
Benzie	522,600	23,470			522,600	23,470		
Berrien	644,900	21,809	18,000	581	626,900	21,228		
Charlevoix	625,700	22,850	625,700	22,850				
Delta	1,102,655	39,748	1,102,655	39,748				
Emmet	666,000	24,429	486,000	13,629	180,000	10,800		
Grand Traverse	118,000	5,670	20,000	770	98,000	4,899	3,000	100
Leelanaw	656,200	29,424	265,300	10,312	373,500	18,543	17,400	569
Mackinac	1,377,860	51,937	913,960	31,633			463,900	20,244
Manistee	166,200	7,372	41,200	1,640	123,500	5,695	1,500	37
Manitou	1,354,800	54,688	320,800	12,918			1,034,000	41,770
Mason	58,800	2,940	8,800	440	35,000	1,750	15,000	750
Menominee	1,592,450	25,030	89,450	3,981			1,503,000	21,049
Muskegon	180,200	9,757	31,900	1,575	157,300	8,182		
Oceana	81,000	3,890	5,400	270	75,600	3,620		
Ottawa	740,590	24,729	139,200	6,190	601,390	18,539		
Schoolcraft	1,647,152	75,828	1,497,152	68,328	150,000	7,500		
Van Buren	23,500	987			23,500	987		
Wisconsin	13,146,807	314,449	8,935,767	192,675	2,700,382	92,383	1,510,658	29,391
Brown	2,970,509	33,619	2,970,509	33,619				
Door	2,492,116	73,331	1,217,776	46,466	614,982	12,645	659,358	14,220
Kenosha	361,150	12,280	1,150	42	360,000	12,238		
Kewaunee	124,743	5,709	112,743	5,100	12,000	600		
Manitowoc	407,475	15,802	362,475	14,302	45,000	1,500		
Marinette	378,400	6,121	378,400	6,121				
Milwaukee	1,769,947	63,771	1,749,947	59,146	20,000	4,625		
Oconto	2,910,077	40,087	2,108,777	26,366			801,300	13,721
Ozaukee	145,300	6,305			145,300	6,305		
Racine	212,900	8,459	32,900	1,459	180,000	7,000		
Sheboygan	1,374,100	48,974	1,000	54	1,323,100	47,470	50,000	1,450

a Includes fish subsequently smoke-cured.

The total yield of the Lake Michigan fisheries amounted to 26,006,944 pounds, worth \$788,536, of which quantity the fish sold fresh represented 15,531,114 pounds, or 59.72 per cent of the total catch, those packed in ice and frozen fish aggregated 5,904,372 pounds, or 22.70 per cent, and the quantity of pickled fish was 4,571,458 pounds, or 17.58 per cent. As regards values, the

following results are obtained: the fish sold fresh were worth \$444,391, or 56.36 per cent of the total value, those packed in ice and frozen fish \$229,295, or 29.08 per cent, and pickled fish represented a value of \$114,850, or 14.56 per cent. It is seen that the fish packed in ice and frozen fish, when quantities and values are compared, showed an enhancement in value out of proportion to the quantity, while fresh fish and pickled fish had each a less proportional value than that indicated by the respective quantity. This enhanced value of fish packed in ice and frozen fish is undoubtedly due partly to the fact that most of the higher-priced kinds of fish were thus prepared, and also because they are often retained by the fishermen until the condition of the markets warrants shipment with every prospect of satisfactory remuneration.

IV.—LAKES HURON AND SAINT CLAIR FISHERIES. (a)

The fisheries of Lakes Huron and Saint Clair are carried on in 15 counties in the state of Michigan bordering upon the lakes in question. In Alcona county the apparatus used is principally gill nets and pound nets. The catch consists principally of herring, trout, whitefish, and menominee whitefish, locally called pilot fish, of which a part is sold fresh and the remainder salted in Detroit and Port Huron. The apparatus used in Alpena county consists of gill nets, pound nets, and spears. The catch includes herring, mullet, pike and pickerel, sturgeon, trout, and whitefish, and is sold fresh, salted, and frozen in the local markets and in Detroit and Buffalo. The fishermen are principally Americans and Canadians. In Arenac county fyke nets, pound nets, and spears are chiefly used in the catching of bass, catfish, herring, perch, pickerel, pike, sturgeon, suckers, trout, and whitefish. The fishermen are mostly Americans. The catch is all sold in Bay city. In Bay county fyke nets, pound nets, and spears form the chief apparatus in use. The species taken are bass, catfish, herring, mullet, perch, pickerel, pike, sturgeon, suckers, trout, and whitefish. The fish are principally sold in Cincinnati and Detroit salted and packed in ice. The fishermen are chiefly Americans. Gill nets, pound nets, and spears are employed in the fisheries of Cheboygan county. The catch is sold fresh and salted in Bay city, Chicago, Detroit, and Cleveland, and includes herring, perch, pike and pickerel, trout, and whitefish. The fishermen are mostly Americans, Canadians, and Indians. In Huron county the apparatus used consists principally of gill nets, fyke nets, pound nets, and spears. The catch, which is sold in Cincinnati, Chicago, and Saint Louis, is made up of bass, catfish, herring, trout, perch, pike and pickerel, sturgeon, suckers, whitefish, and menominee whitefish, known locally as pilot fish. Gill nets, pound nets, and spears are used in Iosco county in taking bass, catfish, herring, perch, pike and pickerel, sturgeon, suckers, trout, and whitefish. Whitefish are said to be rapidly decreasing in number, being driven away by the refuse from mills. The fishermen are all Americans. The species captured in Presque Isle county consist of herring, pickerel, trout, and whitefish. They are taken in gill nets, and are sold to a local dealer, who disposes of them in Detroit. The apparatus employed in Saint Clair county consists of gill nets, fyke nets, seines, and pound nets. The yield includes bass, catfish, herring, perch, pickerel, pike, sturgeon, suckers, trout, and whitefish. More than one-half of the entire product is frozen and shipped to Cincinnati and Chicago. The fishermen are Americans, Indians, Canadians, and a few Germans and English. In Sanilac county the output is reported to have fallen off greatly during the last ten years. The principal fish taken is herring, but perch, pickerel, sturgeon, trout, and whitefish are captured and sold in local markets. The apparatus used consists of gill nets and pound nets. The fishermen are principally Americans. In Tuscola county pound nets are relied upon to secure catfish, herring, perch, pickerel, pike, sturgeon, suckers, and whitefish. The fishermen are all Americans. In Wayne county, which borders upon Lake Saint Clair, the most important species are bass, catfish, herring, perch, pickerel, pike, sturgeon, suckers, trout, and whitefish, a part of the product being sold fresh and part salted.

a Including the Saint Clair and Detroit rivers.

CAPITAL INVESTED.

The amount of capital invested in land, buildings, and wharves, vessels, boats and apparatus, and other investments, respectively, is shown for each county in the following table:

CAPITAL INVESTED IN LAKES HURON AND SAINT CLAIR FISHERIES.

STATE AND COUNTIES.	Total.	Land, build-ings, and wharves.	Vessels.	Boats and apparatus.	Other investments.
Michigan	\$376,136	\$118,165	\$30,000	\$221,365	\$9,666
Alcona	13,305	10,125		3,180	
Alpena	49,231	24,925	3,000	29,656	650
Arenac	4,872	2,142		2,730	
Bay	88,002	36,268	1,100	59,631	3
Cheboygan	18,134	5,667		12,467	
Chippewa	20,713	1,258	1,000	18,110	345
Huron	18,067	4,401	3,500	10,165	1
Iosco	6,261	1,145		5,116	
Mackinac	40,885	4,569	2,700	33,144	472
Macomb	3,356	474		2,882	
Presque Isle	2,638			2,638	
Saint Clair	33,351	7,172	700	25,454	25
Sauflac	4,325	300		4,025	
Tuscola	3,283	500		2,783	
Wayne	69,713	19,219	18,000	39,384	2,110

Of the whole amount of capital, 31.41 per cent is invested in land, buildings, and wharves, 7.98 per cent in vessels, 59.65 per cent in boats and apparatus, and 0.96 per cent is included under other investments.

VESSELS.

There are 9 steamers and 3 schooners engaged in the fisheries of Lakes Huron and Saint Clair. 1 vessel was built in 1869, 1 in 1874, 2 in 1876, 1 in 1877, 2 in 1879, 2 in 1880, 2 in 1881, and 1 in 1889. The total present value of the vessels is \$30,000. 10 of the vessels were employed for 73 out of 120 months, and unemployed for 47 months in the aggregate. 1 vessel was engaged in fishing for 2 months and in freighting for 10 months, while 1 vessel was engaged in fishing for 6 months and in towing for 6 months. Taking all the vessels into consideration, they were employed 56.25 per cent of the time in fishing and unemployed or engaged in other business during 43.75 per cent of the time.

The following table shows the name, home port, rig, and net tonnage of the 12 vessels engaged in the fisheries of Lakes Huron and Saint Clair.

NAME, HOME PORT, RIG, AND NET TONNAGE OF VESSELS ENGAGED IN THE LAKES HURON AND SAINT CLAIR FISHERIES.

STATE AND COUNTIES.	Name of vessel.	Home port.	Rig.	Net tonnage.
Michigan				142.38
Alpena	Wayne Isbell	Port Huron, Michigan	Steamer	15.57
Bay	José Trombley	do	Schooner	11.60
Do	Morning Star	do	do	8.36
Chippewa	Mary A. Day	Marquette, Michigan	Steamer	13.04
Huron	Huron Belle	Port Huron, Michigan	do	11.75
Mackinac	Minna	Chicago, Illinois	do	17.03
Do	C. E. Kremer	Grand Haven, Michigan	do	6.36
Saint Clair	Ida May	Port Huron, Michigan	Schooner	20.71
Wayne	Sea Wing	Detroit, Michigan	Steamer	11.23
Do	Grayling	do	do	8.63
Do	Angler	do	do	9.35
Do	Fisherman	do	do	9.35

BOATS AND APPARATUS.

The respective numbers and values of sailboats, rowboats, gill nets, seines, fyke nets, pound nets, and pile drivers employed in the fisheries of Lakes Huron and Saint Clair in 1889 are shown for each county in the subjoined table:

NUMBER AND VALUE OF BOATS AND APPARATUS USED IN LAKES HURON AND SAINT CLAIR FISHERIES.

STATE AND COUNTIES.	Total value of boats and apparatus.	SAILBOATS.		OTHER BOATS.		GILL NETS.	SEINES.		FYKE NETS.		POUND NETS.		PILE DRIVERS.		OTHER APPARATUS.
		Number.	Value.	Number.	Value.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Value.
Michigan	\$224,365	255	\$25,969	368	\$7,365	\$43,116	49	\$1,601	251	\$2,987	755	\$123,818	113	\$3,783	\$12,636
Alcona	3,180	3	500	6	125	1,410					7	750	2	130	205
Alpena	29,656	13	2,125	17	340	8,633					26	8,000	6	490	1,068
Arenac	2,730	8	475	7	51				2	12	20	2,075	6	90	24
Bay	50,631	62	6,580	60	1,423				52	755	281	36,725	25	610	4,638
Cheboygan	12,467	17	1,640	23	500	2,052					46	7,745	9	208	262
Chippewa	18,110	37	3,247	27	1,212	3,143	1	51			58	9,298	12	315	844
Huron	10,165	18	1,254	32	499	2,373			67	348	49	4,930	10	182	579
Iosco	5,116	11	1,035	16	273	1,200					20	2,415	8	93	100
Mackinac	33,144	37	3,640	19	285	3,323					123	24,455	16	1,140	301
Macomb	2,882	5	220	23	238	7	4	505	23	377	5	570	3	25	910
Presque Isle	2,638	4	350	4	36	2,252									
Saint Clair	25,454	15	1,388	65	1,426	300	19	1,605	42	455	70	17,225	4	265	2,790
Sanilac	4,025	5	750	11	179	1,166					7	1,700	1	25	205
Tuscola	2,783	4	375	4	36						12	2,300	4	70	
Wayne	30,384	16	2,330	51	677	17,257	25	2,530	65	1,040	31	5,630	7	140	720

Of the total value of boats and apparatus, \$224,365, gill nets are valued at \$43,116 and pound nets at \$123,818.

PRODUCTS.

The next table gives for each county the quantities and values of each species of fish taken in 1889:

QUANTITY AND VALUE OF FISH CAUGHT IN LAKES HURON AND SAINT CLAIR.

STATE AND COUNTIES.	TOTAL.		BASS.		CATFISH.		HERRING.		PERCH.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Michigan	16,039,397	\$427,252	70,895	\$3,122	285,874	\$7,205	4,659,221	\$78,327	2,634,488	\$28,218
Alcona	102,035	4,054					6,000	139	300	9
Alpena	1,112,825	36,384					436,200	9,174		
Arenac	230,066	4,450	1,250	63	4,100	81	96,300	1,508	38,900	369
Bay	6,460,060	122,681	34,550	2,083	166,215	3,216	1,825,478	32,970	2,024,000	21,030
Cheboygan	410,530	16,819					80,100	1,987	1,550	31
Chippewa	970,335	38,627	400	29			20,800	576	3,275	150
Huron	1,045,517	24,324	9,097	273	33,714	922	368,387	6,563	204,500	2,020
Iosco	521,233	14,926	1,000	50	350	6	201,000	3,560	8,000	80
Mackinac	1,146,694	48,693	148	5			76,200	1,472	950	17
Macomb	352,589	6,069	10,750	303	12,400	375	10,854	200	126,225	1,692
Presque Isle	70,530	3,388					3,500	70		
Saint Clair	2,173,144	46,451	12,100	255	22,650	989	469,600	7,898	117,650	1,223
Sanilac	612,906	8,944					461,200	3,696	2,000	69
Tuscola	203,333	5,265			21,000	420	63,500	1,210	16,000	160
Wayne	1,521,550	46,177	1,600	70	23,045	1,196	540,102	7,394	91,138	1,467

QUANTITY AND VALUE OF FISH CAUGHT IN LAKES HURON AND SAINT CLAIR—CONTINUED.

STATE AND COUNTIES.	PIKE AND PICKEREL.		STURGEON.		SUCKERS.		TROUT.		WHITEFISH.		OTHER SPECIES.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Michigan.....	2,724,583	\$71,944	656,369	\$19,400	1,145,885	\$12,292	2,181,346	\$86,568	2,556,804	\$119,850	23,932	\$386
Alcona.....	75	10	200	6			87,700	3,525	7,760	265		
Alpena.....	16,000	560	1,000	30			513,225	19,380	146,390	7,240		
Arenac.....	48,800	1,499	3,766	89	20,000	200	8,700	311	8,250	360		
Bay.....	1,004,481	35,521	114,160	3,425	954,186	10,266	108,180	3,378	228,800	10,792		
Cheboygan.....	11,400	530					140,205	5,758	177,275	8,513		
Chippewa.....	33,400	1,071	8,600	256			262,500	9,922	622,230	26,993	19,000	269
Huron.....	196,174	6,603	20,048	621	15,700	263	121,625	4,832	76,272	2,227		
Iosco.....	16,100	499	69,533	1,566	500	5	143,550	5,783	81,200	3,977		
Mackinac.....	50	2	52,630	1,550	900	17	169,650	6,044	845,766	39,586		
Macomb.....	75,075	2,220	6,515	199	107,850	1,026			1,929	124	1,000	29
Presque Isle.....	30	2					44,800	2,234	22,200	1,082		
Saint Clair.....	999,986	15,548	272,213	8,227	3,545	19	139,550	6,110	136,450	6,182		
Sanilac.....	40,000	1,200	15,266	458			77,500	2,850	17,000	650		
Tuscola.....	73,000	2,190	2,333	70	12,500	165			21,000	1,050		
Wayne.....	210,012	4,489	90,705	2,903	30,704	331	364,031	16,381	163,681	11,969	5,832	97

The total catch was 16,939,397 pounds, valued at \$427,252. The average price per pound, considering all species, was 2.5 cents. The catch of bass amounted to 70,895 pounds, worth 4.4 cents per pound; of catfish, 285,874 pounds, valued at 2.5 cents per pound; of herring, 4,659,221 pounds, worth 1.7 cents per pound; of perch, 2,634,488 pounds, worth 1.1 cent per pound; of pike and pickerel, 2,724,583 pounds, worth 2.6 cents per pound. The quantity of sturgeon taken was 656,369 pounds, valued at 3 cents per pound. The suckers represented 1,145,885 pounds in weight, valued at 1.1 cents per pound. The yield of trout reached 2,181,346 pounds, worth 4 cents per pound. Of whitefish, 2,556,804 pounds were taken, worth 4.7 cents per pound, and the catch of all other species aggregated 23,932 pounds, valued at 1.6 cents per pound.

NATIONALITIES OF EMPLOYING FISHERMEN.

The table which follows shows the nationality of employing fishermen by counties:

NATIONALITY OF EMPLOYING FISHERMEN ENGAGED IN LAKES HURON AND SAINT CLAIR FISHERIES.

STATE AND COUNTIES.	TOTAL.			UNITED STATES.			Canada and provinces.	Norway and Sweden.	Germany.	Great Britain.	France.
	All countries.	United States.	Foreign countries.	White.	Colored.	Indian.					
Michigan.....	814	739	75	644	1	94	32	9	26	3	5
Alcona.....	10	10		10							
Alpena.....	32	25	7	25			2	5			
Arenac.....	15	14	1	14						1	
Bay.....	176	176		176							
Cheboygan.....	39	33	6	27		6	1	2	2	1	
Chippewa.....	69	63	6	23	1	39	6				
Huron.....	59	58	1	58					1		
Iosco.....	28	28		28							
Mackinac.....	45	23	22	19		4	14	2	6		
Macomb.....	24	8	16	8					10	1	5
Presque Isle.....	7	7		7							
Saint Clair.....	213	200	13	155		45	9		4		
Sanilac.....	24	24		24							
Tuscola.....	5	5		5							
Wayne.....	68	65	3	65					3		

Of the whole number of employing fishermen, 814, those of American nationality numbered 739, or 90.79 per cent, while those of foreign nationalities numbered only 75, or 9.21 per cent.

NATIONALITY OF WAGE-EARNING FISHERMEN AND SHORE HELP.

The nationality of wage-earning fishermen and shore help is shown in the same detail by counties for each nationality, as in the case of employing fishermen.

NATIONALITY OF WAGE-EARNING FISHERMEN AND SHORE HELP ENGAGED IN LAKES HURON AND SAINT CLAIR FISHERIES.

STATE AND COUNTIES.	TOTAL.			WAGE-EARNING FISHERMEN.									SHORE HELP.	Total amount earned by or paid to employes in 1889.
	All countries.	United States.	Foreign countries.	All countries.	United States.		Canada and provinces.	Norway and Sweden.	Germany.	Great Britain.	Finland.	France.		
					White.	Indian.								
Michigan.....	630	513	117	618	463	38	86	7	8	4	3	9	12	\$111,161
Alcona.....	8	8		8	8									1,830
Alpena.....	42	19	23	40	17		23						2	12,470
Arenac.....	12	11	1	12	11					1				1,480
Bay.....	155	154	1	154	153		1						1	29,908
Cheboygan.....	23	17	6	23	14	3	5	1						3,160
Chippewa.....	46	39	7	46	18	21	6	1						6,500
Huron.....	41	36	5	41	36		4			1				7,696
Iosco.....	11	11		11	11									1,965
Mackinac.....	69	48	21	68	33	14	9	5	4		3		1	18,497
Macomb.....	13	7	6	13	7		1		1	1		3		1,630
Presque Isle.....	9	9		9	9									1,575
Saint Clair.....	66	49	17	66	49		16			1				7,243
Sanilac.....	8	7	1	8	7		1							1,070
Tuscola.....	6	6		6	6									970
Wayne.....	121	92	29	113	84		20		3			6	8	15,767

Of the 630 wage-earning fishermen and shore help it is seen that 513, or 81.43 per cent, are of American nationality, while 117, or 18.57 per cent, are citizens of foreign countries. The final column in the table shows the total amount paid wage-earning fishermen and shore help during the year 1889. The full application of these figures is shown better hereinafter under the head of "Profits and earnings".

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN AND SHORE HELP.

The average monthly wages of wage-earning fishermen and shore help engaged in the fisheries of Lakes Huron and Saint Clair are shown by counties according to a classified scheme of wages in the following table :

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN AND SHORE HELP ENGAGED IN LAKES HURON AND SAINT CLAIR FISHERIES.

STATE AND COUNTIES.	Total.	Under \$20.	\$20 but under \$30.	\$30 but under \$40.	\$40 but under \$50.	\$50 but under \$60.	\$60 and over.
Total	630	60	89	194	206	77	4
FISHERMEN	618	60	88	183	206	77	4
Michigan:							
Alcona	8		1	7			
Alpena	40		2	2	13	22	1
Arenac	12		2	8		2	
Bay	154			24	129	1	
Cheboygan	23	1	3	12	7		
Chippewa	46		22	16	1	7	
Huron	41	3		9	29		
Iosco	11			9	2		
Mackinac	68		19	1	2	45	1
Macomb	13	11	2				
Presque Isle	9			9			
Saint Clair	66	7	17	29	13		
Sauilac	8	1	1	6			
Tuscola	6			2	4		
Wayne	113	37	19	49	6		2
SHORE HELP	12		1	11			
Alpena	2			2			
Bay	1			1			
Mackinac	1		1				
Wayne	8			8			

Of the whole number of such fishermen and shore help, 630, there were 60 that received under \$20 per month, 89 who received \$20 but under \$30, 194 who received \$30 but under \$40, 206 who received \$40 but under \$50, 77 who received \$50 but under \$60, and only 4 who received \$60 and over per month.

EXPENSES.

The sum of \$63,193 was expended for provisions, outfit, etc., in the census year, the details of which are shown by counties in the subjoined table:

COST OF PROVISIONS, OUTFIT, ETC., IN LAKES HURON AND SAINT CLAIR FISHERIES.

Michigan:		Michigan—Continued:	
Alcona	\$270	Macomb	\$398
Alpena	5,572	Presque Isle	1,000
Arenac	367	Saint Clair	10,739
Bay	17,498	Sauilac	535
Cheboygan	725	Tuscola	450
Chippewa	3,949	Wayne	14,145
Huron	2,252		
Iosco	990	Total	63,193
Mackinac	4,303		

PROFITS AND EARNINGS.

The profits of employing fishermen and the earnings of wage-earning fishermen and shore help are next shown by counties:

PROFITS AND EARNINGS OF PERSONS ENGAGED IN LAKES HURON AND SAINT CLAIR FISHERIES.

STATE AND COUNTIES.	EMPLOYING FISHERMEN.		WAGE-EARNING FISHERMEN AND SHORE HELP.		STATE AND COUNTIES.	EMPLOYING FISHERMEN.		WAGE-EARNING FISHERMEN AND SHORE HELP.	
	Number of owners and partners.	Profits.	Number.	Earnings.		Number of owners and partners.	Profits.	Number.	Earnings.
Michigan.....	814	\$252,958	630	\$111,161	Michigan—Cont'd.				
Alcona.....	10	1,954	8	1,820	Iosco.....	28	\$11,971	11	\$1,965
Alpena.....	32	18,342	42	12,470	Mackinac.....	45	25,893	69	18,497
Arenac.....	15	2,693	12	1,480	Macomb.....	24	4,641	13	1,030
Bay.....	176	75,275	155	29,908	Presque Isle.....	7	813	9	1,575
Cheboygan.....	39	12,994	23	3,100	Saint Clair.....	213	28,469	66	7,243
Chippewa.....	69	28,178	46	6,500	Sanilac.....	24	7,339	8	1,070
Huron.....	59	14,376	41	7,696	Tuscola.....	5	3,845	6	970
					Wayne.....	68	16,265	121	15,767

In 1889 the 814 owners and partners made on an average in the way of profits \$310.76. As this return was for 6.75 months' work, the average monthly profits for each employing fisherman amounted to \$46.04. Each of the 630 fishermen and shore help working for wages received on an average \$176.35; this being for 6.75 months' work, gives \$26.13 as the average monthly earnings of wage-earning fishermen and shore help.

FOOD-FISH PREPARATION.

The respective quantities and values of fish sold fresh, fish packed in ice and frozen fish, and pickled fish are shown by counties in the table which follows:

FOOD-FISH PREPARATION.—LAKES HURON AND SAINT CLAIR.

STATE AND COUNTIES.	TOTAL.		FISH SOLD FRESH.		FISH PACKED IN ICE AND FROZEN FISH.		PICKLED FISH.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Michigan.....	16,939,397	\$427,252	9,366,629	\$225,291	5,175,468	\$145,543	2,397,300	\$56,418
Alcona.....	102,035	4,054	74,320	118	21,715	3,797	6,000	139
Alpena.....	1,112,825	36,384	129,325	5,899	698,500	23,585	285,000	6,900
Arenac.....	291,066	4,450	117,826	2,508	16,740	442	95,500	1,500
Bay.....	6,460,650	122,681	3,754,530	58,976	1,644,720	41,840	1,060,800	21,865
Cheboygan.....	410,530	16,819	248,430	10,737	18,000	720	144,100	5,362
Chippewa.....	970,335	38,627	949,335	37,682			21,000	945
Huron.....	1,045,517	24,324	372,224	7,475	419,993	11,713	253,300	5,136
Iosco.....	521,233	14,926	196,133	6,297	123,700	5,023	201,400	3,606
Mackinac.....	1,146,694	48,693	927,994	39,923	6,000	180	212,700	8,596
Macomb.....	352,589	6,069	352,589	6,069				
Presque Isle.....	70,530	3,388	8,530	288	62,000	3,100		
Saint Clair.....	2,173,144	46,451	900,734	12,617	1,212,410	32,609	60,600	1,221
Sanilac.....	612,966	8,944	8,966	126	604,660	8,818		
Tuscola.....	299,333	5,265	151,833	4,115			57,500	1,161
Wayne.....	1,521,550	46,177	1,174,520	32,461	347,030	13,716		

The total catch was 16,939,397 pounds. Of this quantity 9,366,629 pounds, or 55.30 per cent were sold fresh. The fish packed in ice and frozen fish weighed 5,175,468 pounds, or 30.55 per cent and the weight of pickled fish amounted to 2,397,300 pounds, or 14.15 per cent of the total quantity. It is found that the fish sold fresh represent 52.73 per cent of the total value of the

catch, those packed in ice and frozen fish 34.07 per cent, and pickled fish 13.20 per cent. As in the case of Lake Michigan, it is seen that the fish packed in ice and frozen fish have a greater proportional value, while of fish sold fresh and pickled fish the proportion of value is less than the proportion of quantity.

V.—LAKE ERIE FISHERIES.

The fisheries of Lake Erie are located in 1 county in Michigan, 2 counties in New York, 8 counties in Ohio, and 1 county in Pennsylvania.

The apparatus employed in the capture of fish in Monroe county, Michigan, consists of seines, fyke nets, and pound nets. The fish taken are bass, catfish, herring, perch, pike and pickerel, suckers, sturgeon, and whitefish, which are sold partly fresh and partly salted. The fishermen are nearly all Americans. The apparatus in use in Chautauqua county, New York, is gill nets, seines, and fyke nets. The fyke nets were reported by the fishermen as trap nets. A great variety of fish is taken, including bass, catfish, chub, carp, eel pout, herring, muskellunge, perch, pike, sheepshead, sturgeon, suckers, trout, and whitefish. The fish are sold fresh or packed in ice and shipped to New York city and Buffalo. The fishermen are nearly all Americans. In Erie county, New York, gill nets, seines, and fyke nets are used. The catch is the same as that enumerated for Chautauqua county, and is sold fresh in local markets or shipped by dealers either salted or frozen. The fishermen are Americans, Hungarians, Germans, Irish, Portuguese, Norwegians, Swedes, English, and French. In Cuyahoga county, Ohio, the apparatus employed consists of gill nets and pound nets, and the fish taken are bass, catfish, herring, perch, pike and pickerel, suckers, and whitefish. Herring and whitefish are reported as decreasing rapidly. The fishermen are Americans, Norwegians, Swedes, Canadians, Germans, English, and Irish. In Erie county, Ohio, gill nets, fyke nets, and pound nets are the principal apparatus in use. Herring are reported as increasing very fast. The catch is about the same as in Cuyahoga county, with the addition of sheepshead. Americans, Germans, Canadians, and English are represented among the fishermen. The information given for Erie county is equally applicable to Lorain county, Ohio, excepting that no fyke nets are employed and that the fishermen are wholly Americans and Germans. In this county pike are reported as having fallen off about one-fifth during the past three years. In Lucas county, Ohio, the apparatus in use is seines, fyke nets, and pound nets, and the catch consists of bass, catfish, herring, perch, mullet, pike and pickerel, sturgeon, suckers, and whitefish. The fishermen are all Americans, with the exception of a few French. The apparatus employed in Ottawa county, Ohio, consists of gill nets, pound nets, fyke nets, and seines. The catch is the same as in Lucas county. The fishermen are Americans, Germans, Danes, and Canadians. In Erie county, Pennsylvania, gill nets, fyke nets, and pound nets are used, and the fish captured are bass, catfish, herring, perch, pike and pickerel, sturgeon, sheepshead, suckers, and whitefish. Nearly all the fishermen are Americans.

CAPITAL INVESTED.

As in the case of the other lakes, the amounts invested in land, buildings, and wharves, vessels, boats and apparatus, and other investments are shown by states and counties in the following table :

CAPITAL INVESTED IN LAKE ERIE FISHERIES.

STATES AND COUNTIES.	Total.	Land, buildings, and wharves.	Vessels.	Boats and apparatus.	Other investments.
Total.....	\$1,481,733	\$501,970	\$143,700	\$793,636	\$42,427
Michigan :					
Monroe.....	29,991	9,375		20,531	85
New York.....	44,387	6,005	10,200	26,717	565
Ochautauqua.....	32,206	6,875	5,500	19,276	555
Erie.....	12,181	30	4,700	7,441	10
Ohio.....	1,297,166	437,145	110,600	629,201	30,220
Ashtabula.....	12,350	4,800		7,280	270
Cuyahoga.....	172,495	104,950	29,800	34,390	3,355
Erie.....	554,705	163,025	42,500	331,765	17,415
Lake.....	71,093	28,550	13,100	28,293	1,150
Lorain.....	47,190	13,675		31,510	2,005
Lucas.....	292,025	91,045	15,000	93,185	2,795
Ottawa.....	143,498	31,100	10,200	99,028	3,170
Sandusky.....	3,810			3,750	60
Pennsylvania :					
Erie.....	200,189	48,545	22,900	117,187	11,557

Of the whole amount of capital invested in the Lake Erie fisheries, \$1,481,733, the proportion devoted to land, buildings, and wharves represented 33.88 per cent, to vessels 9.70 per cent, to boats and apparatus 53.56 per cent, while 2.86 per cent was included under other investments.

VESSELS.

There are 42 vessels, all steamers, engaged in the Lake Erie fisheries. Of these steamers 1 was built in 1867, 1 in 1868, 1 in 1871, 3 in 1878, 1 in 1880, 3 in 1881, 1 in 1882, 4 in 1883, 1 in 1884, 3 in 1885, 1 in 1886, 4 in 1887, 9 in 1888, and 9 in 1889. 5 of the vessels are owned in New York, 27 in Ohio, and 10 in Pennsylvania, there being no vessels owned in Michigan. The total value of the 42 steamers is \$143,700. The 5 owned in New York are worth \$10,200, the 27 owned in Ohio \$110,600, and the 10 owned in Pennsylvania \$22,900. The number of months fished is not given in the case of 1 vessel. Of the 41 remaining vessels, 27 were engaged in fishing for 192 months and were unemployed for 132 months; 8 were engaged in fishing for 29 months and in towing for 67 months; 2 were employed during the entire year; 1 was engaged in fishing for 6 months and was laid up for repairs the balance of the year; 1 was engaged in fishing for 1 month and carried pleasure parties during the remainder of the year, and 2 were engaged in fishing for 12 months and carried passengers for 12 months. The average time engaged in fishing was 6.4 months, or 53.66 per cent of the entire year, while during 5.6 months, or 46.34 per cent of the year, the vessels were either unemployed or engaged in some other business.

The following table shows, by states and counties, the names, home ports, rig, and net tonnage of the 42 vessels:

NAME, HOME PORT, RIG, AND NET TONNAGE OF VESSELS ENGAGED IN LAKE ERIE FISHERIES.

STATES AND COUNTIES.	Name of vessel.	Home port.	Rig.	Net tonnage.
Total.....				623.04
New York.....				68.36
Chautauqua.....	H. G. Brooks.....	Dunkirk, New York.....	Steamer.....	6.71
Do.....	Neal H. Dow.....	do.....	do.....	5.40
Erie.....	Lorain.....	Buffalo, New York.....	do.....	23.75
Do.....	Jennie A. Desmond.....	do.....	do.....	21.54
Do.....	John R. Williams.....	do.....	do.....	11.96
Ohio.....				439.70
Cuyahoga.....	Helene.....	Cleveland, Ohio.....	Steamer.....	8.48
Do.....	Tempest.....	Port Huron, Michigan.....	do.....	7.61
Do.....	Hattie L.....	Cleveland, Ohio.....	do.....	8.46
Do.....	Thomas Monson.....	do.....	do.....	10.23
Do.....	Markwell.....	do.....	do.....	5.61
Do.....	Enterprise.....	do.....	do.....	7.02
Do.....	C. R. Edson.....	do.....	do.....	14.99
Do.....	Mascotte.....	do.....	do.....	5.40
Do.....	I. X. L.....	do.....	do.....	10.11
Erie.....	J. L. Wyland.....	Sandusky, Ohio.....	do.....	6.76
Do.....	Walter H. Stone.....	do.....	do.....	17.79
Do.....	Lonise.....	do.....	do.....	43.66
Do.....	Erie.....	do.....	do.....	10.42
Do.....	Erwin.....	do.....	do.....	8.48
Do.....	Annie Robertson.....	do.....	do.....	9.42
Do.....	Edward Fiske.....	do.....	do.....	21.93
Do.....	H. A. Ballantyn.....	do.....	do.....	61.25
Lake.....	Jesse Enos.....	Cleveland, Ohio.....	do.....	6.71
Do.....	Fishing Queen.....	do.....	do.....	7.91
Do.....	Modoc.....	do.....	do.....	12.54
Do.....	Ada.....	Buffalo, New York.....	do.....	15.78
Do.....	Star.....	Cleveland, Ohio.....	do.....	6.26
Lucas.....	Douglas.....	Toledo, Ohio.....	do.....	67.63
Do.....	L. Birkhead.....	Detroit, Michigan.....	do.....	16.50
Ottawa.....	Aaron Wilcox.....	Sandusky, Ohio.....	do.....	7.15
Do.....	Samuel J. Christian.....	do.....	do.....	32.25
Do.....	Una.....	do.....	do.....	9.00
Pennsylvania.....				114.98
Erie.....	Loretta Englesbe.....	Erie, Pennsylvania.....	Steamer.....	51.94
Do.....	W. J. McCarter.....	do.....	do.....	6.70
Do.....	L. D. Davis.....	do.....	do.....	7.29
Do.....	John R. Cooney.....	do.....	do.....	6.70
Do.....	Fred. B. Hall.....	do.....	do.....	7.42
Do.....	John L. Hyner.....	do.....	do.....	6.91
Do.....	Edith.....	Milwaukee, Wisconsin.....	do.....	7.73
Do.....	Jean.....	Erie, Pennsylvania.....	do.....	6.48
Do.....	F. P. Eschbacher.....	do.....	do.....	7.11
Do.....	Fred. King.....	do.....	do.....	6.70

The total net tonnage for the lake is 623.04. Of this aggregate New York should be credited with 68.36, Ohio with 439.70, and Pennsylvania with 114.98. The City of Dresden, a Canadian steamer owned by an American fisherman, was engaged in 1889 in the taking and transporting of fish in American waters.

BOATS AND APPARATUS.

The various kinds of boats and apparatus are shown in detail for states and counties in the subjoined table:

NUMBER AND VALUE OF BOATS AND APPARATUS USED IN LAKE ERIE FISHERIES.

STATES AND COUNTIES.	Total value of boats and apparatus.	SAILBOATS.		OTHER BOATS.		GILL NETS.	SEINES.		FYKE NETS.		POUND NETS.		PILE DRIVERS.		OTHER APPARATUS.
		Number.	Value.	Number.	Value.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Value.
Total	\$793,636	411	\$61,207	652	\$66,349	\$94,978	34	\$2,150	930	\$30,680	1,838	\$483,920	120	\$46,050	\$8,302
Michigan :															
Monroe	20,531	8	570	24	881		6	650	39	616	101	17,100	5	390	324
New York	26,717	24	2,995	100	4,476	16,445	14	690	51	999					1,112
Chautauqua	19,276	21	2,815	37	3,082	11,525	10	435	20	500					919
Erie	7,441	3	180	63	1,394	4,920	4	255	31	499					193
Ohio	629,201	326	49,687	287	37,607	31,688	14	810	750	25,485	1,668	441,120	110	30,365	3,379
Ashtabula	7,280	7	450	14	2,181	2,011	3	75	17	350	5	2,000			213
Cuyahoga	34,390	13	1,675	6	895	11,140					73	18,200	6	1,980	509
Erie	341,765	120	23,875	115	16,130	6,935			284	12,475	654	246,480	56	23,950	1,920
Lake	28,293	13	2,475	23	3,680	5,022	1	20	4	120	54	15,900	2	900	176
Lorain	31,510	20	3,925	20	1,870	800					108	19,750	9	5,015	150
Lucas	93,185	70	6,850	47	5,405		6	315	30	625	511	75,640	17	4,350	
Ottawa	99,028	76	9,687	62	7,506	5,780	4	400	290	8,915	263	63,150	20	3,170	420
Sandusky	3,750	7	750						125	3,000					
Pennsylvania :															
Erie	117,187	53	7,955	241	23,325	46,845			90	3,580	69	25,700	6	6,295	3,487

^a Reported by the fishermen as traps.

The total value of boats and apparatus is \$793,636. Of this amount \$483,920 is invested in pound nets, thus showing the marked prominence which this form of apparatus has acquired on this lake.

PRODUCTS.

The quantity, in pounds, and the value of bass, catfish, herring, perch, pike and pickerel, sturgeon, suckers, trout, whitefish, and other species taken in Lake Erie in 1889 are shown in detail by states and counties in the following table:

QUANTITY AND VALUE OF FISH CAUGHT IN LAKE ERIE.

STATES AND COUNTIES.	TOTAL.		BASS.		CATFISH.		HERRING.		TROUT.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	63,563,322	\$1,033,758	854,957	\$34,953	1,251,990	\$41,973	37,200,850	\$295,171	3,890,000	\$45,283
Michigan :										
Monroe	910,215	14,764	1,610	35	168,970	4,204	454,617	3,530	90,500	1,161
New York	2,711,276	79,685	38,968	2,682	88,455	3,940	1,408,215	19,123	70,171	1,857
Chautauqua	2,284,221	63,892	33,625	2,203	66,317	2,870	1,272,067	17,095	62,423	1,642
Erie	427,055	15,793	5,343	389	22,138	1,061	136,148	2,028	7,748	215
Ohio	47,449,481	683,590	756,212	29,249	940,505	30,962	28,731,869	297,833	3,204,472	33,684
Ashtabula	475,494	8,803	625	35	20,367	1,018	184,167	1,813	8,250	165
Cuyahoga	6,429,418	92,226	25,129	1,064	17,520	1,141	3,694,334	43,667	525,292	7,523
Erie	22,822,913	331,462	591,985	24,951	316,128	11,297	15,747,335	160,044	921,043	10,296
Lake	2,636,551	42,492	17,342	886	47,450	2,543	1,346,073	13,844	380,631	6,258
Lorain	3,161,633	44,550	12,000	300	22,639	1,441	2,253,323	22,533	91,042	1,005
Lucas	5,641,372	79,073	17,000	420	330,653	6,999	2,654,321	26,776	622,184	4,207
Ottawa	5,846,070	80,115	82,121	1,233	196,138	6,087	2,707,246	27,436	607,230	3,948
Sandusky	376,000	4,879	10,000	200	16,200	426	145,000	1,450	48,000	280
Pennsylvania :										
Erie	12,492,360	255,719	58,167	2,987	54,060	2,767	6,606,149	74,685	458,896	8,741

STATES AND COUNTIES.	PIKE AND PICKEREL.		STURGEON.		SUCKERS.		TROUT.		WHITEFISH.		OTHER SPECIES.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	14,583,471	\$284,201	1,244,607	\$47,045	1,072,495	\$10,609	66,702	\$3,714	3,223,772	\$167,172	134,446	\$8,537
Michigan :												
Monroe	54,745	2,392	1,610	76	33,400	280			50,363	2,600	48,400	446
New York	427,627	18,208	155,800	7,066	55,500	1,180	66,703	3,714	370,887	19,378	28,050	2,537
Chautauqua	354,847	15,310	56,387	2,438	28,965	830	66,649	3,710	342,331	17,665	600	30
Erie	72,780	2,898	99,413	4,628	26,535	350	54	4	28,556	1,713	28,350	2,507
Ohio	10,694,147	175,482	410,486	14,741	912,096	8,104			1,742,596	92,981	57,098	554
Ashtabula	120,114	2,091	19,771	942	84,233	843			37,867	1,893		
Cuyahoga	1,987,249	28,631	31,260	2,063	26,666	200			121,958	7,667		
Erie	4,052,447	71,253	92,312	3,781	179,799	1,764			969,265	47,878	18,508	186
Lake	656,454	11,124	89,366	2,952	87,267	1,081			71,968	3,804		
Lorain	637,833	10,881	37,220	2,247	4,750	35			162,806	6,108		
Lucas	1,349,063	23,843	93,900	1,778	305,015	2,096			251,095	12,589	38,000	265
Ottawa	1,784,687	25,968	46,647	978	174,305	1,585			247,196	12,717	500	3
Sandusky	106,300	1,688			50,000	500			6,500	325		
Pennsylvania :												
Erie	3,406,952	88,119	676,711	25,162	71,499	1,045			1,159,926	52,213		

The total catch amounted to 63,563,332 pounds, valued at \$1,033,758, or an average value of 1.6 cents per pound. The aggregates of the table may be briefly summarized as follows: Bass, 854,957 pounds, worth 4.1 cents per pound; catfish, 1,251,990 pounds, valued at 3.4 cents per pound; herring, 37,200,850 pounds, averaging 1.1 cents per pound; perch, 3,830,039 pounds, worth 1.2 cents per pound; pike and pickerel, 14,583,471 pounds, with an average value of 1.9 cents per pound; sturgeon, 1,244,607 pounds, worth 3.8 cents per pound; suckers, 1,072,495 pounds, valued at 1 cent per pound; trout, 66,703 pounds, valued at 5.6 cents per pound; whitefish, 3,323,772 pounds, worth 5 cents per pound, and 134,448 pounds of other species, worth 2.6 cents per pound.

NATIONALITY OF EMPLOYING FISHERMEN.

The number of employing fishermen for each state and county and the respective number of each nationality is next presented. As in the case of the other lakes, those of American nationality are also specified as being white, colored, or Indian.

NATIONALITY OF EMPLOYING FISHERMEN ENGAGED IN LAKE ERIE FISHERIES.

STATES AND COUNTIES.	TOTAL.			UNITED STATES.			Canada and provinces.	Norway and Sweden.	Germany.	Great Britain.	Portugal.	France.	Ireland.	Spain.	Hungary.	Greece.	Denmark.
	All countries.	United States.	Foreign countries.	White.	Colored.	Indian.											
Total	631	589	42	585	2	2	3	5	15	7	4	1	3	1	1	1	1
Michigan:																	
Monroe	33	28	5	28					1	4							
New York	160	141	19	139		2		2	4	3	4	1	3	1	1		
Chautauqua	61	58	3	56		2			1	1				1			
Erie	99	83	16	83				2	3	2	4	1	3		1		
Ohio	370	357	13	355	2		2	3	7								1
Ashtabula	18	17	1	17				1									
Cuyahoga	22	20	2	20				2									
Erie	80	75	5	75			1		4								
Lake	28	28		27	1												
Lorain	24	23	1	23					1								
Lucas	64	64		64													
Ottawa	124	121	3	121					2								1
Sandusky	10	9	1	8	1		1										
Pennsylvania:																	
Erie	68	63	5	63			1		3								1

The number of employing fishermen engaged in the Lake Erie fisheries is 631. Of these 589, or 93.34 per cent, are of American nationality, while 42, or 6.66 per cent, are of foreign nationalities.

NATIONALITY OF WAGE-EARNING FISHERMEN AND SHORE HELP.

With a specification by states and counties, as in the case of employing fishermen, the nationalities of the wage-earning fishermen and shore help engaged in the Lake Erie fisheries are shown in the next table.

NATIONALITY OF WAGE-EARNING FISHERMEN AND SHORE HELP ENGAGED IN LAKE ERIE FISHERIES.

STATES AND COUNTIES.	TOTAL.			WAGE-EARNING FISHERMEN.					
	All countries.	United States.	Foreign countries.	All countries.	United States.		Canada and provinces.	Norway and Sweden.	Germany.
					White.	Colored.			
Total	1,550	1,480	70	1,334	1,267	3	6	5	55
Michigan :									
Monroe	31	31		30	30				
New York	76	75	1	68	67		1		
Chautauqua	65	64	1	57	56		1		
Erie	11	11		11	11				
Ohio	1,207	1,145	62	1,027	969	2	5	5	39
Ashtabula	12	12		12	12				
Cuyahoga	148	127	21	123	108		1	5	2
Erie	563	554	9	452	443		1		6
Lake	69	66	3	55	52		1		1
Lorain	69	54	6	60	54				6
Lucas	195	190	5	170	165				
Ottawa	154	136	18	149	131		2		15
Sandusky	6	6		6	4	2			
Pennsylvania :									
Erie	246	229	7	269	261	1			5

STATES AND COUNTIES.	WAGE-EARNING FISHERMEN—continued.						SHORE HELP.			Total amount carried by or paid to employes in 1889.
	Great Britain.	Portugal.	France.	Ireland.	Denmark.	Switzerland.	All countries.	United States.	Foreign countries.	
Total	4	1	5	6	1	1	216	210	6	\$461,594
Michigan :										
Monroe							1	1		3,240
New York							8	8		21,301
Chautauqua							8	8		19,630
Erie										1,671
Ohio	4		5	6	1		189	174	6	323,549
Ashtabula										3,122
Cuyahoga	1			6			25	19	6	55,389
Erie	2						111	111		137,646
Lake	1						14	14		31,166
Lorain										19,565
Lucas			5				25	25		38,442
Ottawa					1		5	5		37,007
Sandusky										1,210
Pennsylvania :										
Erie		1				1	27	27		113,453

Of the whole number of wage-earning fishermen and shore help, 1,550, those of American nationality number 1,480, or 95.48 per cent, and those of foreign nationalities amount to 70, or 4.52 per cent. The total amount paid to wage-earning fishermen and shore help during the census year was \$461,534. The average amount earned by each fisherman and shore help during the period specified is shown hereinafter under the heading "Profits and earnings".

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN AND SHORE HELP.

The average monthly wages of wage-earning fishermen and shore help are shown by states and counties, in accordance with a scheme of classified monthly wages, in the following table:

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN AND SHORE HELP ENGAGED IN LAKE ERIE FISHERIES.

STATES AND COUNTIES.	Total.	Under \$20.	\$20 but under \$30.	\$30 but under \$40.	\$40 but under \$50.	\$50 but under \$60.	\$60 and over.	STATES AND COUNTIES.	Total.	Under \$20.	\$20 but under \$30.	\$30 but under \$40.	\$40 but under \$50.	\$50 but under \$60.	\$60 and over.
Total	1,550	10	36	49	397	506	552	Pennsylvania :							
FISHERMEN.								Erie	209	4	2	2	6	2	193
Michigan :								SHORE HELP.							
Monroe	30		3	26	1			Michigan :							
New York	68	1	13	6	4	24	20	Monroe	1		1				
Chautauqua	57	1	12	2	4	18	20	New York :							
Erie	11		1	4		6		Chautauqua	8	1	1		6		
Ohio	1,027	1	13	15	346	381	271	Ohio	180	3			31	99	44
Ashtabula	12	1	1			5	5	Cuyahoga	25				25		
Cuyahoga	123				14	40	69	Erie	111	3			4	74	30
Erie	452		1		111	215	125	Lake	14						14
Lake	55				3	1	51	Lucas	25				5	20	
Lorain	60				18	35	7	Ottawa	5					5	
Lucas	170		4	13	153			Pennsylvania :							
Ottawa	149		5	2	43	85	14	Erie	27		3				24
Sandusky	6		2		4										

Of the whole number of persons considered, 1,550, there were 10 receiving under \$20 per month, 36 receiving \$20 but under \$30 per month, 49 making \$30 but under \$40 per month, 397 averaging \$40 and over but under \$50, 506 receiving \$50 but under \$60, and 552 obtaining \$60 and over per month. It is seen that 1,058, or more than two-thirds, received in excess of \$50 per month.

FOOD-FISH PREPARATION.

The quantities and values of fish sold fresh, fish packed in ice and frozen fish, and pickled fish are shown by states and counties in the following tabular presentation:

FOOD-FISH PREPARATION.—LAKE ERIE.

STATES AND COUNTIES.	TOTAL.		FISH SOLD FRESH.		FISH PACKED IN ICE AND FROZEN FISH.		PICKLED FISH.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total.....	63,563,332	\$1,033,758	21,810,258	\$300,797	30,847,700	\$529,544	10,905,374	\$203,417
Michigan:								
Monroe.....	910,215	14,764	884,215	13,904	26,000	860		
New York.....	2,711,276	79,685	1,516,483	39,754	744,137	27,993	451,656	11,938
Chautauqua.....	2,284,221	63,892	1,088,428	23,961	744,137	27,993	451,656	11,938
Erie.....	427,055	15,793	427,055	15,793				
Ohio.....	47,449,481	683,599	15,287,905	187,392	24,147,933	358,470	8,013,643	137,758
Ashtabula.....	475,494	8,803	148,828	2,183	297,332	6,008	29,334	612
Cuyahoga.....	6,429,418	92,226	2,151,844	20,201	2,690,578	43,495	1,577,906	28,530
Erie.....	22,822,943	331,452	5,758,693	63,970	12,380,070	183,940	4,684,180	83,542
Lake.....	2,696,551	42,492	394,636	5,617	1,805,663	29,156	525,952	7,719
Lorain.....	3,161,633	44,559	291,218	3,150	2,149,074	27,700	829,341	13,700
Lucas.....	5,641,372	79,073	1,749,310	24,172	3,681,964	53,409	219,098	1,452
Ottawa.....	5,846,070	89,115	4,397,076	63,190	1,083,252	14,762	165,742	2,163
Sandusky.....	376,000	4,879	376,000	4,879				
Pennsylvania:								
Erie.....	12,492,300	255,719	4,122,655	59,777	5,929,630	142,221	2,440,075	53,721

The total catch amounted to 63,563,332 pounds, valued at \$1,033,758. Examination of the table shows that 21,810,258 pounds, or 34.31 per cent of the entire catch, were sold fresh. The fish packed in ice and frozen fish weighed 30,847,700 pounds, being 48.53 per cent, while the pickled fish represented 10,905,374 pounds, or 17.16 per cent. Next comparing values, it is seen that the fish sold fresh represented 29.10 per cent of the total value, those packed in ice and frozen fish 51.22 per cent, and the pickled or salted fish 19.68 per cent. It will be noticed by a comparison of these percentages that the fish packed in ice and frozen fish and the pickled fish both showed an enhancement in value when compared with the percentages of quantity, while on the other hand the fish sold fresh had a less percentage of the total value than they had of the total quantity. This may be partially accounted for if the kinds of fish that were iced, frozen, or pickled were of proportionally greater value originally than the kinds sold fresh. The comparatively large proportion that was iced or frozen shows the recognized value of ice and refrigeration as methods of food preservation, and their economic value is equally pronounced, for they place in the hands of consumers at a reasonable price a food product that might otherwise be unavailable at a long distance from the fishing grounds.

VI.—LAKE ONTARIO FISHERIES.

The fisheries of Lake Ontario are carried on in 7 counties located in the state of New York. No registered vessels were reported as being engaged in fishing on Lake Ontario in the census year 1889. From 1886 to 1889 the legislature of the state of New York passed many laws, the avowed purpose of which was to stop all commercial fishing in certain counties bordering upon Lake Ontario excepting that fishing done with hook and line held in the hand or attached to a fishing rod. As is shown elsewhere in this bulletin, the decline in the fisheries of this lake has been marked, and is no doubt largely attributable to the legislation referred to.

CAPITAL INVESTED.

The total capital invested in the fisheries of Lake Ontario is \$47,716. The various amounts included under the classified headings of "Land, buildings, and wharves", "Boats and apparatus", and "Other investments" are shown by counties in the subjoined table:

CAPITAL INVESTED IN LAKE ONTARIO FISHERIES.

STATE AND COUNTIES.	Total.	Land, build- ings, and wharves.	Boats and apparatus.	Other invest- ments.
New York.....	\$47,716	\$2,914	\$42,916	\$1,886
Cayuga.....	1,265	125	1,140	
Jefferson.....	20,571	1,189	17,703	1,679
Monroe.....	6,049	350	5,699	
Niagara.....	6,218	290	5,868	60
Orleans.....	1,608	100	1,608	
Oswego.....	10,632	525	9,360	147
Wayne.....	1,873	335	1,538	

Considering the aggregates for the lake, it is found that 6.11 per cent of the total capital invested is in the form of land, buildings, and wharves. Boats and apparatus represent 89.94 per cent, while 3.95 per cent is devoted to other investments.

BOATS AND APPARATUS.

Of a total investment of \$42,916 in boats and apparatus, the former represent \$13,232, gill nets, fyke nets, and seines \$19,809, pound nets and trap nets \$8,225, and other apparatus \$1,650. The details by counties are given in the following table:

BOATS AND APPARATUS USED IN LAKE ONTARIO FISHERIES.

STATE AND COUNTIES.	Total value of boats and appa- ratus.	SAILBOATS.		OTHER BOATS.		GILL NETS. Value.	SEINES.		FYKE NETS.		POUND NETS AND TRAP NETS.		OTHER AP- PARATUS. Value.
		Num- ber.	Value.	Num- ber.	Value.		Num- ber.	Value.	Num- ber.	Value.	Num- ber.	Value.	
New York.....	\$42,916	128	\$8,572	125	\$4,660	\$13,337	9	\$665	558	\$5,807	172	\$8,225	\$1,650
Cayuga.....	1,140	1	540	3	70	395			9	130			5
Jefferson.....	17,703	54	2,665	42	699	3,514	2	35	363	4,141	164	6,575	74
Monroe.....	5,699	10	485	18	2,183	2,205	2	130	83	456			241
Niagara.....	5,868	19	785	20	498	2,056					8	1,650	879
Orleans.....	1,608	11	472	2	25	1,055							56
Oswego.....	9,360	30	3,225	33	947	3,220	5	500	101	1,675			393
Wayne.....	1,538	3	400	7	238	892			2	6			2

PRODUCTS.

The next table shows by counties the principal kinds of fish caught, the quantity (in pounds), and the value:

QUANTITY AND VALUE OF FISH CAUGHT IN LAKE ONTARIO.

STATE AND COUNTIES.	TOTAL.		BASS.		CATFISH.		HERRING. (a)		PERCH.		PIKE AND PICKEREL.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
New York.....	2,691,946	\$85,431	44,994	\$1,683	167,066	\$7,413	1,850,140	\$18,202	85,496	\$1,621	184,254	\$10,959
Cayuga.....	11,513	763	1,866	118	2,713	173	400	20	300	18	3,821	231
Jefferson.....	612,319	24,834	26,968	584	120,836	4,777	66,705	2,495	46,086	487	143,345	9,059
Monroe.....	311,068	12,349	8,490	446	8,200	667	269,203	9,853	8,500	553	3,965	223
Niagara.....	1,173,439	27,329	2,910	248			1,076,500	22,389	29,710	512	760	27
Orleans.....	66,500	2,506					31,700	898				
Oswego.....	432,996	14,496	3,350	167	33,957	1,681	324,632	9,663	750	46	32,363	1,419
Wayne.....	84,120	3,144	1,500	120	1,300	115	81,060	2,884	150	5		

STATE AND COUNTIES.	STURGEON.		SUCKERS.		TROUT.		WHITEFISH.		OTHER SPECIES.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
New York.....	200,927	\$10,925	74,344	\$890	6,500	\$511	23,383	\$1,470	54,902	\$1,751
Cayuga.....	2,000	180			100	5	63	5	250	10
Jefferson.....	74,976	3,750	61,794	685	4,700	336	17,000	1,085	49,909	1,555
Monroe.....	10,000	500	1,500	45			300	36	1,000	20
Niagara.....	61,200	3,934	100	4	1,700	170	550	55		
Orleans.....	34,400	1,574					200	20	200	14
Oswego.....	18,351	957	10,950	156			5,100	255	3,543	162
Wayne.....							170	20		

a Includes the minor species of whitefish.

The total catch amounts to 2,691,946 pounds, worth \$85,431, which gives an average value of 3.2 cents per pound. In 1889 bass were valued at 3.7 cents per pound, catfish at 4.4 cents, herring at 2.6 cents, perch at 1.9 cents, pike and pickerel at 5.9 cents, sturgeon at 5.4 cents, suckers at 1.2 cents, trout at 7.9 cents, whitefish at 6.3 cents, and other species at 3.2 cents.

NATIONALITY OF EMPLOYING FISHERMEN.

The nationality of employing fishermen in detail, by counties, is next shown.

NATIONALITY OF EMPLOYING FISHERMEN ENGAGED IN LAKE ONTARIO FISHERIES.

STATE AND COUNTIES.	TOTAL.			United States.	Canada and provinces.	Great Britain.
	All countries.	United States.	Foreign countries.			
New York.....	287	282	5	282	3	2
Cayuga.....	6	4	2	4		2
Jefferson.....	103	101	2	101	2	
Monroe.....	21	21		21		
Niagara.....	43	43		43		
Orleans.....	18	18		18		
Oswego.....	82	81	1	81	1	
Wayne.....	14	14		14		

Of the whole number of employing fishermen, 287, there were 282, or 98.26 per cent, of American nationality, and 5, or 1.74 per cent, were citizens of Canada or Great Britain. All those of American nationality were white.

NATIONALITY OF WAGE-EARNING FISHERMEN AND SHORE HELP.

There were only 111 wage-earning fishermen and shore help engaged in the industry on Lake Ontario, and their annual wages amounted to only \$12,068. Of the whole number, 109, or 98.20 per cent, were of American nationality, while 2, or 1.80 per cent, were citizens of Canada. The details by counties are given in the following table :

NATIONALITY OF WAGE-EARNING FISHERMEN AND SHORE HELP IN LAKE ONTARIO FISHERIES.

STATE AND COUNTIES.	TOTAL.			WAGE-EARNING FISHERMEN.				SHORE HELP.	Total amount earned by or paid to employees in 1899.
	All countries.	United States.	Foreign countries.	All countries.	United States.		Canada and provinces.	United States.	
					White.	Colored.			
New York.....	111	109	2	103	97	4	2	8	\$12,068
Cayuga.....	1	1		1	1				40
Jefferson.....	44	44		41	41			3	3,519
Monroe.....	21	21		21	17	4			3,799
Niagara.....	14	13	1	13	12		1	1	1,750
Orleans.....	1	1		1	1				50
Oswego.....	25	24	1	21	20		1	4	2,467
Wayne.....	5	5		5	5				257

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN AND SHORE HELP.

Of the 111 wage-earning fishermen and shore help, 103 were engaged in the industry upon the lake, while 8 were shore help. Considering both branches combined, we find that 10 fishermen and shore help received under \$20 per month and only one \$60 or over. Of the remaining 100, 50 obtained \$20 but under \$30, while the other 50 ranged from \$30 to \$60. The previously mentioned facts, with further detail as regards counties, are shown in the subjoined table:

AVERAGE MONTHLY WAGES OF WAGE-EARNING FISHERMEN AND SHORE HELP ENGAGED IN LAKE ONTARIO FISHERIES.

STATE AND COUNTIES.	Total.	Under \$20.	\$20 but under \$30.	\$30 but under \$40.	\$40 but under \$50.	\$50 but under \$60.	\$60 and over.
Total.....	111	10	50	21	17	12	1
FISHERMEN.....	103	7	47	21	16	11	1
New York:							
Cayuga.....	1		1				
Jefferson.....	41	2	26	7	1	5	
Monroe.....	21		5	2	7	6	1
Niagara.....	13	2	3	2	6		
Orleans.....	1	1					
Oswego.....	21		11	8	2		
Wayne.....	5	2	1	2			
SHORE HELP.....	8	3	3		1	1	
Jefferson.....	3		2		1		
Niagara.....	1		1				
Oswego.....	4	3				1	

EXPENSES.

To carry on the business the employing fishermen expended \$3,078 for provisions, fuel, outfit, etc., during the census year. The expenses by counties are given below :

COST OF PROVISIONS, OUTFIT, ETC., IN LAKE ONTARIO FISHERIES.

New York :	
Cayuga.....	\$99
Jefferson.....	1,357
Monroe.....	332
Niagara.....	675
Orleans.....	20
Oswego.....	540
Wayne.....	55
Total.....	3,078

PROFITS AND EARNINGS.

The 287 owners and partners comprehended by the designation "employing fishermen" had aggregate profits amounting to \$70,285, or an average of \$244.90. The average annual earnings of the 111 wage-earning fishermen and shore help were \$108.72. As no statistics were obtained of the time engaged in fishing, it is impossible to arrive at monthly averages, as in the case of the other lakes. The county details are given in the next table, an examination of which shows that fishing was most profitable to employing fishermen in Niagara county, where the annual average for each reached \$579.86.

PROFITS AND EARNINGS OF PERSONS ENGAGED IN LAKE ONTARIO FISHERIES.

STATE AND COUNTIES.	EMPLOYING FISHERMEN.		WAGE-EARNING FISHERMEN AND SHORE HELP.	
	Number of owners and partners.	Profits.	Number.	Earnings.
New York.....	287	\$70,285	111	\$12,068
Cayuga.....	6	624	1	40
Jefferson.....	103	19,958	44	3,519
Monroe.....	21	8,218	21	3,799
Niagara.....	43	24,934	14	1,730
Orleans.....	18	2,430	1	56
Oswego.....	82	11,289	25	2,667
Wayne.....	14	2,832	5	257

FOOD-FISH PREPARATION.

The quantity and value, respectively, of fish sold fresh, fish packed in ice and frozen fish and pickled fish are shown in detail by counties in the following table:

FOOD-FISH PREPARATION.—LAKE ONTARIO.

STATE AND COUNTIES.	TOTAL.		FISH SOLD FRESH.		FISH PACKED IN ICE AND FROZEN FISH.		PICKLED FISH.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
New York.....	2,691,946	\$85,431	2,189,501	\$67,515	347,400	\$12,638	155,045	\$5,278
Cayuga.....	11,513	763	1,268	100	10,245	663		
Jefferson.....	612,319	24,834	555,178	22,496	11,466	682	45,675	1,686
Monroe.....	311,068	12,349	301,065	11,849			10,000	500
Niagara.....	1,173,439	27,339	923,430	29,490	190,300	5,194	59,700	1,685
Orleans.....	66,500	2,500	24,600	628	18,200	1,200	23,700	678
Oswego.....	432,906	14,496	349,037	10,828	78,189	3,449	5,770	219
Wayne.....	84,129	3,144	34,920	1,184	33,000	1,450	10,200	510

The total catch amounted to 2,691,946 pounds, of which 81.34 per cent was sold fresh, 12.90 per cent packed in ice or frozen, and 5.76 per cent pickled. It is found that the fish sold fresh represented 79.03 per cent of the total value, \$85,431, while those packed in ice and frozen fish represented 14.79 per cent and pickled fish 6.18 per cent. As in the case of the other lakes, the fish packed in ice or frozen show a proportional enhancement in value, while the proportional values of fish sold fresh or pickled were less than their proportional quantities.

VII.—MARKETS.

The total value of the catch in all the Great Lakes is \$2,615,784. This product has to find a market, and the following table shows the cities and towns in which the fish were sold by the fishermen who lifted them from the water, the states and counties in which the specified cities and towns are located, the lakes from which the fish sold in the specified cities and towns were taken, and the value of the fish sold in the towns and cities specified. The arrangement of the cities and towns is alphabetical, and where more than one locality is mentioned on the same line in the "cities and towns" column the order of the states and counties in their respective columns conforms to the order of the cities and towns in the column devoted to them:

MARKETS FOR PRODUCTS OF THE GREAT LAKES FISHERIES.

CITIES AND TOWNS.	States.	Counties.	Value.	Lakes from which taken.
Total.....			\$2,615,784	
Ahnapee	Wisconsin	Kewaunee	4,770	Michigan.
Alcona	Michigan	Alcona	484	Huron and Saint Clair.
Algonac	do	Saint Clair	4,622	Do.
Allenville	do	MacKinnac	150	Michigan.
Alpena	do	Alpena	14,764	Huron and Saint Clair.
Amboy	Ohio	Ashtabula	264	Erie.
Arenac	Michigan	Bay	45	Huron and Saint Clair.
Ashland	Wisconsin	Ashland	1,217	Superior.
Ashland and Bayfield	do	Ashland and Bayfield	159	Do.
Attica, Johnstown, and New York	New York	Wyoming, Fulton, and New York	1,680	Ontario.
Auburn and New York	do	Cayuga and New York	109	Do.
Ausable	Michigan	Iosco	3,724	Huron and Saint Clair.
Ausable and Bay city	do	Iosco and Bay	1,680	Do.
Ausable and Iosco	do	Iosco and Livingston	45	Do.
Au Train	do	Alger	641	Superior.
Avon Lake and Lorain	Ohio	Lorain	1,200	Erie.
Baltimore	Maryland	Baltimore	2,000	Do.
Baltimore, New York, and Philadelphia	Maryland, New York, and Pennsylvania.	Baltimore, New York, and Philadelphia.	39,475	Do.
Baltimore, New York, and Washington	Maryland, New York, and District of Columbia.	Baltimore, New York, and District of Columbia.	2,500	Do.
Banks	Michigan	Bay	2,795	Huron and Saint Clair.
Baraga and L'Anse	do	Baraga	100	Superior.
Batavia and New York	New York	Genesee and New York	517	Ontario.
Bay city	Michigan	Bay	84,774	Huron and Saint Clair.
Bay city and Chicago	Michigan and Illinois.	Bay and Cook	990	Michigan.
Bay city, Chicago, and Detroit	do	Bay, Cook, and Wayne	23,220	Superior, Huron, and Saint Clair.
Bay city and Detroit	Michigan	Bay and Wayne	2,321	Huron and Saint Clair.
Bay city, Detroit, and Grand Rapids	do	Bay, Wayne, and Kent	1,120	Do.
Bay city and New York	Michigan and New York	Bay and New York	1,140	Do.
Bayfield	Wisconsin	Bayfield	38,580	Superior.
Bayfield and Chicago	Wisconsin and Illinois.	Bayfield and Cook	14,710	Do.
Bayfield and Duluth	Wisconsin and Minnesota	Bayfield and Saint Louis	4,573	Do.
Bayfield, Minneapolis, and Saint Paul	do	Bayfield, Hennepin, and Ramsey	306	Do.
Bayfield and Washburn	Wisconsin	Bayfield	274	Do.
Bay Mills	Michigan	Chippewa	2,497	Do.
Bay Port	do	Huron	3,956	Huron and Saint Clair.
Bellaire and Traverse city	do	Antrim and Grand Traverse	500	Michigan.

MARKETS FOR PRODUCTS OF THE GREAT LAKES FISHERIES—CONTINUED.

CITIES AND TOWNS.	States.	Counties.	Value.	Lakes from which taken.
Binghamton, New York, and Philadelphia.	New York and Pennsylvania	Broome, New York, and Philadelphia	\$743	Ontario.
Black River	Michigan	Alcona	283	Huron and Saint Clair.
Boonville, Chaumont, and Glendale	New York	Oncida, Jefferson, and Queens	67	Ontario.
Boston, Buffalo, and Dunkirk	Massachusetts and New York	Suffolk, Erie, and Chautauqua	10,150	Erie.
Bradford, Buffalo, and Westfield	Pennsylvania and New York	McKean, Erie, and Chautauqua	772	Do.
Bristol, Detroit, and Sandusky	New York, Michigan, and Ohio	Ontario, Wayne, and Erie	26,726	Huron and Saint Clair.
Bristol and New York	New York	Ontario and New York	2,727	Do.
Brockport and Leroy	do	Monroe and Genesee	2,425	Ontario.
Brocton	do	Chautauqua	100	Erie.
Buffalo	do	Erie	19,462	Erie and Ontario.
Buffalo and Chicago	New York and Illinois	Erie and Cook	820	Superior.
Buffalo, Chicago, and Cleveland	New York, Illinois, and Ohio	Erie, Cook, and Cuyahoga	70,616	Erie and Superior.
Buffalo, Chicago, and Sandusky	do	Erie, N. Y., Cook, and Erie, Ohio	19,530	Huron and Saint Clair.
Buffalo, Cincinnati, and Columbus	New York and Ohio	Erie, Hamilton, and Franklin	9,000	Erie.
Buffalo, Cincinnati, and Pittsburg	New York, Ohio, and Pennsylvania	Erie, Hamilton, and Allegheny	29,450	Do.
Buffalo, Cleveland, and Detroit	New York, Ohio, and Michigan	Erie, Cuyahoga, and Wayne	23,160	Huron and Saint Clair.
Buffalo, Cleveland, and Pittsburg	New York, Ohio, and Pennsylvania	Erie, Cuyahoga, and Allegheny	3,800	Erie.
Buffalo and Detroit	New York and Michigan	Erie and Wayne	1,938	Superior.
Buffalo, Detroit, and Hancock	do	Erie, Wayne, and Houghton	1,588	Do.
Buffalo, Elmira, and Syracuse	New York	Erie, Chemung, and Onondaga	1,745	Erie.
Buffalo and Erie	New York and Pennsylvania	Erie, N. Y., and Erie, Pa	2,967	Do.
Buffalo, Erie, and Pittsburg	do	Erie, N. Y., Erie, Pa., and Allegheny	3,425	Do.
Buffalo, Erie, and Sandusky	New York and Ohio	Erie, N. Y., Chautauqua, and Erie, Ohio.	2,240	Do.
Buffalo, Girard, and Pittsburg	New York, Ohio, and Pennsylvania	Erie, Trumbull, and Allegheny	675	Do.
Buffalo and Hancock	New York and Michigan	Erie and Houghton	700	Superior.
Buffalo, Hancock, and Ishpeming	do	Erie, Houghton, and Marquette	500	Do.
Buffalo and Irving	New York	Erie and Chautauqua	1,763	Erie.
Buffalo, Jamestown, and New York	do	Erie, Chautauqua, and New York	2,708	Do.
Buffalo, Jamestown, and Westfield	do	Erie and Chautauqua	1,000	Do.
Buffalo and New York	do	Erie and New York	3,569	Ontario.
Buffalo, New York, and Philadelphia	New York and Pennsylvania	Erie, New York, and Philadelphia	48,625	Erie.
Buffalo, New York, and Westfield	New York	Erie, New York, and Chautauqua	3,638	Do.
Buffalo, Philadelphia, and Pittsburg	New York and Pennsylvania	Erie, Philadelphia, and Allegheny	12,400	Do.
Buffalo, Pittsburg, and Syracuse	do	Erie, Allegheny, and Onondaga	1,863	Do.
Buffalo, Pittsburg, and Youngstown	do	Erie, Allegheny, and Niagara	4,655	Do.
Buffalo and Tonawanda	New York	Erie	1,467	Do.
Buffalo and West Hamburg	do	do	210	Do.
Canandaigua and Sedus Point	do	Ontario and Wayne	245	Ontario.
Cape Vincent	do	Jefferson	8,235	Do.
Cape Vincent and Chaumont	do	do	1,844	Do.
Cape Vincent, Chaumont, and Sackett Harbor.	do	do	2,543	Do.
Cape Vincent, Chaumont, and Three-Mile Bay.	do	do	390	Do.
Charlevoix and Petoskey	Michigan	Charlevoix and Emmet	900	Michigan.
Charlotte and Rochester	New York	Monroe	569	Ontario.
Chaumont	do	Jefferson	2,644	Do.
Chaumont and New York	do	Jefferson and New York	400	Do.
Chaumont and Sackett Harbor	do	Jefferson	300	Do.
Chaumont, Three-Mile Bay, and Watertown.	do	do	75	Do.
Cheboygan	Michigan	Cheboygan	5,266	Huron and Saint Clair.
Cheboygan and Chicago	Michigan and Illinois	Cheboygan and Cook	3,656	Do.
Chicago	Illinois	Cook	421,693	Superior, Michigan, Huron, and Saint Clair.
Chicago, Cincinnati, and New York	Illinois, Ohio, and New York	Cook, Hamilton, and New York	24,669	Erie.
Chicago, Cincinnati, and Philadelphia	Illinois, Ohio, and Pennsylvania	Cook, Hamilton, and Philadelphia	40,000	Do.
Chicago, Cincinnati, and Saint Louis	Illinois, Ohio, and Missouri	Cook, Hamilton, and Saint Louis	12,251	Do.
Chicago, Cleveland, and New York	Illinois, Ohio, and New York	Cook, Cuyahoga, and New York	6,500	Do.
Chicago and Detroit	Illinois and Michigan	Cook and Wayne	17,456	Superior, Michigan, Huron, and Saint Clair.
Chicago, Detroit, and Epoufette	do	Cook, Wayne, and Mackinac	5,813	Michigan.

MARKETS FOR PRODUCTS OF THE GREAT LAKES FISHERIES—CONTINUED.

CITIES AND TOWNS.	States.	Counties.	Value.	Lakes from which taken.
Chicago, Detroit, and Menekaunee.....	Illinois, Michigan, and Wisconsin	Cook, Wayne, and Marinette.....	\$939	Michigan.
Chicago, Detroit, and Sandusky.....	Illinois, Michigan, and Ohio.....	Cook, Wayne, and Erie.....	97,650	Huron and Saint Clair.
Chicago and Eagle Harbor.....	Illinois and Michigan.....	Cook and Keweenaw.....	107	Superior.
Chicago and Epoufette.....	do.....	Cook and Mackinac.....	824	Michigan.
Chicago and Escanaba.....	do.....	Cook and Delta.....	3,530	Do.
Chicago and Grand Rapids.....	do.....	Cook and Kent.....	9,184	Do.
Chicago, Grand Rapids, and Milwaukee.....	Illinois, Michigan, and Wisconsin.....	Cook, Kent, and Milwaukee.....	3,550	Do.
Chicago and Green Bay.....	Illinois and Wisconsin.....	Cook and Brown.....	17,581	Do.
Chicago, Green Bay, and Menekaunee.....	do.....	Cook, Brown, and Marinette.....	125	Do.
Chicago, Green Bay, and Oconto.....	do.....	Cook, Brown, and Oconto.....	3,217	Do.
Chicago, Green Bay, and Sturgeon Bay.....	do.....	Cook, Brown, and Door.....	19,574	Do.
Chicago, Indianapolis, and Saint Louis.....	Illinois, Indiana, and Missouri.....	Cook, Marion, and Saint Louis.....	23,482	Erie.
Chicago and Kalamazoo.....	Illinois and Michigan.....	Cook and Kalamazoo.....	150	Michigan.
Chicago and Lake Side.....	do.....	Cook and Berrien.....	242	Do.
Chicago and Laporte.....	Illinois and Indiana.....	Cook and Laporte.....	542	Do.
Chicago, Laporte, and Indianapolis.....	do.....	Cook, Laporte, and Marion.....	15,490	Do.
Chicago and Mackinaw city.....	Illinois and Michigan.....	Cook and Cheboygan.....	1,700	Do.
Chicago, Mackinaw city, and Petoskey.....	do.....	Cook, Cheboygan, and Emmet.....	2,000	Do.
Chicago and Manistique.....	do.....	Cook and Schoolcraft.....	1,970	Do.
Chicago, Manistique, and Saint James.....	do.....	Cook, Schoolcraft, and Manitow.....	1,400	Do.
Chicago and Menekaunee.....	Illinois and Wisconsin.....	Cook and Marinette.....	6,151	Do.
Chicago and Milwaukee.....	do.....	Cook and Milwaukee.....	18,022	Do.
Chicago, Milwaukee, and Sturgeon Bay.....	do.....	Cook, Milwaukee, and Door.....	569	Do.
Chicago, Minneapolis, and Saint Paul.....	Illinois and Minnesota.....	Cook, Hennepin, and Ramsey.....	781	Superior.
Chicago, New York, and Philadelphia.....	Illinois, New York, and Pennsylvania.....	Cook, New York, and Philadelphia.....	73,126	Erie.
Chicago and Oconto.....	Illinois and Wisconsin.....	Cook and Oconto.....	990	Michigan.
Chicago and Ontonagon.....	Illinois and Michigan.....	Cook and Ontonagon.....	1,370	Superior.
Chicago and Petoskey.....	do.....	Cook and Emmet.....	9,990	Michigan.
Chicago, Petoskey, and Saint James.....	do.....	Cook, Emmet, and Manitow.....	3,490	Do.
Chicago and Racine.....	Illinois and Wisconsin.....	Cook and Racine.....	7,000	Do.
Chicago and Saint Ignace.....	Illinois and Michigan.....	Cook and Mackinac.....	4,280	Do.
Chicago and Saint James.....	do.....	Cook and Manitow.....	7,200	Do.
Chicago and Saint Joseph.....	do.....	Cook and Berrien.....	4,706	Do.
Chicago and Sturgeon Bay.....	Illinois and Wisconsin.....	Cook and Door.....	6,406	Do.
Chicago and Traverse city.....	Illinois and Michigan.....	Cook and Grand Traverse.....	7,265	Do.
Chicago and Waukegan.....	Illinois.....	Cook and Lake.....	395	Do.
Cincinnati.....	Ohio.....	Hamilton.....	1,350	Erie.
Cincinnati and Cleveland.....	do.....	Hamilton and Cuyahoga.....	310	Do.
Cincinnati, Cleveland, and New York.....	Ohio and New York.....	Hamilton, Cuyahoga, and New York.....	14,220	Do.
Cincinnati, Cleveland, and Pittsburg.....	Ohio and Pennsylvania.....	Hamilton, Cuyahoga, and Allegheny.....	5,875	Do.
Cincinnati and Danville.....	Ohio and Illinois.....	Hamilton and Vermilion.....	6,545	Do.
Cincinnati, Louisville, and Pittsburg.....	Ohio, Kentucky, and Pennsylvania.....	Hamilton, Jefferson, and Allegheny.....	6,487	Do.
Cincinnati, New York, Philadelphia, and Pittsburg.....	Ohio, New York, and Pennsylvania.....	Hamilton, New York, Philadelphia, and Allegheny.....	15,300	Do.
Cincinnati, New York, and Pittsburg.....	do.....	Hamilton, New York, and Allegheny.....	35,601	Do.
Cincinnati, Philadelphia, and Pittsburg.....	Ohio and Pennsylvania.....	Hamilton, Philadelphia, and Allegheny.....	7,990	Do.
Cincinnati and Pittsburg.....	do.....	Hamilton and Allegheny.....	20,764	Erie, Huron, and Saint Clair.
Clayton, New York, and Watertown.....	New York.....	Jefferson and New York.....	250	Ontario.
Cleveland.....	Ohio.....	Cuyahoga.....	44,587	Erie.
Cleveland, Detroit, and Eagle Harbor.....	Ohio and Michigan.....	Cuyahoga, Wayne, and Keweenaw.....	323	Superior.
Cleveland and Erie.....	Ohio.....	Cuyahoga and Ottawa.....	1,120	Erie.
Cleveland and Fairport.....	do.....	Cuyahoga and Lake.....	1,100	Do.
Cleveland and New York.....	Ohio and New York.....	Cuyahoga and New York.....	10,005	Do.
Cleveland, Pittsburg, and Sandusky.....	Ohio and Pennsylvania.....	Cuyahoga, Allegheny, and Erie.....	15,003	Do.
Cleveland and Sandusky.....	Ohio.....	Cuyahoga and Erie.....	24,648	Do.
Cleveland and Vermillion.....	do.....	do.....	355	Do.
Conneaut and New York.....	Ohio and New York.....	Ashtabula and New York.....	500	Do.
Copper Harbor, Detroit, and Eagle Harbor.....	Michigan.....	Keweenaw and Wayne.....	190	Superior.
Covington and Sandusky.....	Kentucky and Ohio.....	Kenton and Erie.....	250	Erie.
Craig, Houghton, and Portage Entry.....	Michigan.....	Houghton.....	843	Superior.
Craig, Houghton, and Jacobsville.....	do.....	do.....	750	Do.
Craig and Jacobsville.....	do.....	do.....	120	Do.
Croghan.....	New York.....	Lewis.....	24	Ontario.

MARKETS FOR PRODUCTS OF THE GREAT LAKES FISHERIES—CONTINUED.

CITIES AND TOWNS.	States.	Counties.	Value.	Lakes from which taken.
Cross Village and Petoskey.....	Michigan.....	Emmet.....	\$30	Michigan.
Denver.....	Colorado.....	Arapahoe.....	6,000	Superior.
Derby and Irving.....	New York.....	Erie and Chautauqua.....	754	Erie.
Detour.....	Michigan.....	Chippewa.....	20,120	Huron and Saint Clair.
Detroit.....	do.....	Wayne.....	24,917	Superior, Michigan, Huron, Saint Clair, and Erie.
Detroit and Eagle River.....	do.....	Wayne and Keweenaw.....	444	Superior.
Detroit, Fort Wayne, and Sandusky.....	Michigan, Indiana, and Ohio.....	Wayne, Allen, and Erie.....	501	Huron and Saint Clair.
Detroit and Hancock.....	Michigan.....	Wayne and Houghton.....	900	Superior.
Detroit and Houghton.....	do.....	do.....	4,500	Do.
Detroit, Louisville, and Saint Louis.....	Michigan, Kentucky, and Missouri.....	Wayne, Jefferson, and Saint Louis.....	1,100	Erie.
Detroit and Mackinaw city.....	Michigan.....	Wayne and Cheboygan.....	2,160	Michigan.
Detroit, Mackinaw city, and Saint Ignace.....	do.....	Wayne, Cheboygan, and Mackinac.....	2,847	Huron and Saint Clair.
Detroit and Monroe.....	do.....	Wayne and Monroe.....	1,580	Do.
Detroit and New Baltimore.....	do.....	Wayne and Macomb.....	1,147	Do.
Detroit and Port Huron.....	do.....	Wayne and Saint Clair.....	10,273	Do.
Detroit and Rockwood.....	do.....	Wayne.....	1,103	Do.
Detroit and Sandusky.....	Michigan and Ohio.....	Wayne and Erie.....	2,115	Erie.
Dexter.....	New York.....	Jefferson.....	380	Ontario.
Dexter and Watertown.....	do.....	do.....	163	Do.
Duluth.....	Minnesota.....	Saint Louis.....	30,567	Superior.
Duluth and Fond du Lac.....	do.....	do.....	500	Do.
Duluth and Two Harbors.....	do.....	Saint Louis and Lake.....	240	Do.
Dunkirk.....	New York.....	Chautauqua.....	7,200	Erie.
Dunkirk and Erie.....	do.....	do.....	3,350	Do.
Dyckesville.....	Wisconsin.....	Keweenaw.....	130	Michigan.
Eastport and Norwood.....	Michigan.....	Antrim and Charlevoix.....	26	Do.
Elk Rapids.....	do.....	Antrim.....	347	Do.
Elk Rapids and Traverse city.....	do.....	Antrim and Grand Traverse.....	225	Do.
Ellisburg.....	New York.....	Jefferson.....	359	Ontario.
Ellisburg and New York.....	do.....	Jefferson and New York.....	200	Do.
Ellison Bay and Sturgeon Bay.....	Wisconsin.....	Door.....	50	Michigan.
Elmira.....	New York.....	Chemung.....	590	Ontario.
Elmira, Philadelphia, and Watkins Glen.....	New York and Pennsylvania.....	Chemung, Philadelphia, and Schuylcr.....	1,520	Do.
Erie.....	Ohio, Pennsylvania, and Michigan.....	Ottawa, Erie, and Monroe.....	68,406	Erie.
Erie and Girard.....	Pennsylvania.....	Erie.....	2,700	Do.
Erie and Sandusky.....	Pennsylvania and Ohio.....	Erie, Pa., and Erie, Ohio.....	6,450	Do.
Escanaba.....	Michigan.....	Delta.....	33,193	Michigan.
Escanaba and Ford River.....	do.....	do.....	1,780	Do.
Escanaba and Masonville.....	do.....	do.....	693	Do.
Escanaba and Ogontz.....	do.....	do.....	805	Do.
Evanston.....	Illinois.....	Cook.....	150	Do.
Fair Haven.....	Michigan.....	Saint Clair.....	1,838	Huron, Saint Clair, and Ontario.
Fairport and Vermillion.....	Ohio.....	Erie and Lake.....	1,000	Erie.
Ferrysburg and Grand Haven.....	Michigan.....	Ottawa.....	50	Michigan.
Ferrysburg and Holland.....	do.....	do.....	50	Do.
Fremont.....	Ohio.....	Sandusky.....	60	Huron and Saint Clair.
Geneva.....	do.....	Ashtabula.....	220	Erie.
Glenn.....	Michigan.....	Allegan.....	8	Michigan.
Grand Haven.....	do.....	Ottawa.....	160	Do.
Grand Haven and Grand Rapids.....	do.....	Ottawa and Kent.....	580	Do.
Grand Haven and Holland.....	do.....	Ottawa.....	155	Do.
Grand Haven and Spring Lake.....	do.....	do.....	160	Do.
Grand Rapids and Holland.....	do.....	Kent and Ottawa.....	450	Do.
Grand Rapids and Kalamazoo.....	do.....	Kent and Kalamazoo.....	3,900	Do.
Green Bay.....	Wisconsin.....	Brown.....	59,433	Do.
Green Bay and Menasha.....	do.....	Brown and Marinette.....	320	Do.
Green Bay, Milwaukee, and Sturgeon Bay.....	do.....	Brown, Milwaukee, and Door.....	4,710	Do.
Green Bay and Sturgeon Bay.....	do.....	Brown and Door.....	4,508	Do.
Grindstone city.....	Michigan.....	Huron.....	50	Huron and Saint Clair.
Hancock.....	do.....	Houghton.....	10	Superior.
Hancock and Houghton.....	do.....	do.....	425	Do.
Harbor.....	Ohio.....	Ashtabula.....	200	Erie.

MARKETS FOR PRODUCTS OF THE GREAT LAKES FISHERIES—CONTINUED.

CITIES AND TOWNS.	States.	Counties.	Value.	Lakes from which taken.
Harrisville	Michigan	Alcona	77	Huron and Saint Clair.
Henderson	New York	Jefferson	50	Ontario.
Holland	Michigan	Ottawa	297	Michigan.
Holland and Spring Lake	do	do	69	Do.
Houghton	do	Houghton	4,150	Superior.
Houghton and Portage Entry	do	do	738	Do.
Huron	Ohio	Erie	2,516	Huron, Saint Clair, and Erie.
Huron and New York	Ohio and New York	Erie and New York	2,500	Erie.
Huron, New York, and Pittsburg	Ohio, New York, and Pennsylvania	Erie, New York, and Allegheny	6,491	Do.
Huron and Richmond	Ohio	Erie and Jefferson	870	Do.
Illinois, Indiana, and Ohio	Illinois, Indiana, and Ohio		3,691	Do.
Imlay city and Saginaw	Michigan	Lapeer and Saginaw	479	Huron and Saint Clair.
Iosco	do	Livingston	90	Do.
Irving	New York	Chautauqua	3,957	Erie.
Jacobsville	Michigan	Houghton	48	Superior.
Kansas and Nebraska	Kansas and Nebraska		6,450	Do.
Kenosha	Wisconsin	Kenosha	16	Michigan.
Kewaunee	do	Kewaunee	200	Do.
Kingeville	Ohio	Ashtabula	51	Erie.
Lakeport	Michigan	Saint Clair	216	Huron and Saint Clair.
L'Anse	do	Baraga	1,127	Superior.
Leland	do	Leelanaw	59	Michigan.
Lexington	do	Sanilac	1,180	Huron and Saint Clair.
Little Sturgeon	Wisconsin	Door	183	Michigan.
Little Sturgeon and Sturgeon Bay	do	do	1,728	Do.
Lockport and New York	New York	Niagara and New York	2,222	Ontario.
Lorain	Ohio	Lorain	1,500	Erie.
Louisville, New York, and Philadelphia	Kentucky, New York, and Pennsylvania.	Jefferson, New York, and Philadelphia.	38,899	Do.
Ludington	Michigan	Mason	245	Michigan.
Ludington and Manistee	do	Mason and Manistee	97	Do.
Ludington and Muskegon	do	Mason and Muskegon	245	Do.
Ludington and Pentwater	do	Mason and Oceama	129	Do.
Mackinac Island	do	Mackinac	835	Huron and Saint Clair.
Mackinaw city	do	Cheboygan	11,216	Michigan, Huron, and Saint Clair.
Madison	Ohio	Lake	84	Erie.
Manistee	Michigan	Manistee	70	Michigan.
Manistee and Onecama	do	do	105	Do.
Manistique	do	Schoolcraft	16,424	Do.
Manistique and Nautinway	do	Schoolcraft and Mackinac	1,590	Do.
Marine city	do	Saint Clair	1,714	Huron and Saint Clair.
Marine city and Saint Clair	do	do	85	Do.
Marinette	Wisconsin	Marinette	1,394	Michigan.
Marinette and Menekaunee	do	do	1,254	Do.
Marinette, Menekaunee, and Menominee	Wisconsin and Michigan	Marinette and Menominee	131	Do.
Marinette and Menominee	do	do	69	Do.
Marquette	Michigan	Marquette	2,651	Superior.
Marquette and Sault de Ste. Marie	do	Marquette and Chippewa	1,094	Do.
Menekaunee	Wisconsin	Marinette	34,427	Michigan.
Menekaunee and Sturgeon Bay	do	Marinette and Door	673	Do.
Mentor	Ohio	Lake	169	Erie.
Mexico, Port Ontario, and Sandy Creek	New York	Oswego	574	Ontario.
Milwaukee	Wisconsin	Milwaukee	18,267	Michigan.
Monroe	Michigan	Monroe	1,076	Erie.
Monroe and Toledo	Michigan and Ohio	Monroe and Lucas	3,626	Do.
Montague	Michigan	Muskegon	35	Michigan.
Mount Clemens	do	Macomb	2,980	Huron and Saint Clair.
Munising	do	Alger	95	Superior.
Muskegon	do	Muskegon	540	Michigan.
Nautinway	do	Mackinac	293	Do.
New Baltimore	do	Macomb	281	Huron and Saint Clair.
New York	New York	New York	18,434	Erie and Ontario.
New York and Oswego	do	New York and Oswego	1,269	Ontario.

MARKETS FOR PRODUCTS OF THE GREAT LAKES FISHERIES—CONTINUED.

CITIES AND TOWNS.	States.	Counties.	Value.	Lakes from which taken.
New York and Philadelphia	New York and Pennsylvania	New York and Philadelphia	\$18,050	Erie.
New York, Philadelphia, and Pittsburg	do	New York, Philadelphia, and Allegheny.	59,012	Do.
New York, Philadelphia, and Saint Louis.	New York, Pennsylvania, and Missouri.	New York, Philadelphia, and Saint Louis.	10,036	Do.
New York and Pittsburg	New York and Pennsylvania	New York and Allegheny	5,002	Do.
New York and Port Ontario	New York	New York and Oswego	547	Ontario.
New York and Rochester	do	New York and Monroe	2,620	Do.
New York and Sandy Creek	do	New York and Oswego	763	Do.
New York and Syracuse	do	New York and Onondaga	5,000	Erie.
New York and Wilson	do	New York and Niagara	14,060	Ontario.
North Greece	do	Monroe	1,574	Do.
North Huron	do	Wayne	15	Do.
North Kingsville	Ohio	Ashtabula	150	Erie.
Northport	Michigan	Leelanaw	160	Michigan.
Northport and Saint James	do	Leelanaw and Manitou	2,400	Do.
Northport and Traverse city	do	Leelanaw and Grand Traverse	95	Do.
Northwestern states			15,400	Do.
Oconto	Wisconsin	Oconto	623	Do.
Olcott	New York	Niagara	150	Ontario.
Oscoda	Michigan	Iosco	58	Huron and Saint Clair.
Oskar	do	Houghton	75	Superior.
Oswego	New York	Oswego	7,302	Ontario.
Pentwater	Michigan	Oceana	25	Michigan.
Perry	Ohio	Lake	501	Erie.
Petoskey	Michigan	Emmet	17,269	Michigan.
Petoskey and Saint James	do	Emmet and Manitou	5,280	Do.
Port Austin	do	Huron	108	Huron and Saint Clair.
Port Crescent	do	do	100	Do.
Port Clinton	Ohio	Ottawa	10,435	Erie.
Port Clinton and Toledo	do	Ottawa and Lucas	1,865	Do.
Port Gratiot	Michigan	Saint Clair	450	Huron and Saint Clair.
Port Hope	do	Huron	92	Do.
Port Huron	do	Saint Clair	7,859	Do.
Port Huron and Sand Beach	do	Saint Clair and Huron	206	Do.
Port Ontario	New York	Oswego	1,892	Ontario.
Point Peninsula	do	Jefferson	476	Do.
Put-in-Bay	Ohio	Ottawa	325	Do.
Racine	Wisconsin	Racine	1,459	Michigan.
Red Jacket	Michigan	Houghton	816	Superior.
Richmond	Ohio	Jefferson	1,390	Erie.
Roberts Landing	Michigan	Saint Clair	35	Huron and Saint Clair.
Rochester	New York	Monroe	5,931	Ontario.
Rock Glen and Warsaw	do	Wyoming	550	Do.
Rogers city	Michigan	Presque Isle	148	Huron and Saint Clair.
Rome, Utica, and Watertown	New York	Oneida and Jefferson	750	Ontario.
Roseville	Michigan	Macomb	59	Huron and Saint Clair.
Sackett Harbor	New York	Jefferson	6,461	Ontario.
Sackett Harbor and Watertown	do	do	195	Do.
Saint Clair	Michigan	Saint Clair	1,511	Huron and Saint Clair.
Saint Helena Island	do	Mackinac	2,309	Michigan, Huron, and Saint Clair.
Saint Ignace	do	do	8,644	Do.
Saint James	do	Manitou	34,551	Michigan.
Sand Beach	do	Huron	731	Huron and Saint Clair.
Sandusky	Ohio	Erie	113,444	Erie.
Sandy Creek	New York	Oswego	530	Ontario.
Saugatuck	Michigan	Allegan	10	Michigan.
Sault de Ste. Marie	do	Chippewa	11,371 ^m	Superior, Huron, and Saint Clair.
Sebawaing	do	Huron	930	Huron and Saint Clair
Sheboygan	Wisconsin	Sheboygan	50	Michigan.
Sodus	New York	Wayne	65	Ontario.
Sodus Point	do	do	630	Do.

MARKETS FOR PRODUCTS OF THE GREAT LAKES FISHERIES—CONTINUED.

CITIES AND TOWNS.	States.	Counties.	Value.	Lakes from which taken.
Sturgeon Bay	Wisconsin	Door	\$12,000	Michigan.
Superior	do	Douglas	90	Superior.
Sutton's Bay	Michigan	Leelanaw	10	Michigan.
Syracuse	New York	Onondaga	615	Ontario.
Tawas city	Michigan	Iosco	240	Huron and Saint Clair.
Texas	New York	Oswego	78	Ontario.
Three-Mile Bay	do	Jefferson	80	Do.
Toledo	Ohio	Lucas	36,493	Erie.
Tonawanda	New York	Erie	1,080	Do.
Traverse city	Michigan	Grand Traverse	3,490	Michigan.
Two Harbors	Minnesota	Lake	740	Superior.
Two Rivers	Wisconsin	Manitowoc	13,452	Michigan.
Utica	Michigan	Macomb	317	Huron and Saint Clair.
Vermillion	Ohio	Erie	785	Erie.
Washington Harbor	Wisconsin	Door	60	Michigan.
Watertown	New York	Jefferson	120	Ontario.
West Hamburg	do	Erie	47	Erie.
Whitefish Point	Michigan	Chippewa	2,066	Superior.
Willoughby	Ohio	Lake	1,522	Erie.
Wilson	New York	Niagara	493	Ontario.
Yates	Michigan	Macomb	59	Huron and Saint Clair.
Youngstown	New York	Niagara	120	Ontario.

This table gives a graphic picture of the distribution of the fish when it leaves the hands of the fishermen. With its destination after reaching the hands of the dealers in the specified cities and towns we have nothing to do, for the inquiries of the special agents of the Census Office did not extend further than to ascertain the distribution of the product at what may be termed "first hands". In brief, the table represents trade only so far as it is directly controlled by the fishermen themselves.

VIII.—COMPARISONS—1880 AND 1889.

One of the principal uses of statistics is to supply facts by which comparisons can be made between different years or periods. No more fitting or valuable conclusion could be made to this bulletin than by bringing into juxtaposition the aggregates for the census years 1880 and 1889, and from these totals deducing the percentages of increase or decrease in 1889 as compared with 1880. This has been accomplished in the succeeding series of tables, one of which is devoted to each lake. The percentages of increase or decrease in 1889 as compared with 1880 are shown for each lake as regards persons employed, capital invested, and value of catch or product. Besides these principal points, comparative figures are given for twelve other points of information. The lakes are considered in their geographical order, commencing with Lake Superior, and at the end a combined table for all the lakes is presented.

COMPARISONS FOR 1880 AND 1889 OF LAKE SUPERIOR FISHERIES.

CLASSIFICATION.	1880.		1889.	
	Number.	Value.	Number.	Value.
Total capital invested		\$81,380		\$210,825
Persons employed.....	^a 369		789	
Steamers	4	9,400	9	27,350
Sailing vessels and boats, including stake boats or pile drivers.	157	16,840	475	30,568
Pound nets	43	14,950	210	36,810
Gill nets.....		25,280		72,624
Seines.....	32	2,010	36	3,094
Other apparatus		200		9,902
Shore property.....		12,709		630,477
	Pounds.	Value.	Pounds.	Value.
Total.....	3,816,625	\$118,370	7,883,949	\$280,807
Whitefish	2,257,000		3,898,558	166,572
Trout	1,464,750		3,366,724	112,516
Herring	34,000		382,123	5,002
Sturgeon			84,469	1,931
All other species.....	60,875		152,075	4,786

^aShoreshmen as reported by Tenth Census, not included.

^bIncluding \$1,734 other investments, as shown in table of "Capital invested".

The detail points of comparison for Lake Superior, as shown above, for 1880 and 1889, the same points and years being comprehended in the tables for each of the other lakes and also in the combined table for all lakes, are as follows: Number of persons employed; number and values of steamers, sailing vessels, and boats, including stake boats or pile drivers; number (when given) and value of pound nets, gill nets, and seines; value of other apparatus; value of shore property, including land, buildings, and wharves, and other investments, as shown in table of "Capital invested"; total capital invested; quantity and value (when given) of whitefish, trout, herring, sturgeon, all other species, and the total catch or product. In 1889, as compared with 1880, the number of persons employed had increased 113.82 per cent, the capital invested had increased 159.06 per cent, and the value of the catch or product 137.23 per cent.

COMPARISONS FOR 1880 AND 1889 OF LAKE MICHIGAN FISHERIES.

CLASSIFICATION.	1880.		1889.	
	Number.	Value.	Number.	Value.
Total capital invested		\$551,135		\$716,549
Persons employed.....	a1,436		2,084	
Steamers.....	30	63,400	47	158,400
Sailing vessels and boats, including stake boats or pile drivers.	506	69,975	1,226	69,115
Pound nets.....	476	155,425	856	171,146
Gill nets.....		124,740		184,742
Seines.....	19	2,040	48	4,489
Other apparatus.....		1,455		25,288
Shore property.....		104,109		3103,369
	Pounds.	Value.	Pounds.	Value.
Total.....	23,141,875	\$608,400	26,006,944	\$788,596
Whitefish.....	12,030,400		5,523,971	246,493
Trout.....	2,059,450		5,580,358	249,255
Herring.....	3,050,400		9,508,587	190,359
Sturgeon.....	3,839,600		612,353	26,634
All other species.....	1,562,025		4,721,675	75,795

a Shoresmen, as reported by Tenth Census, not included.

b Including \$20,498 other investments, as shown in table of "Capital invested".

The Lake Michigan fisheries show an increase as regards each of the three principal points considered, but the percentages are not so great as in the case of Lake Superior. The results are as follows: the increase in number of persons employed in 1889 as compared with 1880 was 45.13 per cent, in capital invested 30.01 per cent, and in value of output 17.97 per cent.

COMPARISONS FOR 1880 AND 1889 OF LAKES HURON AND SAINT CLAIR FISHERIES.

CLASSIFICATION.	1880.		1889.	
	Number.	Value.	Number.	Value.
Total capital invested		\$144,310		\$376,136
Persons employed.....	a732		1,444	
Steamers.....	5	10,000	9	28,200
Sailing vessels and boats, including stake boats or pile drivers.	158	18,905	739	28,917
Pound nets.....	189	48,425	755	123,818
Gill nets.....		21,680		43,116
Seines.....	70	11,600	49	4,091
Other apparatus.....		5,000		15,023
Shore property.....		27,700		6121,771
	Pounds.	Value.	Pounds.	Value.
Total.....	9,056,200	\$231,550	16,939,397	\$427,252
Whitefish.....	2,778,700		2,556,804	119,850
Trout.....	2,084,500		2,181,346	86,508
Herring.....	497,500		4,659,221	78,327
Sturgeon.....	1,202,500		656,909	19,400
All other species.....	2,493,000		6,885,657	123,167

a Shoresmen, as reported by Tenth Census, not included.

b Including \$3,606 other investments as shown in table of "Capital invested".

Lakes Huron and Saint Clair show more gratifying increases than Lake Michigan, though not reaching the percentages given for Lake Superior. The number of persons employed in 1889 was 97.27 per cent larger than in 1880. The capital invested increased 160.64 per cent and the value of the fish caught 84.52 per cent.

COMPARISONS FOR 1880 AND 1889 OF LAKE ERIE FISHERIES.

CLASSIFICATION.	1880.		1889.	
	Number.	Value.	Number.	Value.
Total capital invested		\$515, 100		\$1, 481, 733
Persons employed.....	a1, 369		2, 181	
Steamers	9	38, 400	42	143, 700
Sailing vessels and boats, including stake boats or pile drivers.	593	45, 480	1, 183	173, 606
Pound nets	755	233, 600	1, 838	483, 620
Gill nets		22, 500		94, 978
Seines	18	2, 800	34	2, 150
Other apparatus		8, 645		38, 982
Shore property		163, 675		6544, 397
	Pounds.	Value.	Pounds.	Value.
Total	29, 687, 300	\$474, 680	63, 563, 332	\$1, 033, 758
Whitefish	3, 333, 800		3, 323, 772	167, 172
Trout	26, 200		66, 703	3, 714
Herring	11, 774, 400		37, 200, 850	395, 171
Sturgeon	1, 970, 000		1, 244, 607	47, 045
All other species.....	11, 982, 900		21, 727, 400	420, 656

a Shoresmen, as reported by Tenth Census, not included.

b Including \$42, 427 other investments, as shown in table of "Capital invested".

As regards percentages of increase in 1889 as compared with 1880 the fisheries of Lake Erie approximate quite nearly to those for Lake Superior. The number of persons employed was 59.31 per cent greater in 1889 than in 1880. The capital invested was 187.66 per cent and the value of product 117.69 per cent greater.

COMPARISONS FOR 1880 AND 1889 OF LAKE ONTARIO FISHERIES.

CLASSIFICATION.	1880.		1889.	
	Number.	Value.	Number.	Value.
Total capital invested		\$54, 050		\$47, 716
Persons employed.....	a567		398	
Steamers	1	3, 600		
Sailing vessels and boats, including stake boats or pile drivers.	166	9, 500	253	13, 232
Pound nets and trap nets	34	14, 000	172	8, 225
Gill nets		20, 000		13, 337
Seines	9	1, 950	9	605
Other apparatus				7, 457
Shore property		5, 000		64, 800
	Pounds.	Value.	Pounds.	Value.
Total	3, 640, 000	\$159, 700	2, 691, 946	\$85, 431
Whitefish	1, 064, 000		23, 383	1, 476
Trout	569, 700		6, 500	511
Herring	611, 217		1, 850, 140	48, 202
Sturgeon	545, 283		200, 927	10, 925
All other species.....	849, 800		610, 996	24, 317

a Shoresmen, as reported by Tenth Census, not included.

b Including \$1, 886 other investments, as shown in table of "Capital invested".

Lake Ontario is the only one of the Great Lakes that shows a uniform falling off in the points under consideration. These results are due undoubtedly to the restrictive acts passed by the New York legislature to prevent commercial fishing in Lake Ontario, and the figures are conclusive evidence that this purpose has been largely accomplished. The decrease in the number of persons employed in 1889 as compared with 1880 was 32.20 per cent, in capital invested 11.72 per cent, and in the value of the catch 46.51 per cent, or very nearly one-half.

In the next table the points under consideration are aggregated for all the lakes, forming an "All Lakes" table.

COMPARISONS FOR 1880 AND 1889 OF ALL THE GREAT LAKES FISHERIES.

CLASSIFICATION.	1880.		1889.	
	Number.	Value.	Number.	Value.
Total capital invested -----		\$1,345,975		\$2,832,979
Persons employed -----	64,433		6,896	
Steamers -----	49	124,800	107	357,650
Sailing vessels and boats, including stake boats or pile drivers.	1,880	160,700	3,876	325,498
Pound nets -----	1,500	497,400	3,831	823,919
Gill nets -----		214,200		498,797
Seines -----	148	20,400	176	15,089
Other apparatus -----		15,309		87,252
Shore property -----		313,175		5894,814
	Pounds.	Value.	Pounds.	Value.
Total -----	68,742,000	\$1,652,909	117,085,568	\$2,615,784
Whitefish -----	21,463,900		15,326,483	651,503
Trout -----	6,804,600		11,201,631	452,504
Herring -----	15,967,517		53,600,921	717,061
Sturgeon -----	7,557,383		2,798,725	165,935
All other species -----	16,948,600		34,097,803	648,721

^a Shoresmen, as reported by Tenth Census, not included.

^b Including \$70,151 other investments, as shown in table of "Capital invested".

The figures for "All the Great Lakes" are most gratifying both as regards the material conditions and results and as an indication of the completeness of the work done by the agents of the Census Office. Considering all lakes, the increase in persons employed in 1889 as compared with 1880 was 53.48 per cent, or more than one-half, in capital invested, 110.48 per cent, or more than double, and in value of catch, 58.25 per cent, or very nearly three-fifths.

The following table has been prepared in order to allow of comparisons being made easily between the percentages of increase or decrease for each of the lakes and for all lakes:

LAKES.	PERCENTAGES OF INCREASE IN 1889 AS COMPARED WITH 1880.		
	Number of persons employed.	Amount of capital invested.	Value of product.
All lakes -----	53.48	110.48	58.25
Superior -----	113.82	159.06	137.23
Michigan -----	45.13	30.01	17.97
Huron and Saint Clair -----	97.27	160.04	84.52
Erie -----	59.31	187.66	117.69
Ontario -----	32.20	11.72	46.51

^a Decrease.